CLALLAM COUNTY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

G&O #18486
OCTOBER 2018

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CLALLAM COUNTY

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CHAPTER 1

INTRODUCTION

This *General Sewer/Wastewater Facilities Plan* (*Plan*) for the communities of Clallam Bay and Sekiu addresses the County's planning needs for wastewater collection, transmission, treatment, and disposal for the 20-year planning period. Clallam County owns and operates the community's wastewater collection and treatment systems. This Plan was prepared in accordance with the provisions of the Revised Code of Washington (RCW) Section 90.48, *Water Pollution Control*, Washington Administrative Code (WAC) Section 173-240-050, *General Sewer Plan*, WAC 173-240-060, *Engineering Report* and 40 CFR Part 35 *(Facility Plan)*. Development of the Plan has been coordinated with the Clallam County *Comprehensive Plan*, and with the Clallam County PUD *Draft 2017 Water System Plan*.

The Plan provides proposed conceptual designs, cost estimates, schedule, and financing plan for recommended facility improvements. A State Environmental Policy Act (SEPA) checklist is provided in Appendix A. The projects described in the Plan are consistent with Washington State regulations relating to the prevention and control of discharge of pollutants into waters of the state, anti-degradation of existing and future beneficial uses of groundwater, and anti-degradation of surface water. No adopted water quality plans pursuant to the Federal Water Pollution Control Act exist for the receiving water, nor are there other adopted plans which Ecology and the County have entered into under the Clean Water Act. In 2009, a draft WRIA 19 (Hoko-Lyre) Watershed Plan was compiled; however, stakeholders could not agree to the instream flow regulations as well as the riparian buffers being proposed so this plan was never adopted.

The Clallam Bay and Sekiu communities are located along Highway 112 within Clallam County along the Strait of Juan de Fuca in the northwest portion of Washington State (see Figure 1-1).

SCOPE OF WORK

The Plan addresses the wastewater collection system and the wastewater treatment system for both Clallam Bay and Sekiu. This evaluation includes collection system / wastewater treatment plant analysis, a capital improvement plan and a cost analysis with an associated schedule. The scope of work for the Plan includes the following items:

- Chapter 1 – Introduction
- Chapter 2 – Land Use, Population Projections, and Service Area Characteristics
- Chapter 3 – Regulatory Requirements
- Chapter 4 – Existing Facilities

- Chapter 5 – Wastewater Flow Projections and Design Criteria
- Chapter 6 – Collection System Analysis and Infiltration/Inflow Study
- Chapter 7 – Wastewater Treatment System Analysis
- Chapter 8 – Capital Improvement Plan
- Chapter 9 – Financial Plan
- Appendix

RELATED PLANNING DOCUMENTS

The following documents were consulted in the preparation of this Plan:

GROWTH MANAGEMENT ACT (GMA) RELATED PLANS, POLICIES AND DEVELOPMENT REGULATIONS

Clallam County Comprehensive Plan (CCC 31), Clallam County, 2007.

The Clallam County Comprehensive Plan was originally created in 1967 and was most recently updated in 2007. The Clallam County Comprehensive Plan addresses land use, transportation, housing, environment and open space, historic and cultural resources, economic development, and public facilities. The Comprehensive Plan provides:

- Policies and recommendations to direct public and private decisions affecting future growth and development;

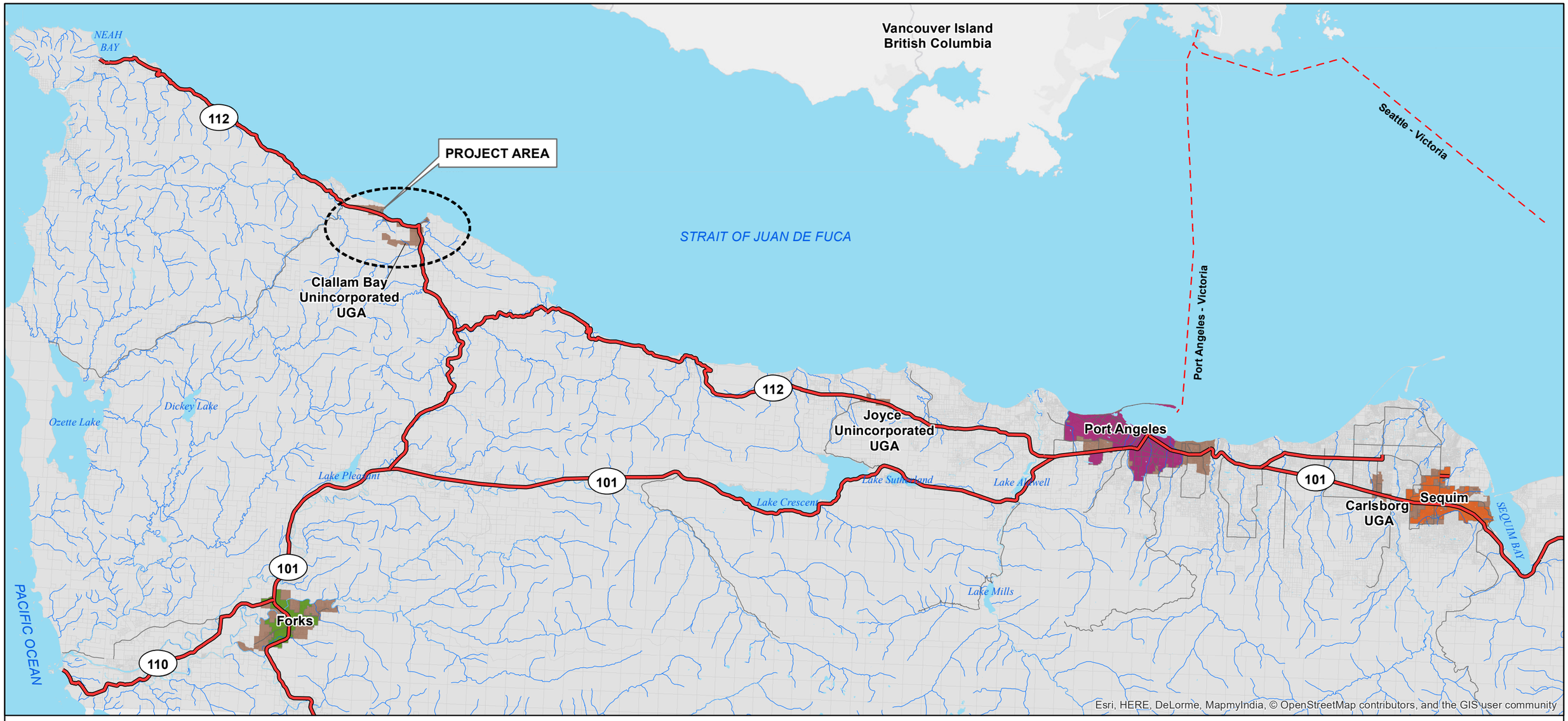
- A framework of goals and policies adaptable to the changing attitudes and resources of the region;

- A long-range vision, based on community values and goals, of how citizens want the County to look and function in the future as well as guidance for achieving that vision; and

- Guidelines for making decisions on growth, land use, transportation, public facilities and services, parks, and open space.

Clallam County's Urban Growth Area Analysis and 10-Year Review, Clallam County, 2007.

The Urban Growth Area (UGA) Analysis was performed as the County's regulated 10-year review of its six designated UGAs. The UGA Analysis assesses land densities to allow for future growth. Growth trends and anticipated population growth characteristics are discussed for the six UGAs including the 1,412 acre Clallam Bay –Sekiu UGA. The Analysis noted that this UGA had a 2006 population of 1,271 people and an average of three residential building permits per year preceding 2006. The UGA has a history of



N

0 2.5 5 10 Miles

LEGEND

- REGIONAL HIGHWAY
- MAJOR ROAD
- RIVER
- WATERBODY
- PARCEL
- FORKS
- PORT ANGELES
- SEQUIM
- UNINCORPORATED URBAN GROWTH AREA

CLALLAM BAY/SEKIU
GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 1-1
VICINITY MAP

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jobs associated with timber and fishing; however, in the past three decades, these industries have declined. The UGA was created in 1995 to allow for limited urban services such as an airport, school, community center, lodging and food. The Report also notes that the area is serviced by the Clallam County Public Utility District (PUD) for water and by Clallam County for sewer. It notes that two sewer systems were constructed in 1975 (operational in 1977) due to the landslide potential in an unstable area separating the two communities and that both treatment plans "have significant treatment capacity".

The UGA Analysis reported that the UGA consisted of 46 percent single-family residential areas, 18 percent multi-family residential areas, 23 percent manufactured home areas, 12 percent mobile home parks and 0.3 percent commercial areas. A total of 337 dwelling units existed in 2006 alongside 274 developed commercial acres. The County growth population projection originally included escalating from 435 people in 2006 to 777 people by 2010. However, further in the Analysis, the County notes that the UGA decreased in population between 2000 and 2006 but "with the recent interest in Clallam Bay - Sekiu area as a more affordable retirement area, the county continues to encourage and plan for increased growth since there is infrastructure capacity available." Therefore, the County anticipated a 1 percent annual growth rate. The 2025 population was predicted to be 536 people and 2.2887 people were anticipated per household. As further discussed in Chapter 2, the Washington State Office of Financial Management has more current population projections which are used for the purpose of this Plan.

The UGA's future land use includes an Urban Residential High (URH) zone with a maximum allowed density of 3.5 du/acre and an Urban Center (UC) land use designation that allows 6 to 9.6 du/acre. The Report notes that due to the landslide hazard within the UGA, the amount of currently vacant land available for residential development was decreased by 50 percent within the UGA limits.

Clallam County Shorelines Master Program, Clallam County, 1976.

Clallam County adopted the Shoreline Master Plan (SMP) in 1976 and was updated in 1992. This program was developed to ensure the utilization, protection, restoration, and preservation of the County's shorelines. The County is currently updating the Shoreline Master Program and made a draft plan available in September 2017. Additional policies pertaining to utilities within shoreline areas include Clallam County Code (CCC) 35.01 Shoreline Management and CCC 27.12 Critical Areas.

WASTEWATER SYSTEM PLANNING

Sekiu – Clallam Bay Sewerage General Plan, August 1972, Kennedy Engineers

This Plan was formed to provide a solution to the lack of a public sanitary sewer system. The purpose of the Plan was to alleviate existing pollution and health hazards, protect water quality of nearby surface waters, implement a program for a community sewer

system, develop a concept for the development of an area-wide sewerage plan and to provide a more reliable system for liquid waste disposal in lieu of the historic practice of septic tanks that disposed waste to the storm systems. The report analyzed potential options to address these issues including installing one to three treatment plans. The Plan did not appear to provide a clear recommendation of the three alternatives but was more of a presentation of the benefits and disadvantages of the treatment alternatives and their associated costs. However, following completion of this Plan, separate rotating biological contactor (RBC) WWTPs for Clallam Bay and Sekiu were constructed.

Clallam Bay and Sekiu Wastewater Treatment Plants Expansion and Upgrading, Ten Percent Design Report, May 1985, Culp, Wesner, Culp Consulting Engineers

The purpose of this document was to evaluate and select the most cost-effective method for upgrading and expanding the secondary treatment capacity of the Sekiu and Clallam Bay plants. This was driven by the fact that the biological process utilizing the RBCs failed to meet design standards and were not in operation since 1978. The County had requested a waiver from Ecology to be excluded from the secondary treatment standards but the waiver was denied. The treatment alternatives analyzed included attached growth systems (RBCs and biotowers), and suspended growth systems (activated sludge and ICEAS, an advanced sequencing batch reactor). The selected alternative was to replace the existing RBC units with new units. Preliminary design layouts and a schedule were provided.

Infiltration/Inflow Analysis for Clallam Bay and Sekiu Utility Improvement District, HDR Engineering, Inc., March 1990

This analysis discussed the issue of both the Clallam Bay and Sekiu wastewater treatment plants receiving substantial amounts of inflow/infiltration (I/I). The report noted that based on a 1985 Report, the average I/I contribution in 1983 to 1984 was 112 to 132 gallons per capita per day (or 23,100 gallons per day) to the Sekiu Plant and 185 gallons per capita per day (or 64,750 gpd) to the Clallam Bay Plant. Analysis of the I/I system included flow metering, observation of select manholes, analysis of flow records at the treatment plants and analysis of pump run time data for the individual lift stations. The analysis concluded that the Muralt's Trailer Park was a major contributor to the Clallam Bay system and that the Bayview Trailer and RV Park, Coho Resort, Middle Point Resort and the reach along Front Street were major contributors of I/I within the Sekiu system. The report estimated that approximately 70,000 gpd could be removed from the Clallam Bay system and that 76,000 gpd could be removed from the Sekiu system. Rehabilitation methods included sliplining pipes, replacing/repairing service connections, and in-place grouting of leaks. It was recommended that the County continue to monitor I/I.

WATER SYSTEM COMPREHENSIVE PLANS

Clallam County Water System Plan Update, April 2017

The *Clallam County Water System Plan Update* discusses the existing six Group A water system facilities the PUD maintains, water usage and design criteria, conservation programs, system expansion, and water system improvements. The Plan notes that water demand within the Clallam Bay – Sekiu area is anticipated to stay approximately the same. The average day demand between 2010 and 2014 was 114 gpd/ERU and the forecasted average day demand beyond 2014 is anticipated to be 115 gpd/ERU. Similar to the UGA analysis, the Water System Plan Update anticipates a 1 percent annual growth rate for the Clallam Bay and Sekiu communities.

CHAPTER 2

LAND USE, POPULATION PROJECTIONS, AND SERVICE AREA CHARACTERISTICS

The Clallam Bay and Sekiu communities are located in Clallam County, about 50 miles west of the City of Port Angeles. Located along State Route 112, Clallam Bay and Sekiu lie along the Strait of Juan de Fuca (see Figure 1-1).

SEWER SERVICE AREAS

The Clallam Bay and Sekiu communities have their own designated sewer service areas. Due to landslide potential, two separate wastewater treatment plants (WWTP) were constructed, one to serve Sekiu and one to serve Clallam Bay. All wastewater is treated at the Clallam Bay or Sekiu WWTP.

CLALLAM BAY AND SEKIU

The current sewer service area within the Clallam Bay – Sekiu UGA is shown in Figures 2-1 and 2-2. Per billing records, the Clallam Bay and Sekiu current sewer service areas include approximately 97 acres within Sekiu and 77 acres within Clallam Bay. The current sewer service area shown in these figures represents the original ULID delineation created at the time the sewer mains and treatment plants were constructed. This ULID area is completely within the UGA boundary. Currently, County ordinances require any parcel located outside of the sewer service area (but within the UGA boundary) to pay twice the connection fee of parcels designated within the service area. The collection systems within Sekiu and Clallam Bay are primarily conventional gravity sewer systems. The Clallam Bay system consists of an estimated 15,915 feet of mainline gravity sewers and approximately 3,440 feet of force main with two lift stations. The Sekiu system consists of an estimated 18,277 feet of mainline gravity sewers and approximately 9,017 feet of force main with 5 lift stations.

ADJACENT SEWER SERVICE AREAS

There are no adjacent sewer systems to the Clallam Bay - Sekiu systems. The nearest known municipal sewer system is in the City of Forks, 28 miles away. The Washington State Department of Corrections provides an isolated sanitary sewer system for the Clallam Bay Corrections Facility, just south of Clallam Bay. The Corrections Facility has its own treatment plant which discharges into a shared outfall pipe with the Sekiu WWTP.

NATURAL ENVIRONMENT

TOPOGRAPHY

Elevations in the Clallam Bay area range from sea level in the north portion of the UGA to 160 feet in the southern portion of the UGA. Likewise, elevations in the Sekiu area range from sea level to 240 feet on the east end of the UGA and 200 feet on the west end. The topography in both areas generally flows from the higher elevations in the south toward the north where it meets Clallam Bay. Slopes range between 9 and 16 percent in the Clallam Bay area, with the steeper slopes lying in the south, naturally draining surface water toward Clallam Bay to the north. Within Sekiu, slopes range between 7 and 35 percent with the steeper slopes existing near Clallam Bay.

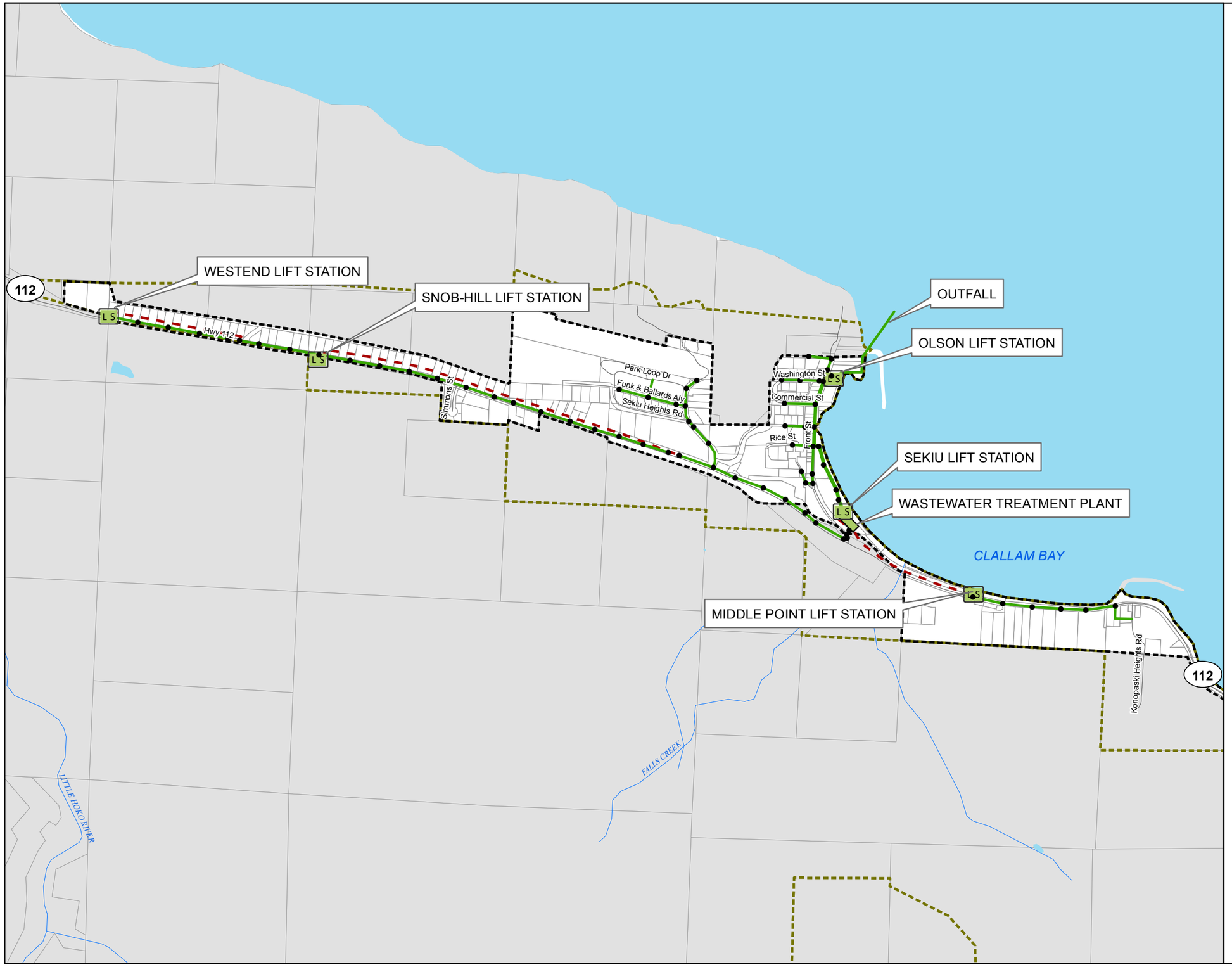
Figures 2-3 and 2-4 are topographic maps based on United States Geologic Survey (USGS) showing the varying elevations within the two sewer service areas.

SOILS AND GEOLOGY

The primary soil types in the Clallam Bay and Sekiu areas are silt loam and loam, respectively. Per the USDA Natural Resources Conservation Service website, Clallam Bay consists of mostly Klahowya silt loam ranging in 5 to 35 percent slopes. This type of soil is considered a Type C soil and is moderately well drained. Soils in the Sekiu vicinity consist of predominantly Palix loam (65 to 90 percent slopes) and Klahowya silt loam (5 to 35 percent slopes) with a small area of loam in the southern portion of the UGA. Palix loam is well drained and is classified as a Type B soil. More detailed locations of these soils are shown in Figures 2-5 and 2-6.

CLIMATE

The nearest major NOAA weather station is in the vicinity of Forks, known as the "Quillayute Area" meter which is located approximately 28 miles from the Clallam Bay – Sekiu region. Table 2-1 provides precipitation data for 2008 through 2017 from this weather station.



N

0 625 1,250 2,500 Feet

LEGEND

- SEWER MANHOLE
- GRAVITY SEWER PIPE
- FORCE MAIN
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-1
SEWER SERVICE AREA (SEKIU)

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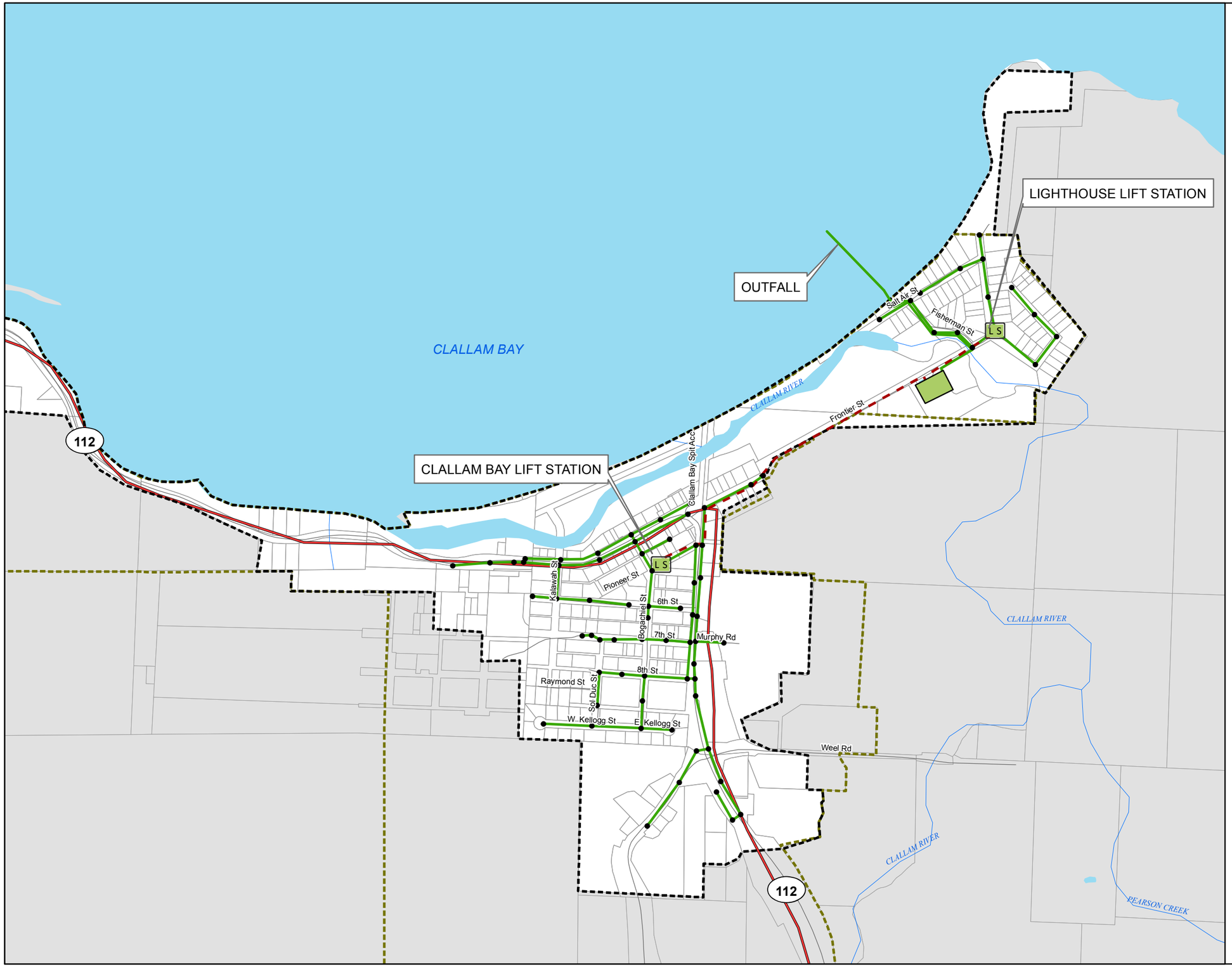

N

0 375 750 1,500 Feet

LEGEND

- SEWER MANHOLE
- GRAVITY SEWER PIPE
- FORCE MAIN
- REGIONAL HIGHWAY
- L S LIFT STATION
- WASTEWATER TREATMENT PLANT
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-2
SEWER SERVICE AREA (CLALLAM BAY)

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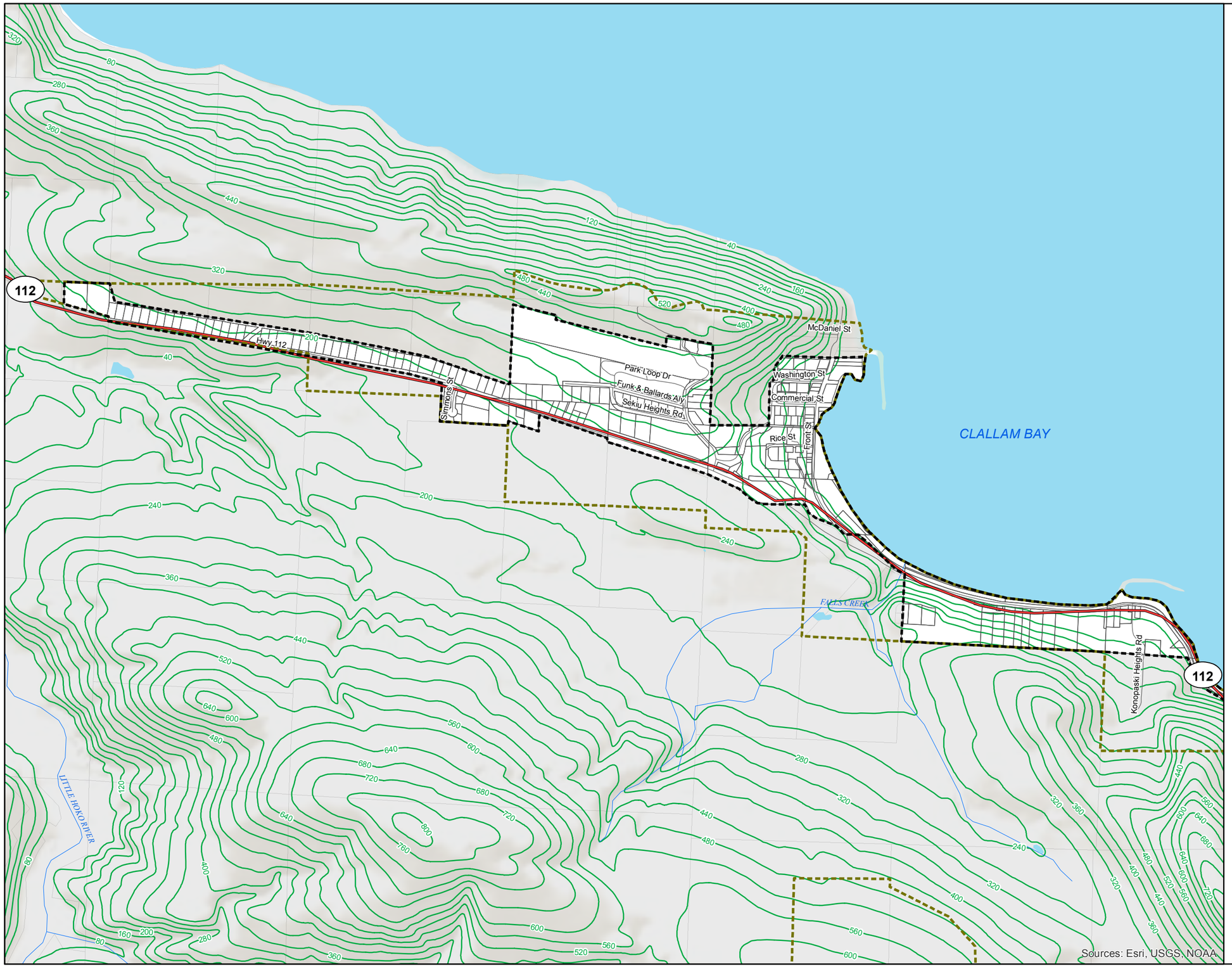

N

0 625 1,250 2,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- 40FT CONTOUR
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-3
TOPOGRAPHY (SEKIU)

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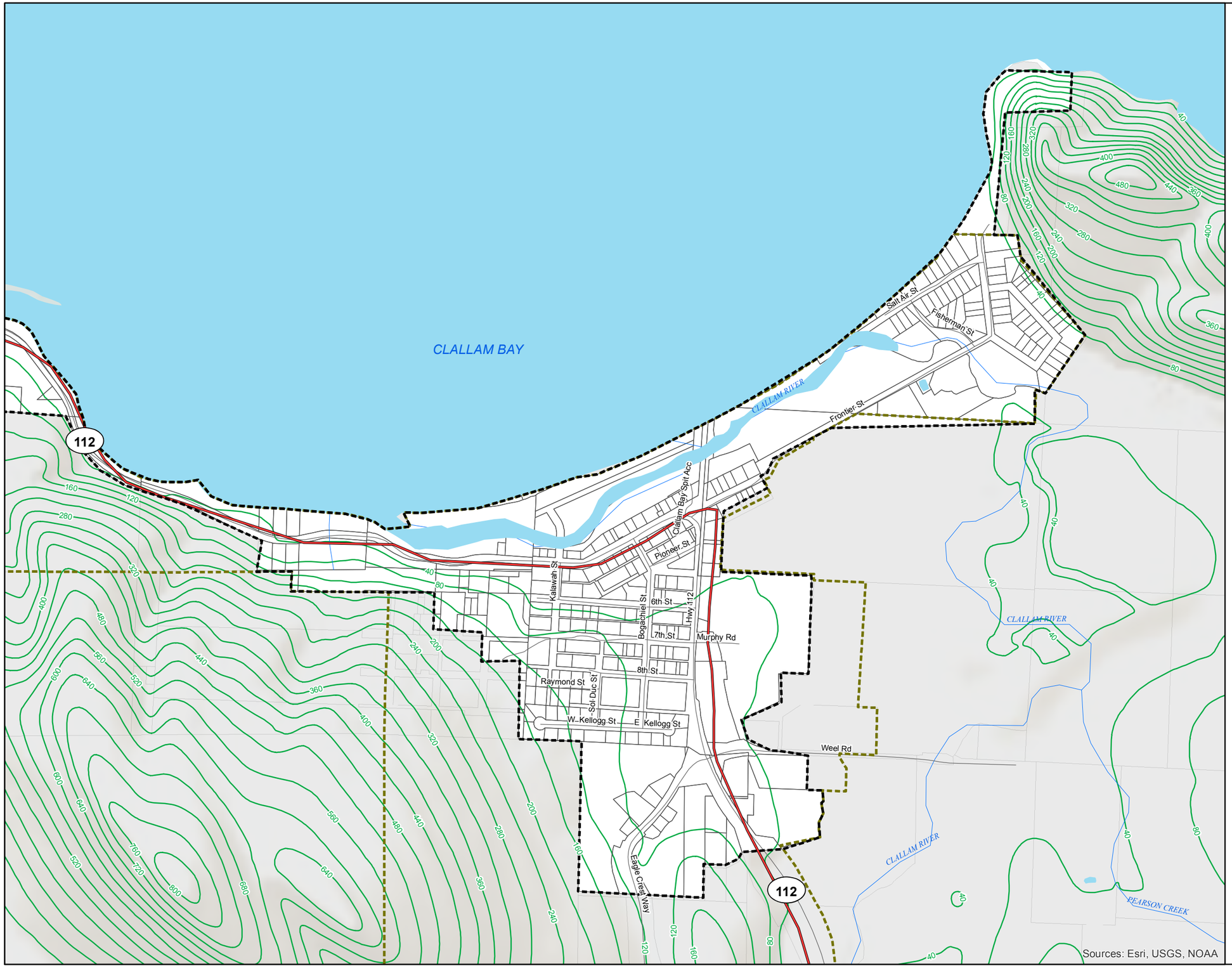

N

0 375 750 1,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- 40FT CONTOUR
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-4
TOPOGRAPHY (CLALLAM BAY)

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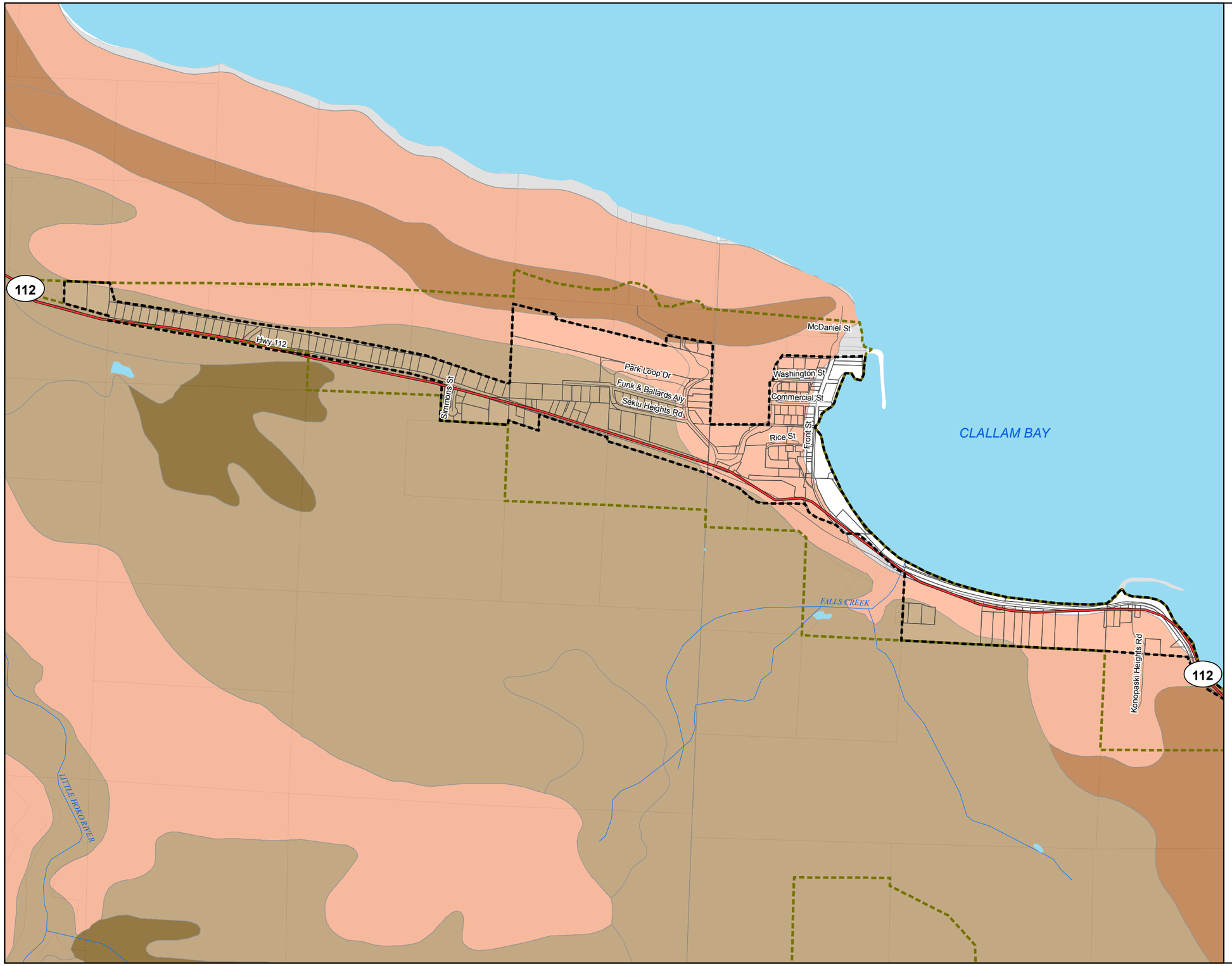

N

0 625 1,250 2,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

SOILS

- GRAVELLY SILT LOAM
- LOAM
- SILT LOAM
- VERY GRAVELLY LOAM
- UNKNOWN

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-5
SOILS (SEKIU)

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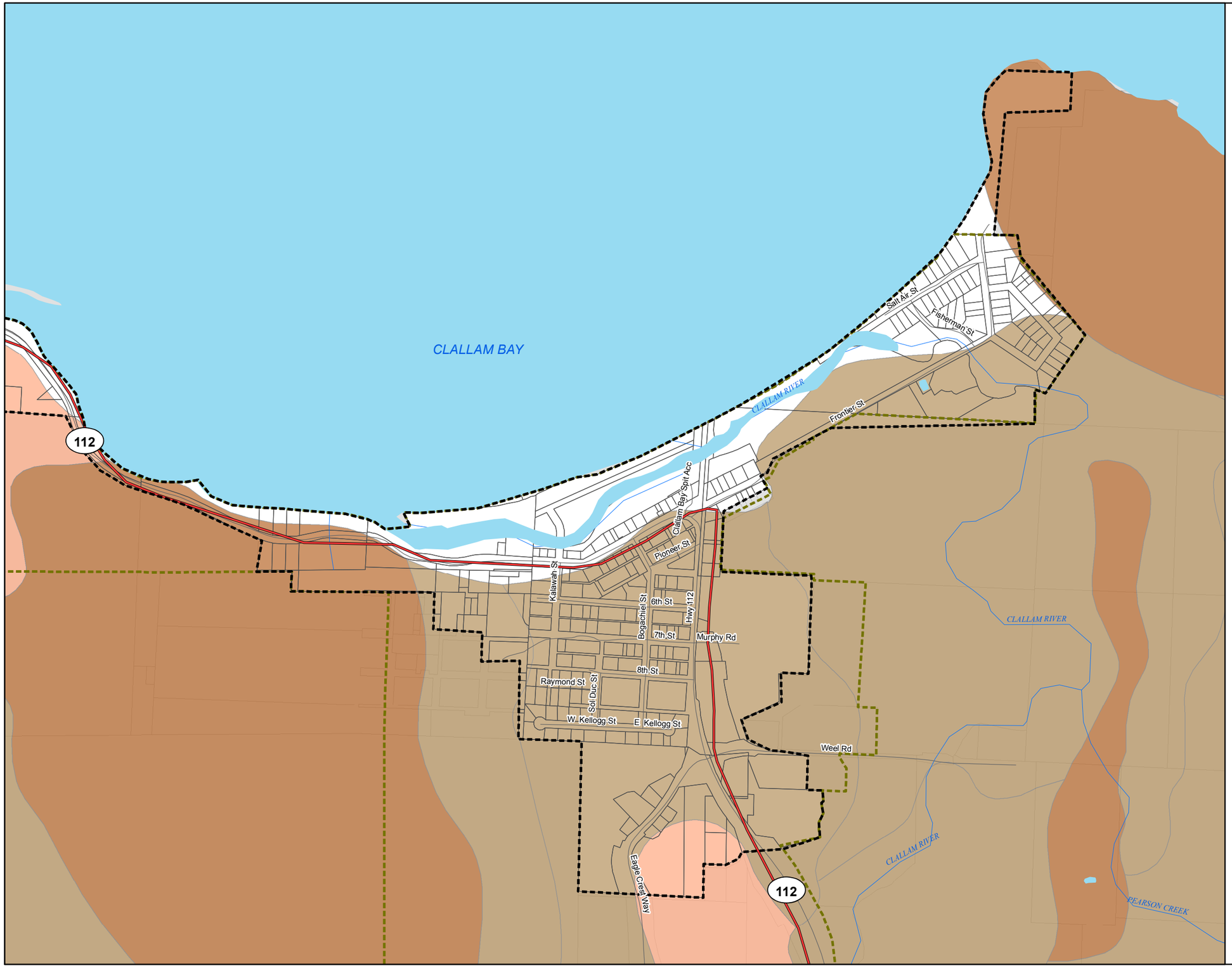

N

Feet

0 375 750 1,500

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE
- UGA BOUNDARY
- PARCEL
- WATERBODY

SOILS

- GRAVELLY SILT LOAM
- LOAM
- SILT LOAM
- VERY GRAVELLY LOAM
- UNKNOWN

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-6
SOILS (CLALLAM BAY)

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TABLE 2-1

Quillayute Area Total Precipitation 2008 through 2017 (inches)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
2008	12.02	7.92	8.58	--	2.33	2.70	2.69	5.73	1.67	8.28	17.83	11.18	80.93
2009	11.16	3.22	9.36	4.94	4.32	1.02	1.04	1.54	5.77	12.27	26.55	6.91	88.10
2010	22.54	7.18	9.79	10.11	8.12	4.30	0.35	2.90	8.85	12.28	12.33	19.02	117.77
2011	17.58	10.47	17.95	7.84	5.56	1.87	2.28	3.27	7.68	10.39	14.54	7.90	107.33
2012	15.59	11.40	21.00	10.29	4.26	7.00	1.93	0.52	0.57	15.60	13.84	17.53	119.53
2013	10.30	11.76	15.99	10.93	6.87	2.90	0.01	3.01	9.59	3.15	7.92	6.16	88.59
2014	11.93	10.64	15.81	9.90	3.91	2.15	0.82	0.69	4.55	17.36	13.18	14.21	105.15
2015	11.53	8.30	14.71	6.19	0.67	0.20	0.97	4.05	6.22	9.78	14.96	19.24	96.82
2016	15.72	15.74	15.84	2.21	2.32	3.52	2.17	0.67	4.18	21.08	25.72	13.13	122.30
2017	8.28	11.77	22.97	14.43	5.15	4.30	0.24	0.46	3.79	7.26	19.91	11.05	109.61
Mean	13.67	9.84	15.20	8.54	4.35	3.00	1.25	2.28	5.29	11.75	16.68	12.63	106.13
Max	22.54	15.74	22.97	14.43	8.12	7.00	2.69	5.73	9.59	21.08	26.55	19.24	122.30
Min	8.28	3.22	8.58	2.21	0.67	0.20	0.01	0.46	0.57	3.15	7.92	6.16	88.10

Source: NOAA National Weather Service Forecast, http://w2.weather.gov/climate/xmacis.php?wfo=sew .

The precipitation data from the Quillayute weather station is a reasonably accurate representation of the precipitation that the Clallam Bay – Sekiu area experiences. The station experienced a 10-year annual average precipitation of 106 inches. The maximum monthly precipitation for the area over the past 10 years was 26.6 inches and occurred in November 2009. The minimum monthly precipitation over the 10-year period at the Quillayute weather station was 0.01 inch, seen in July 2013.

SITE SENSITIVE AREAS

The following section summarizes information regarding site-sensitive/critical areas presented in the Clallam County Critical Areas Code, CCC 27.12. This section of the code provides protection to site-sensitive areas. Critical areas within the sewer service area include those classified as streams and watercourses, wetlands, frequently flooded areas, critical aquifer recharge areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. The codes states the following, in regard to goals for environmental preservation and conservation:

> *Conserve and protect the environmental attributes of Clallam County that contribute to the quality of life for residents of both Clallam County and the State of Washington.*

Policies implemented by the County to meet this goal include encouraging developments to be located away from environmentally sensitive areas, encouraging open space buffers, compliance with SEPA and the Shorelines Management Act, and planning and development review.

A critical area goal of the County Comprehensive Plan states the following:

> *Protect the environment and enhance the State's high quality of life, including air and water quality, and the availability of water.*

The following plans and regulations were prepared for the protection of the natural environment within Clallam County:

- Clallam County Comprehensive Plan, 2007
- Clallam County Critical Areas Code, Title 27.12

The site-sensitive areas within the sewer service areas are described further below.

Surface Water

Lakes and streams are classified as sensitive areas due to the variety of plants and animals that they support. The streams and rivers around the Clallam Bay – Sekiu region include Falls Creek which flows through Sekiu and the Clallam River which flows through Clallam Bay. These watercourses drain into Clallam Bay located along the Strait of Juan de Fuca.

Wetlands

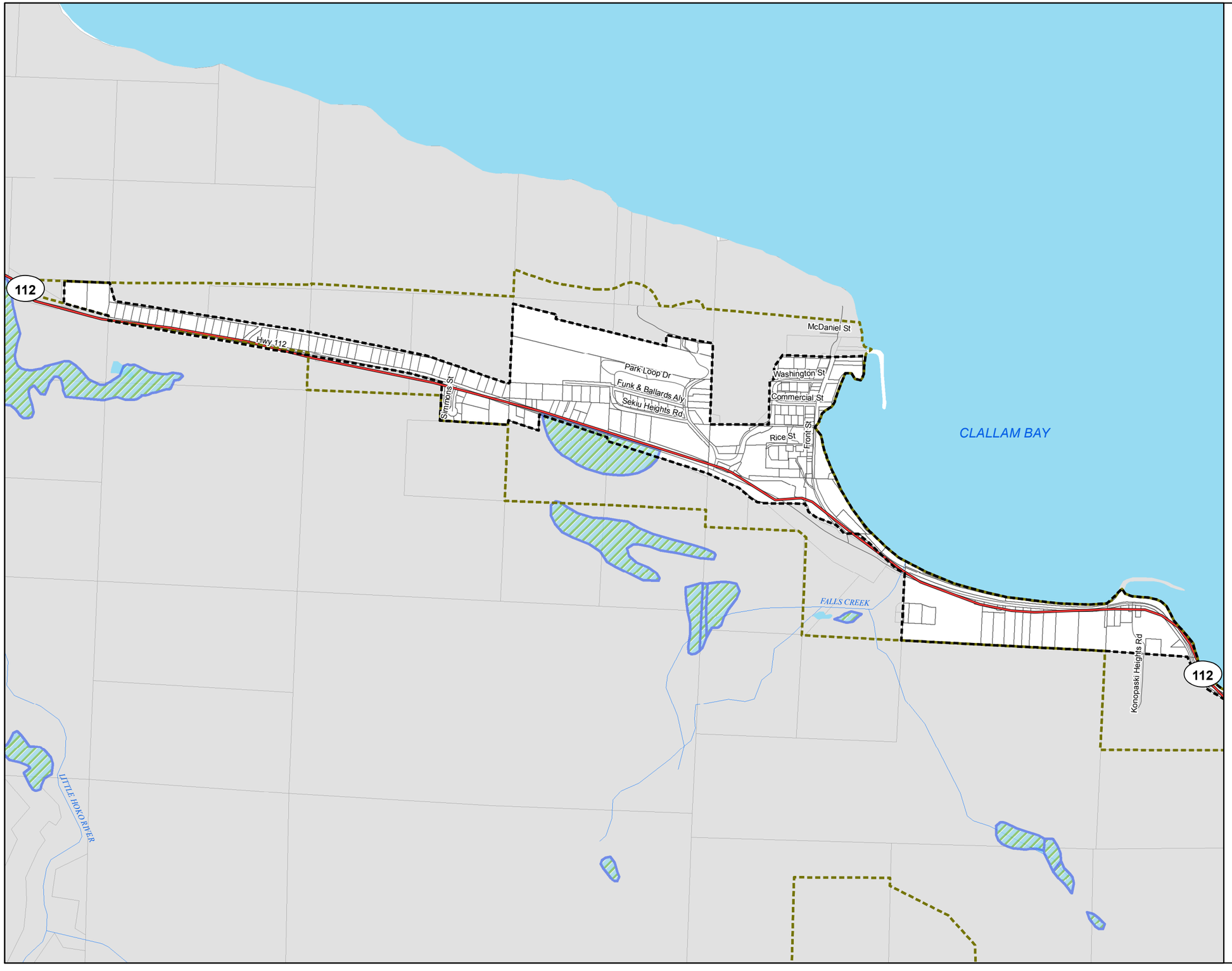
The Growth Management Act defines wetlands as areas that have surface or ground water that supports vegetation typically adapted in saturated soil conditions. Wetlands are fully classified in Clallam County Code Section 27.12.210. Wetlands support valuable and complex ecosystems and consequently, development is severely restricted if not prohibited in most wetlands and wetland buffers. There is approximately 1 acre of wetlands located inland of Clallam Bay, within the sewer service area. Figures 2-7 and 2-8 show wetland areas within the vicinity of the Clallam Bay – Sekiu region.

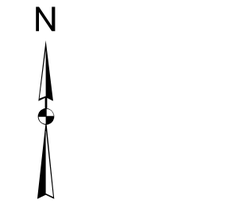
Frequently Flooded Areas

Flood hazard areas are areas adjacent to lakes, rivers, and streams that are prone to flooding during peak runoff periods. Construction of buildings and other development in these areas is regulated in accordance with flood hazard zoning defined in the Clallam County Code Section 27.12.505. The 100-year flood zones (land that has a 1 percent chance of flooding each year) are depicted in Figures 2-9 and 2-10. In addition to flooding from peak runoff, increasing sea level rise is also a concern and should be considered when placing critical infrastructure such as wastewater treatment facilities.

Critical Aquifer Recharge Areas

Aquifer recharge areas are areas that have a critical effect on aquifers used for potable water as defined by WAC 365-190-030(2). The Clallam Bay and Sekiu water systems





LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY
- WETLAND

NOTE: Wetland data was compiled by Clallam County from a variety of orginal source data including the National Wetland Inventory, Environmental Protection Agency special study, and other wetland studies.

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-7
WETLANDS (SEKIU)

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CLALLAM BAY

CLALLAM RIVER

Salt Air St

Fisherman St

Frontier St

Clallam Bay Spit Acc

Pioneer St

Kalawah St

Bogachiel St

6th St

7th St

8th St

Hwy 112

Murphy Rd

Raymond St

Sol Duc St

W Kellogg St

E Kellogg St

Weel Rd

Eagle Crest Way

112

112

CLALLAM RIVER

CLALLAM RIVER

PEARSON CREEK

N

0 375 750 1,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE
- UGA BOUNDARY
- PARCEL
- WATERBODY
- WETLAND

NOTE: Wetland data was compiled by Clallam County from a variety of orginal source data including the National Wetland Inventory, Environmental Protection Agency special study, and other wetland studies.

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-8
WETLANDS (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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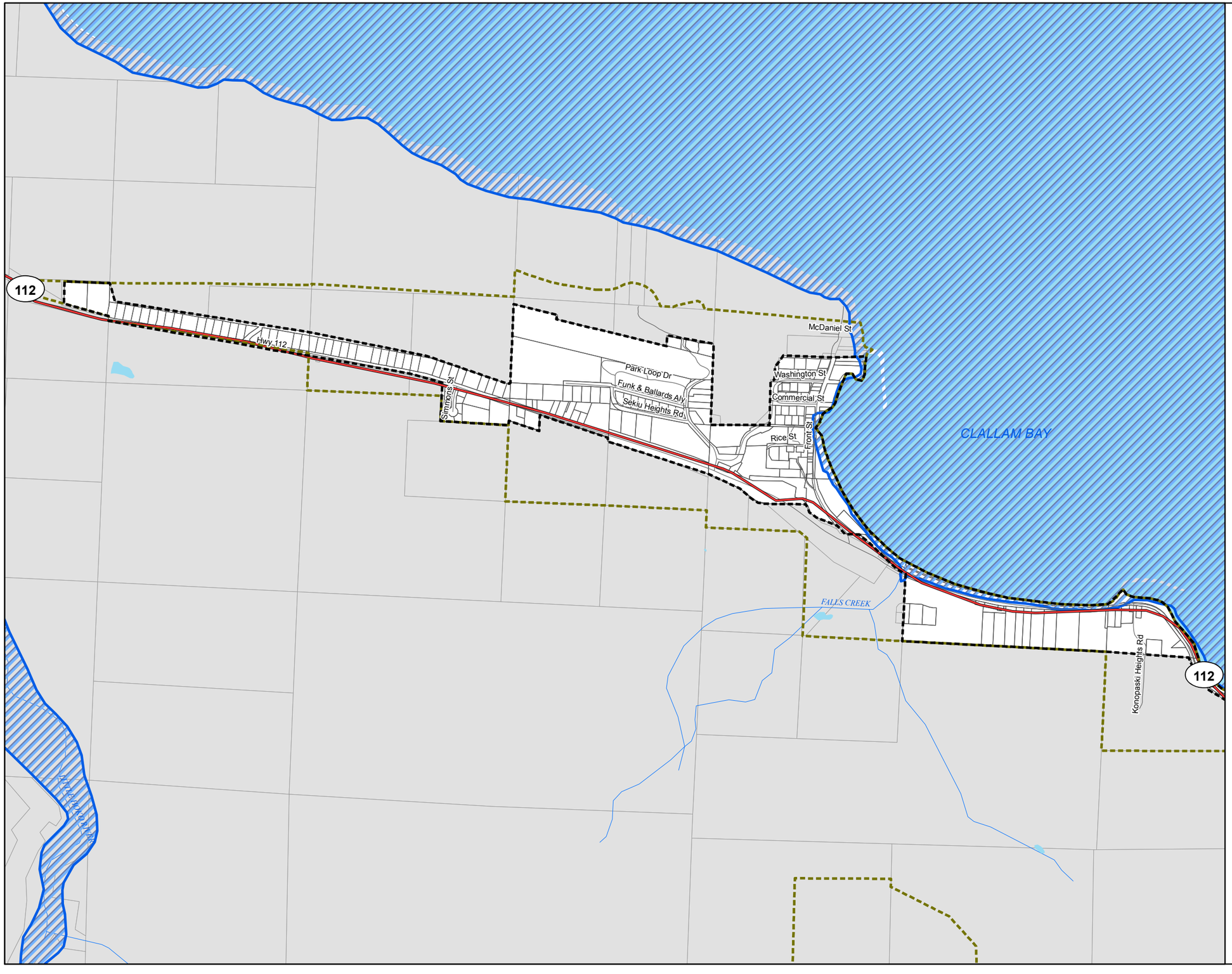

N

Feet

0 625 1,250 2,500

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY
- FEMA 100-YEAR FLOODPLAIN

NOTE: Source FEMA floodplain data, 2013.

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-9
FLOODPLAIN (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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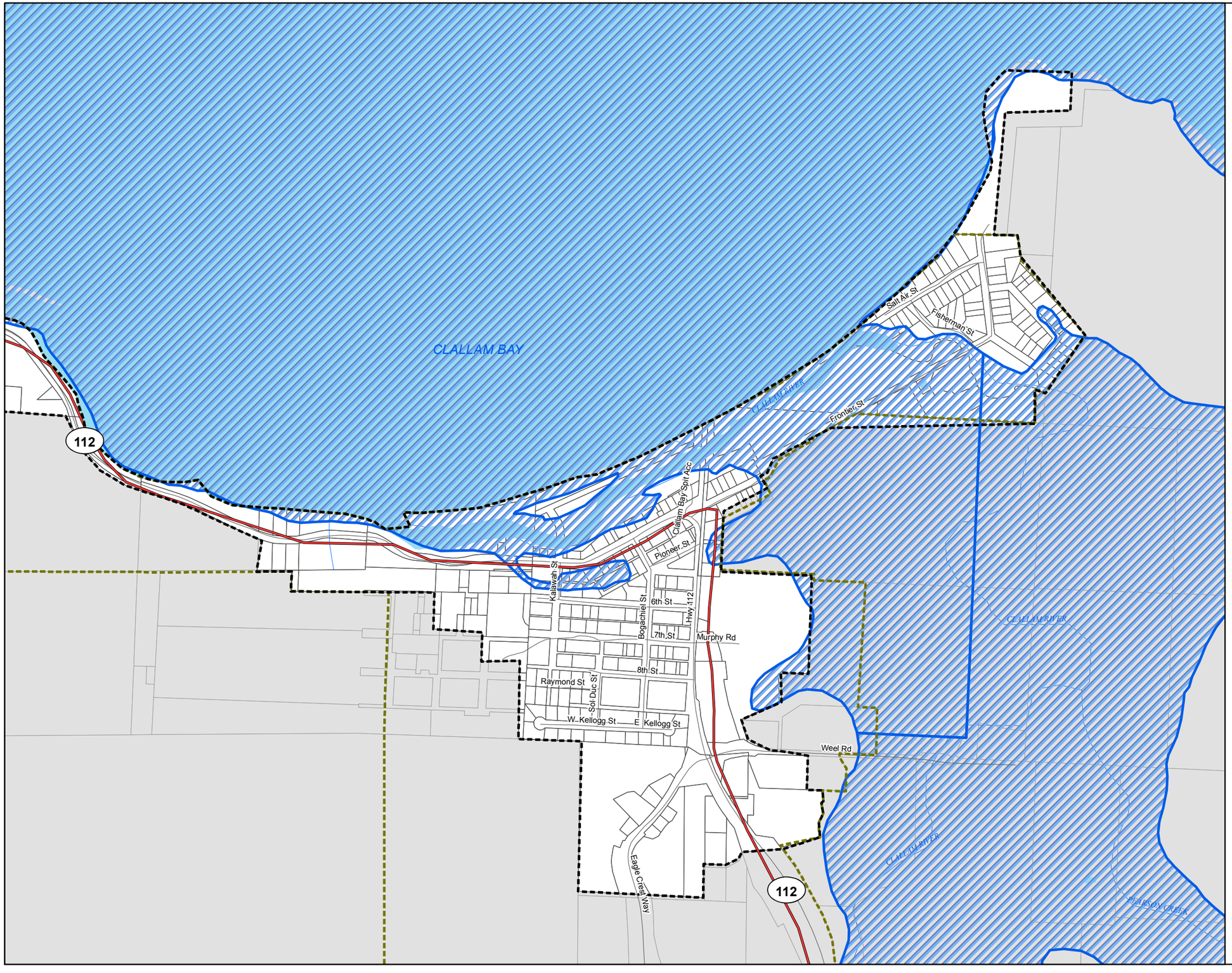

N

Feet

0 375 750 1,500

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE
- UGA BOUNDARY
- PARCEL
- WATERBODY
- FEMA 100-YEAR FLOODPLAIN

NOTE: Source FEMA floodplain data, 2013.

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-10
FLOODPLAIN (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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draw all of their water from groundwater resources; and therefore, critical aquifer recharge areas are important areas to protect. Regulated uses within a critical aquifer area are listed in Clallam County Code 27.12.605. Per County maps, there do not appear to be any critical aquifer recharge areas in the sewer service region for Sekiu and Clallam Bay.

Geologically Hazardous Areas

Seismic hazard areas are those with low-density soils that are more likely to experience greater damage due to seismic-induced subsidence, liquefaction, or landslides. Seismic hazard areas are regulated mainly with respect to public safety, and with the exception of a severe earthquake, these hazard areas do not impact wastewater facilities. The United States is divided into seismic hazard zones based upon historic documents. These zones range from Category 1 to 4, with 4 representing the highest risk. Western Washington falls into Seismic Zone 3. Erosion and landslide hazard areas are regulated under Section 27.12.415 and 27.12.420 of the Clallam County Code. The geological hazard areas for the Clallam Bay – Sekiu region are shown in Figures 2-11 and 2-12.

Fish and Wildlife Habitat Conservation Areas

Sensitive fish and wildlife habitat is defined as areas which meet the definition of a "Fish and Wildlife Habitat Critical Area" pursuant to WAC 365-190-080(5) and is essential for maintaining specifically listed species in suitable habitats. Any proposed activity within 300 feet of these areas, including construction related to wastewater collection systems, requires that a habitat assessment be prepared. The waters in the area are home to a number of species of trout and salmon, both year-round and some seasonally. The surrounding areas may contain a variety of small mammals, such as mice, squirrels, skunk, opossum, and raccoon, while the more sparsely populated areas in the hills are occupied by eagles, hawks, owls, pheasant, deer, elk or black bear. The County has mapped portions of the Sekiu area as being Priority 1 and Priority 2 Eagle Habitat areas.

Table 2-2 summarizes the priority anadromous and resident fish species in the region.

TABLE 2-2

Priority Anadromous and Resident Fish Species(1)

Species	Clallam Bay – Sekiu Region
Chinook	✓
Coho	✓
Sockeye	
Steelhead	✓
Bull Trout	✓
Fall/Winter Chum	✓
Cutthroat	✓
Coastal Cutthroat	✓

Source: WDFW Salmonscape Database and WDFW Priority Habitat Species (PHS) Database.
(1) Checkmark indicates species is present.

WATER SYSTEM

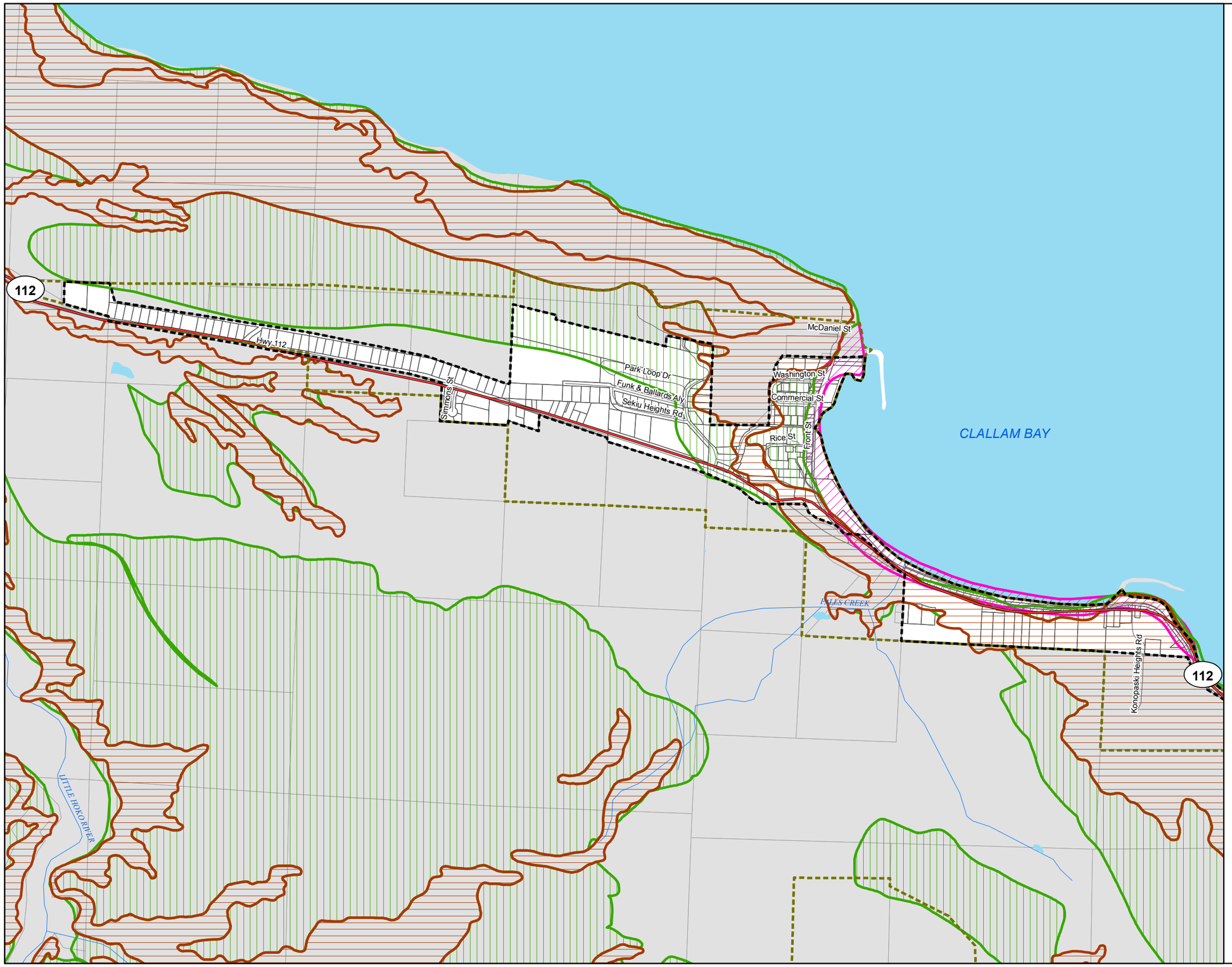
The Clallam County PUD owns and operates water systems that cover the Clallam Bay and Sekiu areas. The water system consists of one well at the Hoko well-field with a booster pump station as well as three reservoirs and a distribution system. Sekiu houses one of these reservoirs as well as two booster stations whereas Clallam Bay has no reservoirs and only one booster station. Figures 2-13 and 2-14 show the Clallam Bay and Sekiu water facilities.

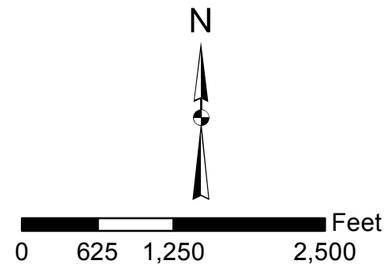
The water system serves the entire UGA. There are no public wells within the sewer service areas; however, there are two private wells in Clallam Bay and two private wells within Sekiu.

The Clallam County PUD currently has municipal water rights issued by Department of Ecology (Ecology) for a maximum instantaneous withdrawal of 563 gallons per minute (gpm) from the Hoko well-field.

PLANNING PERIOD

In order to provide wastewater services for future growth, the wastewater system is in need of continuous evaluation and improvement. A planning period for the evaluation of the wastewater utility should be long enough to be useful for an extended period of time, but not so long as to be impractical. The planning period for this Plan is from 2018 through 2038, coinciding with a 20-year planning interval.





LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE
- UGA BOUNDARY
- PARCEL
- WATERBODY

GEOLOGIC HAZARD

- EROSION
- LANDSLIDE
- SEISMIC HAZARD

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-11
GEOLOGIC HAZARDS (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\S_GEOLOGIC.mxd

CLALLAM BAY

CLALLAM RIVER

Salt Air St

Fisherman St

Frontier St

Clallam Bay Spit Acc

Pioneer St

Kalawah St

Bogachiel St

6th St

Hwy 112

7th St

Murphy Rd

8th St

Raymond St

Sol Duc St

W Kellogg St

E Kellogg St

Weel Rd

Eagle Crest Way

112

112

CLALLAM RIVER

CLALLAM RIVER

PEARSON CREEK

N

0 375 750 1,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

GEOLOGIC HAZARD

- EROSION
- LANDSLIDE
- SEISMIC HAZARD

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-12
GEOLOGIC HAZARDS (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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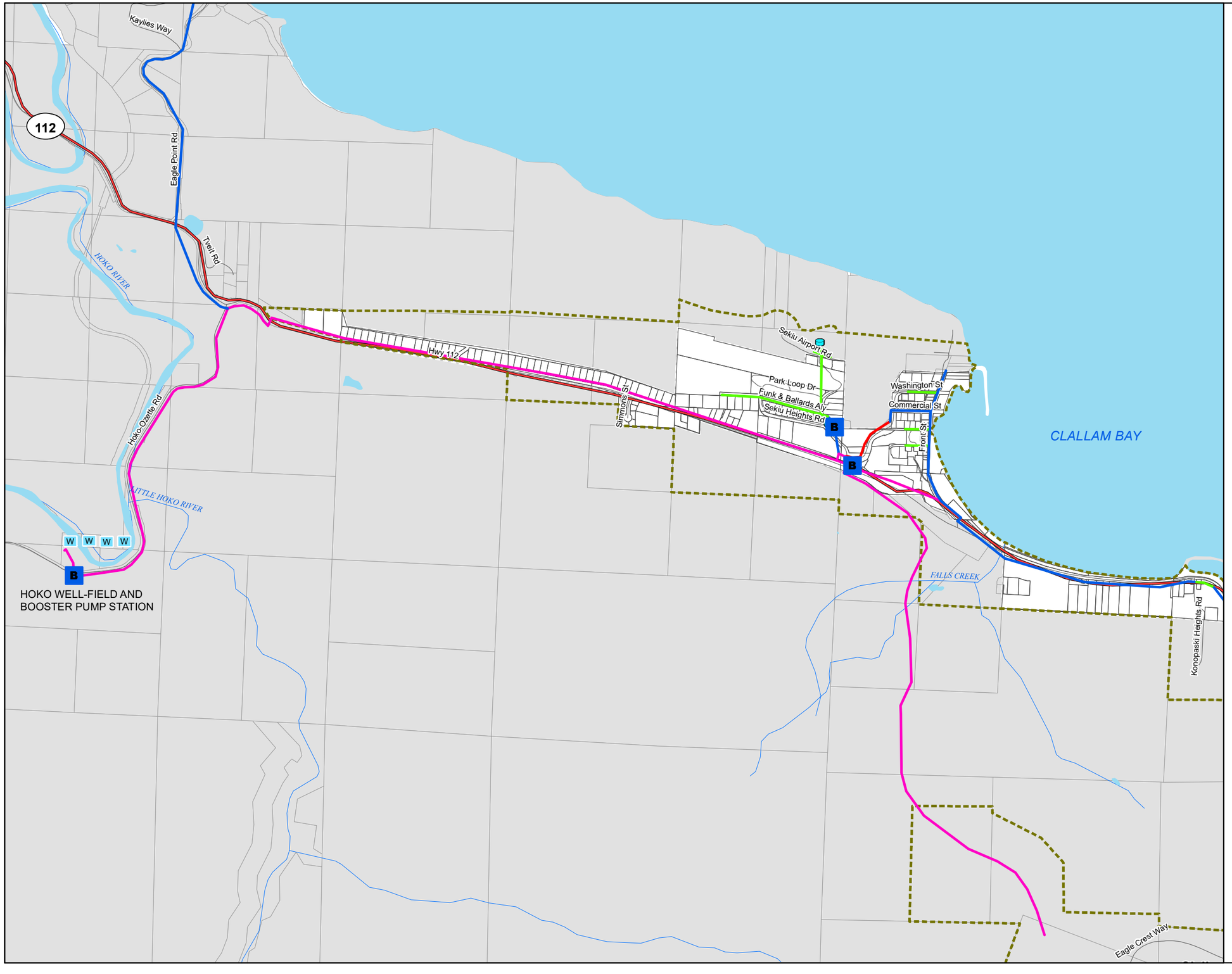

N

0 750 1,500 3,000 Feet

LEGEND

- W WELL
- RESERVOIR
- B BOOSTER STATION
- UGA BOUNDARY
- PARCEL
- WATERBODY

PIPES

- 4 inch
- 6 inch
- 8 inch
- 10 inch

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-13
WATER SYSTEM (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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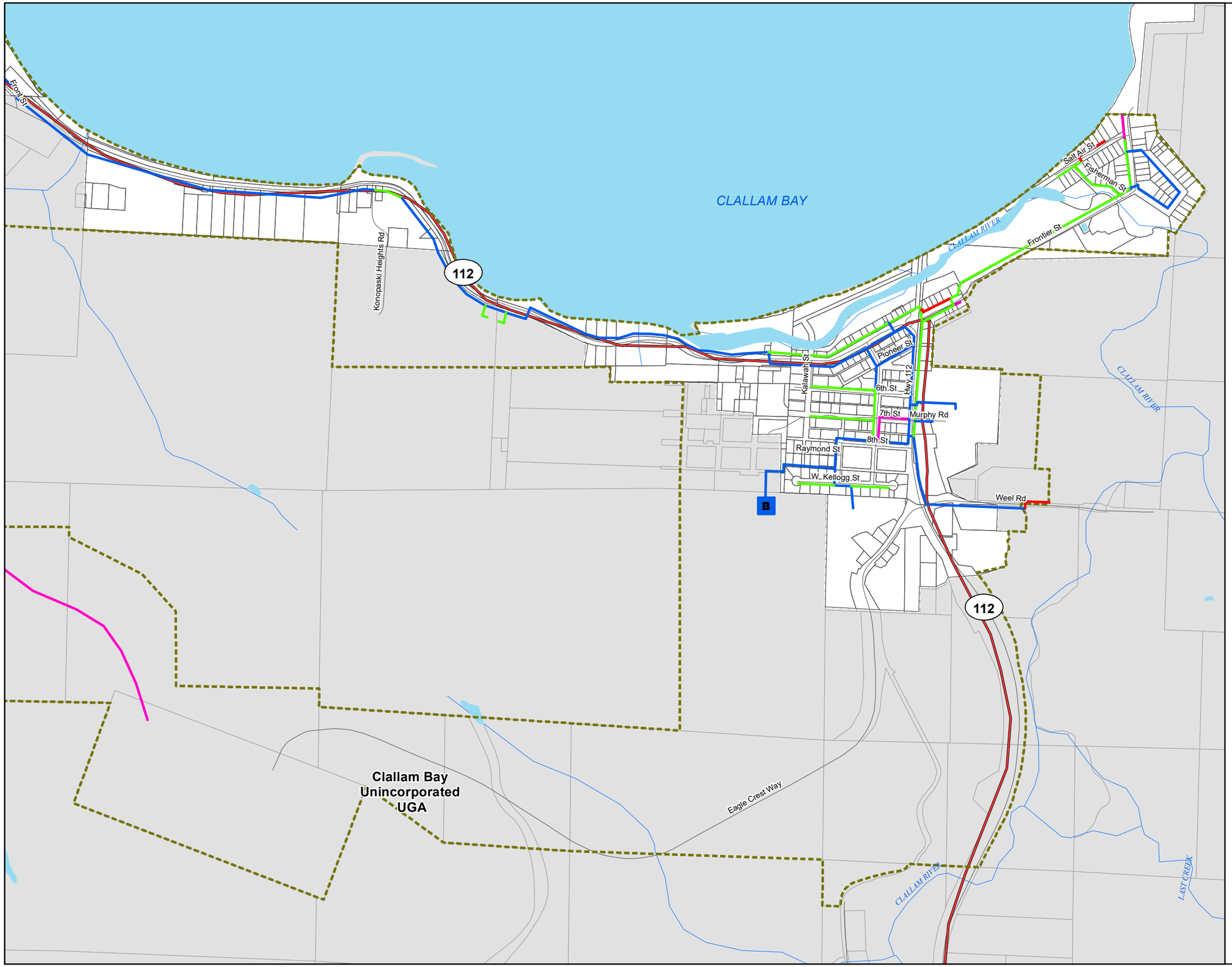

N

0 500 1,000 2,000 Feet

LEGEND

- B BOOSTER STATION
- UGA BOUNDARY
- PARCEL
- WATERBODY

PIPES

- 4 inch
- 6 inch
- 8 inch
- 10 inch

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-14
WATER SYSTEM (CLALLAM)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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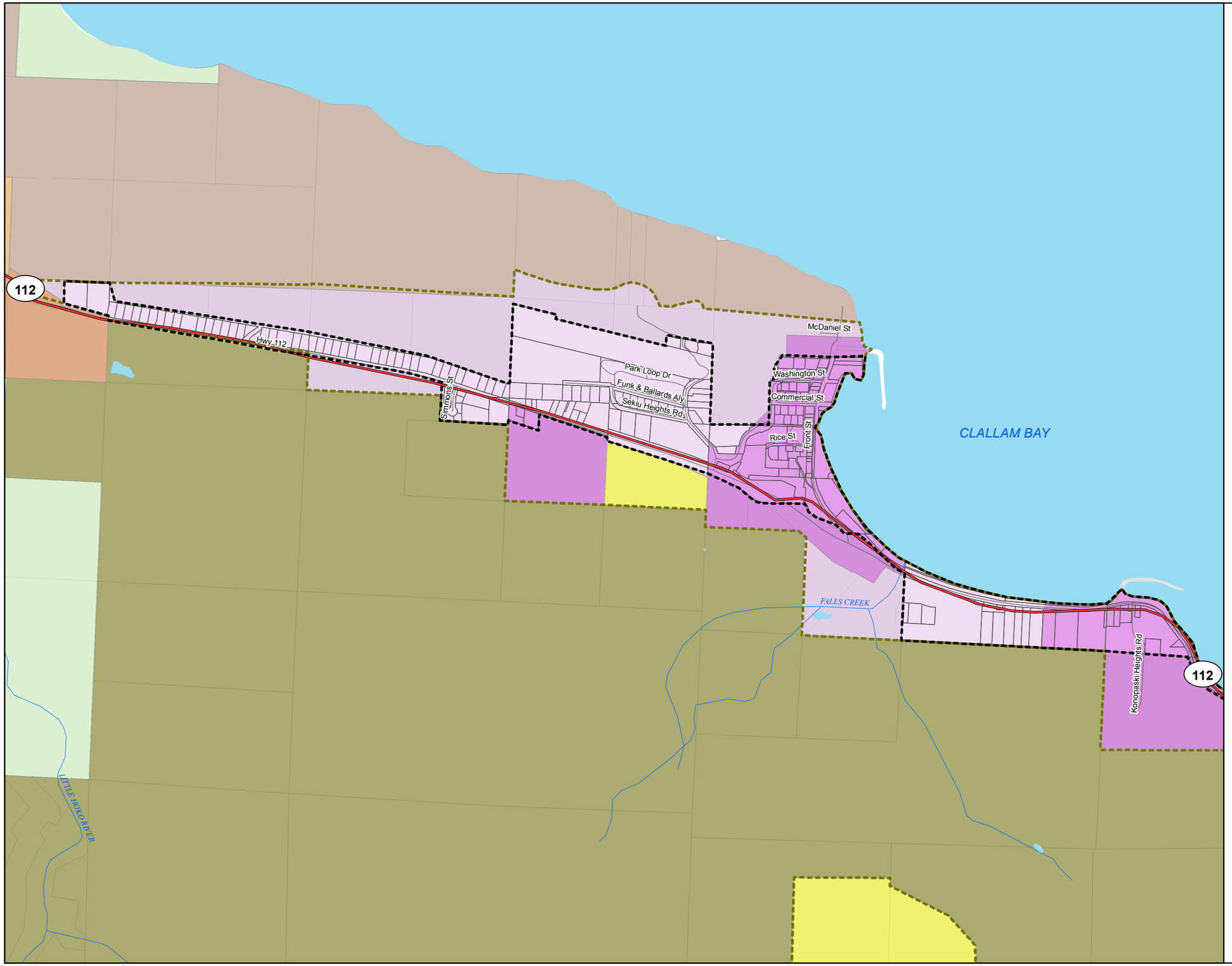

N

0 625 1,250 2,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE
- UGA BOUNDARY
- PARCEL
- WATERBODY

ZONING

- Commercial Forest
- Parks and Recreation
- Public Land
- Rural
- Rural Neighborhood Commercial
- Rural Neighborhood Conservation
- Rural Low
- Rural Very Low
- Urban Center
- Urban Residential High Density
- Industrial

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-15
ZONING/LANDUSE (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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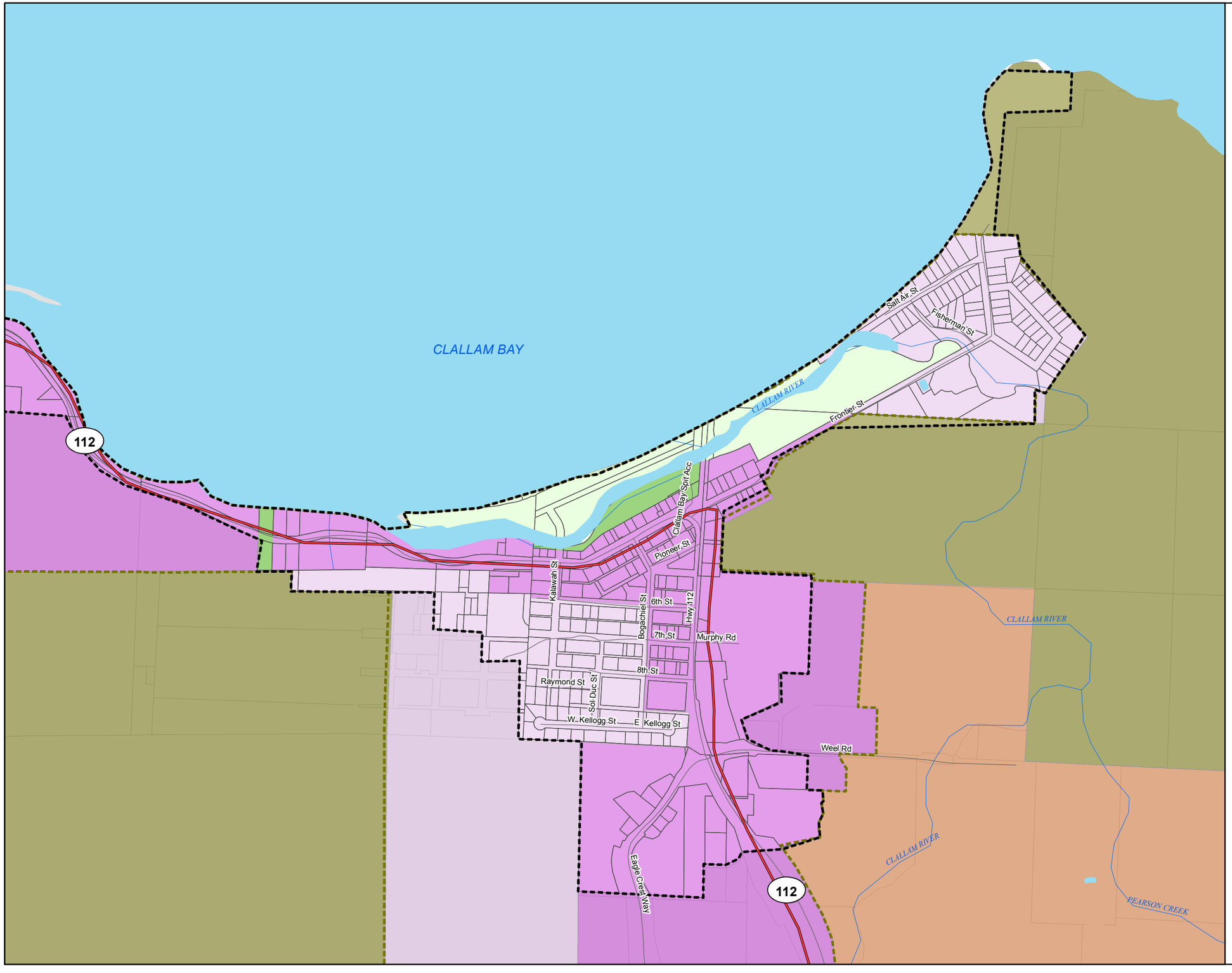

N

0 375 750 1,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

ZONING

- Commercial Forest
- Parks and Recreation
- Public Land
- Rural
- Rural Neighborhood Commercial
- Rural Neighborhood Conservation
- Rural Low
- Rural Very Low
- Urban Center
- Urban Residential High Density
- Industrial

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-16
ZONING/LANDUSE (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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LAND USE, ZONING, AND POPULATION

Table 2-3 shows a summary of land use in the Clallam Bay and Sekiu UGA. Residential land use makes up about 26 percent of Sekiu's total land area as compared to 39 percent for Clallam Bay. Urban/Industrial uses calculate to 74 percent of Sekiu's overall land use whereas Clallam Bay has 56 percent. Figures 2-15 and 2-16 show the zoning/land use within the Clallam Bay and Sekiu areas.

TABLE 2-3

Land Use

	Sekiu		Clallam Bay	
Land Use Designation	**Area[(1)] (acres)**	**Percentage**	**Area[(1)] (acres)**	**Percentage**
Urban Residential High Density	347	26%	325	39%
Urban Center	971	73%	206	25%
Industrial	20	1%	256	31%
Public Land	--	--	33	4%
Parks and Recreation	--	--	6	1%
Total	**1,337**		**826**	

(1) From 2015 GIS land use data provided by Clallam County.

CURRENT POPULATION

Table 2-4 provides a history of population for the Clallam Bay – Sekiu UGA over a 17-year period, 2000 to 2017, based on data from the Washington State Office of Financial Management (OFM). In 2017, OFM estimated the total number of occupied housing units within the UGA to be 279. The 2017 UGA population was estimated to be 562. This equates to an average population of 2.0 people per household.

TABLE 2-4

Historical Population 2000 to 2017

Year	Clallam Bay – Sekiu UGA Population[(1)]	Growth
2000	705	--
2001	673	-4.5%
2002	633	-5.9%
2003	647	2.2%
2004	623	-3.7%
2005	633	1.6%
2006	623	-1.6%
2007	592	-5.0%
2008	600	1.4%
2009	592	-1.3%
2010	547	-7.6%
2011	549	0.4%
2012	552	0.5%
2013	554	0.4%
2014	553	-0.2%
2015	551	-0.4%
2016	558	1.3%
2017	562	0.7%
Average:		1.3%

(1) Source: Washington State Office of Financial Management (OFM). Population estimated as of April 1 of each year. Populations shown above do not include the group quarter population representing prisoners at the Clallam County Correction Facility.

PROJECTED FUTURE UGA POPULATION

Per Clallam County's *Urban Growth Area Analysis and 10-Year Review* from 2007, the established population growth rate for the Clallam Bay – Sekiu UGA is estimated at 1.0 percent. Table 2-5 shows projected population totals for the next 20 years, assuming a growth of 1.0 percent per year.

TABLE 2-5

Population Projections for Clallam Bay and Sekiu UGA over the 20-Year Planning Period

Year	UGA Population[(2)]
2017	562[(1)]
2018	568
2019	573
2020	579
2021	585
2022	591
2023	597
2024	603
2025	609
2026	615
2027	621
2028	627
2029	633
2030	640
2031	646
2032	652
2033	659
2034	666
2035	672
2036	679
2037	686
2038	693

(1) Current population estimated from State OFM.
(2) Population calculated from using State OFM estimated 2017 population escalated by the 1 percent annual growth rate noted in the 2007 Clallam County *Urban Growth Area Analysis and 10-Year Review*.

SEWER CONNECTIONS

Table 2-6 provides an estimate of the average number of sewer connections to the Clallam Bay and Sekiu sewer systems in 2017, based on billing data received from the County. The County recognizes that potentially over 245 ERUs within the UGA are unbilled for. This includes 46 permanent ERUs and 199 "transient" (i.e., RV parks, motels) ERUs. This estimate has been reflected in Table 2-6.

TABLE 2-6

Average Sewer Service Connections by Customer Class for 2017

Customer Class	2017
Residential	259
Commercial	52
Public Authority	16
Total connections billed	**327**
Estimated number of unaccounted for ERUs(1)	245
Total Estimated Number of Potential Sewer Connections(1)	**572**

(1) County Staff estimate potentially 46 permanent ERUs and 199 "transient" (i.e., RV Park spaces) ERUs are currently not billed.

INDUSTRIES IN THE SEWER SERVICE AREA

Per Washington State Department of Ecology's PARIS database, there are no industries that the Clallam Bay and Sekiu areas provide sewer service to that may have an effect on the projected loadings of the sewer plants. The Clallam Bay Corrections Center holds a Municipal NPDES Permit but sewage from the Corrections Center does not flow through the Sekiu Wastewater Treatment Plant. Effluent from both the Corrections Center and Sekiu is combined into the same outfall pipe, but the County is not responsible for treating the flow from the prison. This agreement is provided in the Appendix.

CHAPTER 3

REGULATORY REQUIREMENTS

Federal and state regulatory requirements were used in developing the design criteria for improvements to the wastewater collection, treatment, and disposal facilities for Clallam Bay and Sekiu. The purpose of this chapter is to identify and summarize the regulations that affect the planning, design, and approval of improvements discussed in this plan.

This chapter does not describe each regulation in detail; rather, it addresses important facets of the regulations that affect the planning and design process. Subsequent sections of this report address technical requirements of the regulations at a level of detail appropriate for the evaluation provided by that section. For instance, Chapters 6, 7, and 8 contain more detailed information regarding wastewater collection and treatment system and biosolids management regulations.

FEDERAL AND STATE STATUTES, REGULATIONS, AND PERMITS

This section discusses some of the various federal and state laws that may affect wastewater system construction and operations, as well as other relevant permits, programs, and regulations.

FEDERAL CLEAN WATER ACT

The Federal Water Pollution Control Act is the principal law regulating the water quality of the nation's waterways. Originally enacted in 1948, it was significantly revised in 1972 and 1977, when it was given the common title of the "Clean Water Act" (CWA). The CWA has been amended several times since 1977. The 1987 amendments replaced the Construction Grants program with the Water Pollution Control State Revolving Fund (SRF) that provides low-cost financing for a range of water quality infrastructure projects.

NPDES and State Waste Discharge Permits

The National Pollutant Discharge Elimination System (NPDES) program was established by Section 402 of the CWA and its subsequent amendments. The Department of Ecology administers NPDES permits for the U.S. Environmental Protection Agency (EPA). Most NPDES permits have a 5-year term and place limits on the quantity and quality of pollutants that may be discharged to water bodies. There are four current NPDES and State Waste Discharge Permits (SWDP) issued to facilities in the Clallam Bay and Sekiu regions, as shown in Table 3-1. The NPDES program covers wastewater, industrial discharge, and stormwater permits. If considered significant, industrial discharges to municipal wastewater collection/treatment systems are typically addressed in SWDPs.

TABLE 3-1

NPDES and State Waste Discharge Permits Issued

Facility	Permit Number	Permit Type
Sekiu WWTP	WA0024449	Municipal NPDES Permit
Clallam Bay WWTP	WA0024431	Municipal NPDES Permit
Clallam County PW Umbrella Creek Pit	WAG501212	Sand and Gravel GP
WA DOC Clallam Bay Corrections Center CC	WA0039845	Municipal NPDES Permit

GP = General Permit

Sekiu WWTP NPDES Permit

The current Sekiu Wastewater Treatment Plant NPDES permit, number WA0024449 and fact sheet are attached as Appendix B. The County's current permit effluent limits are shown in Chapter 4. Condition S1 of Sekiu's permit requires the treatment plant effluent meet limits for 5-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), fecal coliform bacteria, and pH.

Condition S2 lists monitoring requirements including BOD_5 and TSS for the influent. Monitoring requirements for the effluent include flow, BOD_5, TSS, fecal coliform, pH, and temperature. Effluent characterization includes total ammonia, total phosphorous, soluble reactive phosphorus, nitrate plus nitrite nitrogen, and TKN. Permit renewal application requirements include dissolved oxygen, oil and grease, total dissolved solids, and total hardness. Condition S3 lists reporting and recording requirements.

Condition S4.A specifies the WWTP design capacity for maximum month BOD_5 loading is 135 pounds per day (lb/d) and 171 lb/d for TSS. The maximum month design flow capacity for the WWTP is 0.145 million gallons per day (mgd). Condition S4.B requires the County to prepare a plan to maintain adequate capacity when flows and loadings to the WWTP exceed 85 percent of design capacity for 3 consecutive months or the projected increase would reach design capacity within 5 years, whichever occurs first. There are other conditions of the permit that can be found in Appendix B. Chapter 7 of this plan includes an evaluation of the WWTP operating conditions and provides recommendations for improving and maintaining adequate treatment capacity to ensure long-term NPDES permit compliance.

Clallam Bay WWTP NPDES Permit

The current Clallam Bay Wastewater Treatment Plant NPDES permit, number WA0024431 and fact sheet are attached as Appendix B. The County's current permit effluent limits are shown in Chapter 4. Condition S1 of Clallam Bay's permit requires

treatment plant effluent meet limits for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), fecal coliform bacteria, and pH.

Condition S2 lists monitoring requirements including BOD_5 and TSS for the influent. Monitoring requirements for the effluent include flow, BOD_5, TSS, pH and fecal coliform. Condition S3 lists reporting and recording requirements.

Condition S4.A specifies the WWTP design capacity for maximum month BOD_5 loading is 135 pounds per day (lb/d) and 171 lb/d for TSS. The maximum month design flow capacity for the WWTP is 0.12 million gallons per day (mgd). Condition S4.B requires the County to prepare a plan to maintain adequate capacity when flows and loadings to the WWTP exceed 85 percent of design capacity for 3 consecutive months or the projected increase would reach design capacity within 5 years, whichever occurs first. There are other conditions of the permit that can be found in Appendix B. Chapter 7 of this plan includes an evaluation of the WWTP operating conditions and provides recommendations for improving and maintaining adequate treatment capacity to ensure long-term NPDES permit compliance.

Other NPDES and State Waste Discharge Permits Issued to Facilities in the Sekiu/Clallam Bay Area

There are no other permitted facilities discharging industrial wastewater to either of the treatment plants. There is a Clallam County PW Umbrella Creek Sand and Gravel General Permit which discharges to surface water.

Industrial Pretreatment/Source Control

Section 307 of the CWA established the National Pretreatment Program; 40 CFR Part 403 lists the federal pretreatment requirements. This program is designed to protect publicly owned treatment works (POTW) from pass-through of pollutants or interference with the treatment process from industrial or other non-residential discharges that is not "domestic-equivalent" (similar in quality to domestic wastewater). Neither the Sekiu or Clallam Bay wastewater treatment plants receive wastewater from industrial sources and therefore, this requirement does not apply at this time.

FEDERAL ENDANGERED SPECIES ACT

There are currently a total of seventeen salmon, steelhead, and trout Evolutionarily Significant Units (ESUs)/Distinct Population Segments (DPSs) in Washington State. Of these, four including chinook salmon, chum, steelhead, and coho salmon, are present in the Strait of Juan de Fuca near Clallam Bay.

ESA listings impact activities that affect salmon and trout habitat, such as water uses, land use, construction activities, and wastewater disposal. Impacts to the County may include longer timelines for permit applications and more stringent regulation of

construction impacts on in-water work and riparian corridors. The presence of ESA-listed species and associated critical habitat in the vicinity has the potential to impact future WWTP and outfall improvement projects.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) was established in 1969 and requires federal agencies to determine environmental impacts on all projects requiring federal permits or funding. Federally delegated activities such as NPDES permits or Section 401 certification are considered state actions and do not require NEPA compliance. If a project involves federal action (through, for example, an Army Corps of Engineers Section 404 permit), and is determined to be environmentally insignificant, a Finding of No Significant Impact (FONSI) is issued; otherwise, an Environmental Assessment (EA) or Environmental Impact Statement (EIS) would be required. NEPA is not applicable to projects that do not include a federal component or nexus. If there is a federal nexus, the County will need to follow NEPA procedures in order to obtain any permits required for upgrades to the WWTP, which are outlined in the Capital Improvement Plan of this document.

When both federal and state licenses or permits are required, then both NEPA and SEPA requirements must be met. WAC 197-11-610 allows the use of NEPA documents to meet SEPA requirements.

FEDERAL CLEAN AIR ACT

The Federal Clean Air Act requires all wastewater facilities to plan to meet the air quality limitations of the region. Sekiu and Clallam Bay fall in the jurisdiction of the Olympic Region Clean Air Agency (ORCAA).

STATE STATUTES, REGULATIONS, AND PERMITS

STATE WATER POLLUTION CONTROL ACT

The intent of the State Water Pollution Control Act is to "maintain the highest possible control standards to ensure the purity of all waters of the state consistent with public health and the enjoyment…the propagation and protection of wildlife, birds, game, fish and other aquatic life, and the industrial development of the state." Under the Revised Code of Washington (RCW) 90.48 and the Washington Administrative Code (WAC) 173-240, Ecology issues permits for wastewater treatment facilities and land application of wastewater under WAC 246-271.

Submission of Plans and Reports for Construction of Wastewater Facilities, WAC 173-240

Prior to construction or modification of domestic wastewater facilities, engineering reports, plans, and specifications must be submitted to and approved by Ecology. This regulation outlines procedures and requirements for the development of an engineering report that thoroughly examines the engineering and administrative aspects of a domestic wastewater facility project. This State regulation defines a facility plan as an engineering report under federal regulations, 40 CFR Part 35.

Key provisions of WAC 173-240 are provided below:

- An engineering report for a wastewater facility project must contain everything required for a general sewer plan unless an up-to-date general sewer plan is on file with Ecology.

- An engineering report shall be sufficiently complete so that plans and specifications can be developed from it without substantial changes.

- A wastewater facility engineering report must be prepared under the supervision of a professional engineer.

Criteria for Sewage Works Design, Washington State Department of Ecology

Ecology has published design criteria for collection systems and wastewater treatment plants. While these criteria are not legally binding, their use is strongly encouraged by Ecology since the criteria are used by the agency to review engineering reports for upgrading wastewater treatment systems. Commonly referred to as the "Orange Book," these design criteria primarily emphasize unit processes through secondary treatment, and also include criteria for planning and design of wastewater collection systems. Any expansion or modification of the County's collection system and/or WWTP will require conformance with Ecology criteria unless the County demonstrates that alternate standards provide similar reliability and efficacy.

Certification of Operators of Wastewater Treatment Plants, WAC 173-230

Wastewater treatment plant operators are certified by the State Water and Wastewater Operators Certification Board. The operator assigned overall responsibility for operation of a wastewater treatment plant is defined by WAC 173-230 as the "operator in responsible charge." This individual must have State certification at or above the classification rating of the plant.

The County's WWTP is currently assigned a Class II rating and the operating staff assigned to the plant must have the required certification. The operator in charge must have at least a Class II certification and any operators in charge of each shift must have a

Class I certification. The County currently employs two Class III operators for the WWTP.

Surface Water Quality Standards (WAC 173-201A)

WAC 173-201A establishes water quality standards within Washington State. The State adopted revised water quality standards in August 2016. The standards are based on two objectives: protection of public health and enjoyment, and protection of fish, shellfish, and wildlife. For each surface water body in the State, the standards assign specific uses, such as aquatic life, recreation, or water supply. Water quality standards have been developed for each use for parameters such as fecal coliform, dissolved oxygen, temperature, pH, turbidity, and toxic, radioactive, and deleterious substances. The surface water criteria include 29 toxic substances, including ammonia, residual chlorine, several heavy metals, polychlorinated biphenyls (PCBs), and pesticides.

Clallam Bay and Sekiu are in WRIA 19 which has no fresh water use designations. For marine waters, the designated uses in the Strait of Juan de Fuca to which the WWTPs discharge towards include:

- Excellent Aquatic Life Uses
- Shellfish Harvesting
- Primary Contact for Recreational Uses
- Wildlife Habitat
- Harvesting
- Commerce and Navigation
- Boating
- Aesthetics

It is the policy of the State of Washington to maintain existing beneficial uses of surface water by preventing degradation of existing water quality. However, certain allowances are made by Ecology for discharging treated wastewater into a surface water that enable a temporary or mitigated degradation to occur. These allowances are made by establishing mixing zones and determining the assimilative capacity of the receiving water.

The anti-degradation policy aims to maintain the highest possible quality of water in the State by preventing the deterioration of water bodies that currently have higher quality than the water quality standards require. The revised water quality standards define three tiers of waters in the anti-degradation policy:

- Tier I water bodies are those with violations of water quality standards from natural or human-caused conditions. The focus of water quality management is on maintaining or improving current uses and preventing any further human-caused degradation.

- Tier II water bodies are those of higher quality than required by the water quality standards. The focus of the policy is on preventing degradation of the water quality and to preserve the excellent natural qualities of the water body. New or expanded actions are not allowed to cause a "measurable change" in the water quality unless they are demonstrated to be "necessary and in the overriding public interest."

- Tier III are the highest quality "outstanding resource waters." Tier III(A) prohibits any and all future degradation, or Tier III(B) which allows for de minimis (below measurable amounts) degradation from well-controlled activities.

Discharging to surface water requires an NPDES permit issued by Ecology under WAC 173-220. Wastewater treatment plants must generally, at a minimum, meet technology-based limits that include 30 mg/L total suspended solids (TSS) and 30 mg/L 5-day biochemical oxygen demand (BOD_5) (typically termed "30-30 limits"). Additionally, under WAC 173-201A-060, State Water Quality Standards, Ecology is authorized to condition NPDES permits so that the discharge meets water quality standards. Therefore, other permit conditions in addition to or more stringent than the 30-30 limits could be added to ensure that the water quality of the receiving water is not degraded.

The State updated its water quality standards in 2016. The biggest changes were due to a reassessment of human health protection based on increased assumptions of fish consumption rates.

RECLAIMED WATER STANDARDS

The State *Water Reclamation and Reuse Standards* define the water quality standards for reclaimed water. The Clallam Bay and Sekiu WWTPs do not generate reclaimed water; however, an evaluation of the feasibility of generating reuse water generated at the existing WWTPs (after appropriate modifications) is provided in Chapter 7, as required by State regulations.

The standards for the use of reclaimed water are outlined in RCW 90.46 and in WAC 173-219, adopted in January 2018. Reclaimed water is the effluent derived from a wastewater treatment system that has been adequately and reliably treated, such that it is no longer considered wastewater and is suitable for a beneficial use or a controlled use that would not otherwise occur. The legislature has declared that "the utilization of reclaimed water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife habitat creation and enhancement purposes (including wetland enhancement) will contribute to the peace, health, safety, and welfare of the people of the State of Washington."

The generation of Class A reclaimed water (the highest quality) has four minimum requirements that are described below:

1. **Continuously Oxidized** – Wastewater that at all times has been stabilized such that the monthly average BOD_5 and TSS are less than 30 mg/L, is non-putrescible, and contains dissolved oxygen.

2. **Continuously Coagulated** – Oxidized wastewater that at all times has been treated by a chemical or equally effective method to destabilize and agglomerate colloidal and finely suspended matter prior to filtration.

3. **Continuously Filtered** – Oxidized and coagulated wastewater that at all times has been passed through a filtering media so that the turbidity of the filtered effluent does not exceed an average of 2 nephelometric turbidity units (NTU), determined monthly, and does not exceed 5 NTU at any time.

4. **Continuously Disinfected** – Oxidized, coagulated, and filtered wastewater that at all times has been disinfected to kill or inactivate pathogenic organisms. A group of indicator microorganisms, coliform bacteria, are used to measure the effectiveness of the disinfection process. The Class A reclaimed water standard is a total coliform density of 2.2 per 100 milliliters (ml) for the median of the last 7 days of samples, with no sample having a density greater than 23 per 100 ml.

Reclaimed water may be used to recharge groundwater by surface percolation or through direct injection, as long as the quality of the reclaimed water meets groundwater recharge criteria which are defined in the Reuse Standards. Groundwater recharge projects must also be in compliance with the State's groundwater regulations listed in WAC 173-200. This regulation contains groundwater quality criteria that are to be met in the saturated zone. Recharge of groundwater with reclaimed water would require a state waste discharge permit issued by Ecology. Ecology may also require the development of a groundwater monitoring program to ensure degradation does not occur.

Discharge of reclaimed water for the purpose of stream flow augmentation, fish and wildlife habitat, irrigation supply, or water right replenishment or transfer must comply with WAC Chapter 173-201A. A beneficial use of the reclaimed water must be established for the project to be accepted as a stream flow augmentation project.

Short-term storage or an alternative disposal system (e.g., an outfall) must be provided for situations where the reclaimed water cannot be used due to bad weather, reduced demand, etc. Provisions must also be made for storage or disposal of water that does not meet the treatment and water quality criteria, perhaps due to a treatment upset or equipment failure.

The Reuse Standards require reliability for individual treatment units such as biological treatment, secondary clarification, coagulation, filtration, and disinfection. Generally, if long-term storage or an alternative disposal method is not available, the facility must have redundant units each capable of treating the entire flow, or short-term storage with standby replacement equipment provided. Furthermore, coagulation and chlorination unit processes must have standby chemical feed equipment provided, regardless of storage and disposal options, to ensure uninterrupted chemical feed.

The rule refers to a Reclaimed Water Facilities Manual, a.k.a., the "Purple Book," for supplemental guidance on implementing the rule. Gray & Osborne, Inc. was retained by the Washington Coalition for Clean Water and the Washington State Department of Ecology (Ecology) to assist in development of the manual, which was released in draft form for review by stakeholders. The Purple Book is currently being revised to ensure consistency with WAC 173-219, adopted this year.

STATE ENVIRONMENTAL POLICY ACT

WAC 173-240-050 requires a statement in all wastewater comprehensive plans regarding proposed projects in compliance with the State Environmental Policy Act (SEPA), if applicable. The capital improvements proposed in this plan will fall under SEPA regulations. A SEPA checklist is included in Appendix A of this plan for use in the environmental review for the project. In most cases, a Determination of Non-Significance (DNS) is issued; however, if a project will have a probable significant adverse environmental impact, an Environmental Impact Statement (EIS) will be required.

ACCREDITATION OF ENVIRONMENTAL LABORATORIES (WAC 173-050)

The State of Washington established a requirement that all laboratories reporting data to comply with NPDES permits must be generated by an accredited laboratory. This accreditation program establishes specific tasks for quality control and quality assurance (QA/QC) that are intended to ensure the integrity of laboratory procedures. Accreditation requirements must be met for any on-site laboratory or outside laboratory used to analyze samples. Only accredited laboratories may be used for analyses reported for compliance with NPDES permits. In planning for an on-site laboratory, staffing must be sufficient to allow for QA/QC procedures to be performed. The Clallam Bay WWTP laboratory is currently accredited for testing the following parameters for both the Sekiu and Clallam Bay WWTPs: TSS, BOD_5, temperature, dissolved oxygen, pH, and fecal coliform.

MINIMAL STANDARDS FOR SOLID WASTE HANDLING (WAC 173-304)

Grit and screenings are not subject to the sludge regulations in WAC 173-308, but their disposal is regulated under the State solid waste regulations, WAC 173-304. Waste placed in a municipal solid waste landfill must not contain free liquids, nor exhibit any of the criteria of a hazardous waste as defined by WAC 173-303. To be placed in a

municipal solid waste landfill, grit, screenings, and incinerator ash must pass the paint filter test. This test determines the amount of free liquids associated within the solids and includes the toxic characteristic leachate procedure (TCLP) test, which determines if the waste has hazardous characteristics.

WETLANDS

Dredging and Filling Activities in Natural Wetlands (Section 404 of the Federal Water Pollution Control Act)

A U.S. Army Corps of Engineers permit is required when locating a structure, excavating, or discharging dredged or fill material in waters of the United States or transporting dredged material for the purpose of dumping it into ocean waters. Typical projects requiring these permits include the construction and maintenance of piers, wharves, dolphins, breakwaters, bulkheads, jetties, mooring buoys, and boat ramps.

If wetland fill activities cannot be avoided, the negative impacts can be mitigated by creating new wetland habitat in upland areas. If other federal agencies agree, the Corps would generally issue a permit.

Wetlands Executive Order 11990

This order directs federal agencies to minimize degradation of wetlands and enhance and protect the natural and beneficial values of wetlands. This order could affect the siting of lift stations and sewer lines.

SHORELINE MANAGEMENT ACT

The Shoreline Management Act of 1971 (RCW 90.58) establishes a broad policy giving preference to shoreline uses that protect water quality and the natural environment, depend on proximity to the water, and preserve or enhance public access to the water. The Shoreline Management Act jurisdiction extends to lakes or reservoirs of 20 acres or greater, streams with a mean annual flow of 20 cubic feet per second (cfs) or greater, marine waters, and any area inland 200 feet from the ordinary high-water mark. Projects are reviewed by local governments according to State guidelines.

The Sekiu WWTP and portions of both the Clallam Bay and Sekiu collection systems are located within shoreline areas.

FLOODPLAIN DEVELOPMENT PERMIT

Local governments that participate in the National Flood Insurance Program are required to review projects in a mapped floodplain and impose conditions to reduce potential flood damage from floodwater. A Floodplain Development Permit is required prior to construction, including projects involving wastewater collection facilities.

HYDRAULIC PROJECT APPROVAL

Under the Washington State Hydraulic Code (WAC 220-110), the WDFW requires a hydraulic project approval (HPA) for activities that will "use, divert, obstruct, or change the natural flow or bed" of any waters of the State. For County activities, such as pipeline crossings of streams or WWTP outfall modifications, an HPA will be required. The HPA will include provisions necessary to minimize project-specific and cumulative impacts to fish.

COUNTY SEWER ORDINANCES AND PLANNING POLICIES

The County has a Municipal Code that regulates sewer services. This chapter of the municipal code has been included in Appendix C. The sewer ordinances address such issues as requirements for connections to sewer system, on-site system requirements, and rates for sewer service.

The County is currently drafting administrative policy for sewer systems which will address leak adjustments and a utility lien process.

Per Section 41.20.060 of the current code, all properties within the County's sewer service area that are within 200 feet of an existing sanitary sewer service are required to connect to the County's sewer system. As the code is currently written, any parcel connecting to the sewer system that is not within the original ULID delineation, must pay twice the connection fee as a parcel within the ULID area. The County intends to update this code in the near future to reference sanitary service within the UGA areas.

Additionally, any utility work within shoreline areas would be entitled to the provisions of CCC 27.12.030 which requires a Shorelines Permit for development activity.

CHAPTER 4

EXISTING FACILITIES

This chapter describes existing facilities within the Clallam Bay - Sekiu wastewater collection and treatment systems. These facilities include pressure and gravity sewers, pump stations, wastewater treatment plants, and outfalls.

WASTEWATER COLLECTION SYSTEM

COLLECTION SYSTEM

Gravity sewer lines in the Sekiu and Clallam Bay areas were first constructed in the mid-1970s and are mainly constructed of 8-inch concrete pipe. Much of this original sewer pipe is still in place today. As the County completes construction projects within the sewer service area, PVC pipe is being installed to reduce infiltration and improve the condition of the sanitary sewer system. Currently, there are 36,110 feet of concrete mains and 1,635 feet of PVC mains in the combined Sekiu and Clallam Bay gravity main system.

Figures 4-1 and 4-2 show the existing sewer system. Wastewater is discharged to the County's two wastewater treatment facilities, which have outfalls to the bay. The sewer system service area generally slopes down from the south to the north toward the bay, where the treatment facilities are located. Most of the collection system consists of gravity sewers, which drain to pump stations and force mains. The current system consists of 8-inch to 14-inch diameter pipe, constructed mostly of concrete.

A summary of the various pipe diameters within the Sekiu and Clallam Bay's gravity sewer system are provided in Table 4-1. This summary is an estimate based on review of as-built drawings and information provided by the County.

TABLE 4-1

Sanitary Sewer Pipe Summary

Pipe Diameter and Type	Sekiu Length (feet)	Clallam Bay Length (feet)
4-Inch Force Main	1,895	390
6-Inch Force Main	2,130	0
8-Inch Force Main	5,010	2,770
8-Inch Gravity	17,926	16,376
10-Inch Gravity	0	1,652
12-Inch Gravity	720	0
14-Inch Gravity	1,358	0
Total	**29,039**	**21,188**

The Sekiu sanitary sewer system contains a total of approximately 64 manholes while the Clallam Bay sewer system contains approximately 83 manholes. All of the manholes are precast concrete manholes. Older concrete manholes may present a greater potential for infiltration to occur due to the joints between the manhole sections.

COLLECTION AREAS

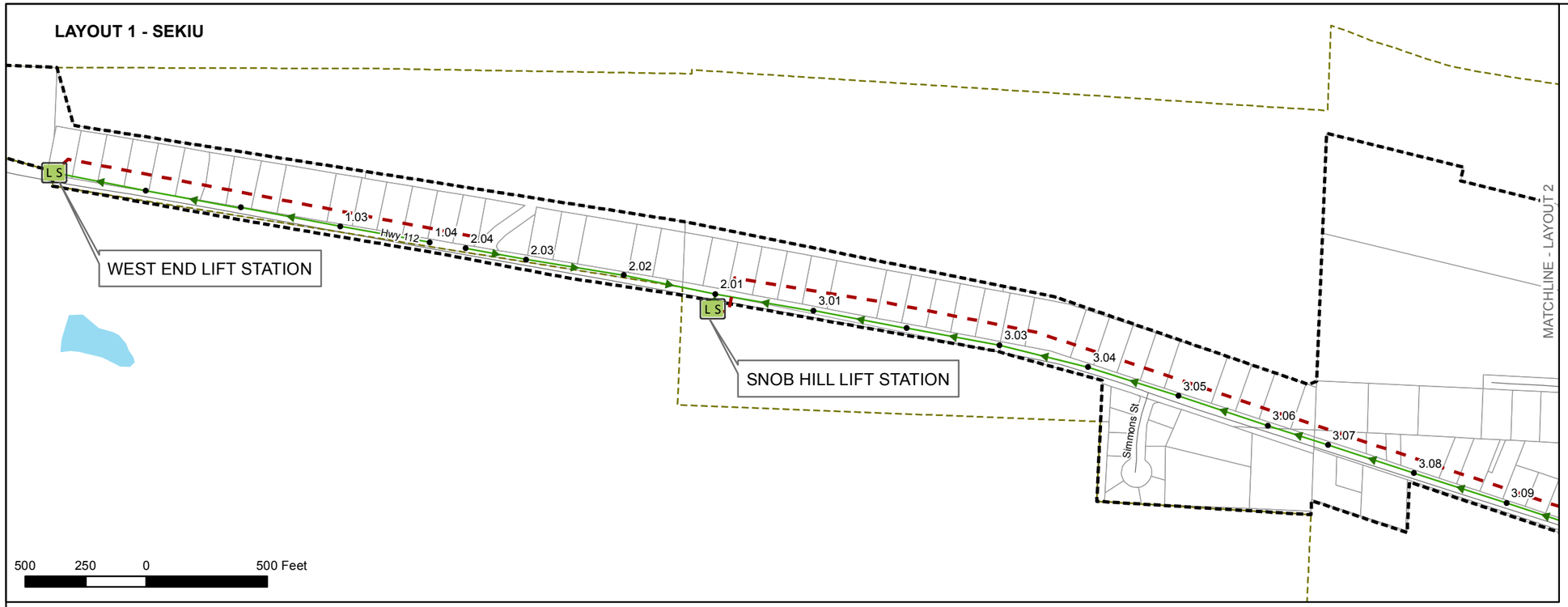
For the purposes of this plan, the Sekiu collection system is divided into a total of six collection areas, or drainage basins, while Clallam Bay is divided into four drainage basins. These collection areas predominantly follow the natural drainage patterns of the service area where most drain to a pump station and some flow directly to the wastewater treatment plant. The ten major basins are shown in Figure 4-3.

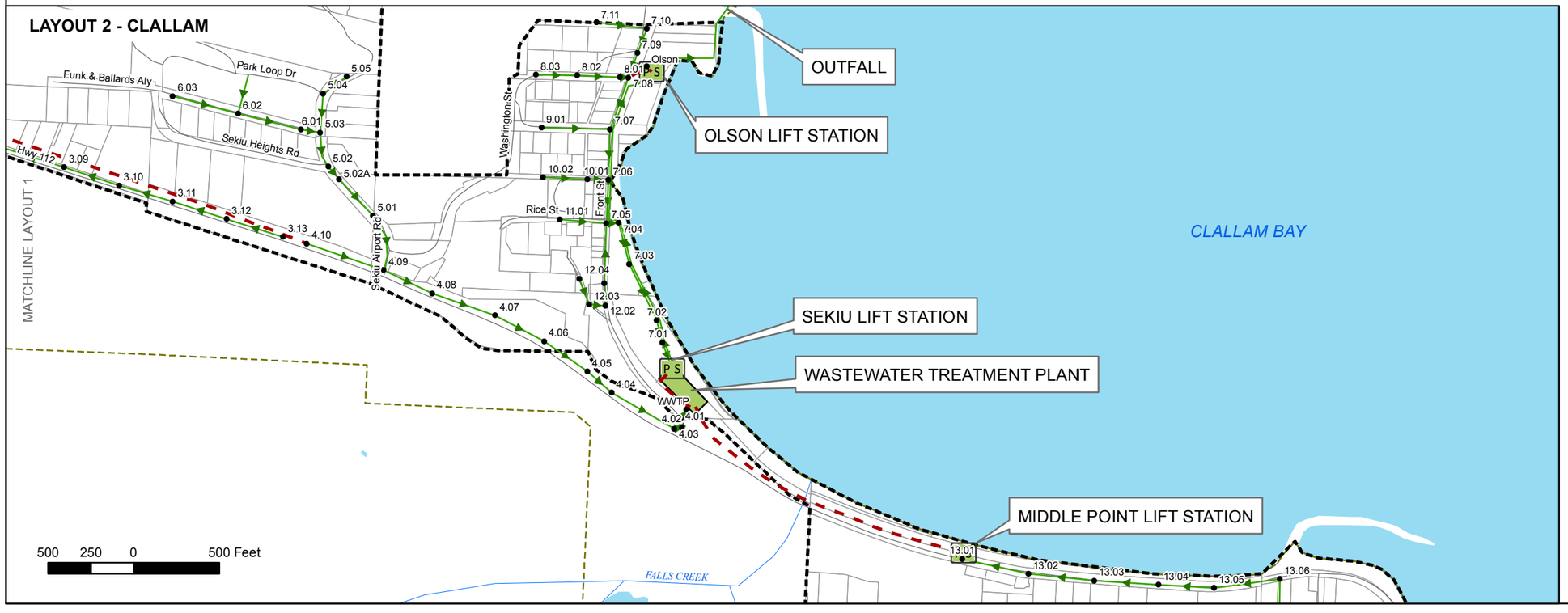
The following section describes the boundaries and land use designations of each basin as well as information about the sewer lines within each basin.

Sekiu Basins

West End LS Basin

The West End LS Basin consists of an area of approximately 32 acres on the west side of Sekiu along Highway 112. This basin includes areas primarily designated for urban residential high density use which allows up to 3.5 dwelling units per acre. Currently, there are an estimated 12 ERUs within this basin. Wastewater from this area flows west by gravity to the West End LS, which conveys the wastewater into the Snob Hill LS Basin via 1,730 feet of 4-inch diameter force main.





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LEGEND

- SEWER MANHOLE
- FORCE MAIN
- SANITARY SEWER PIPE
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 4-1
SEWER SYSTEM (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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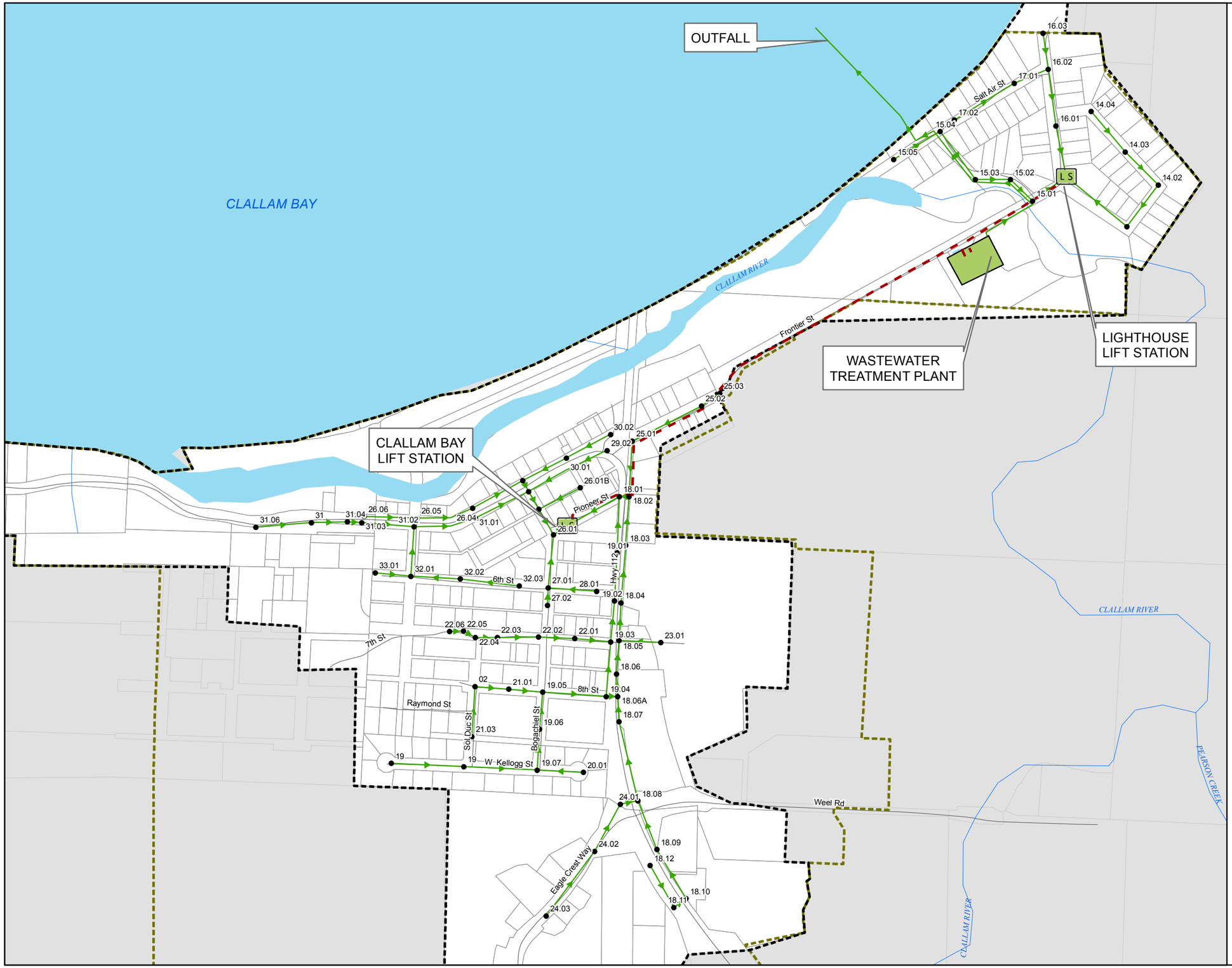

N

0 250 500 1,000 Feet

LEGEND

- SEWER MANHOLE
- SANITARY SEWER PIPE
- FORCE MAIN
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 4-2
SEWER SYSTEM (CLALLAM BAY)

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CONSULTING ENGINEERS

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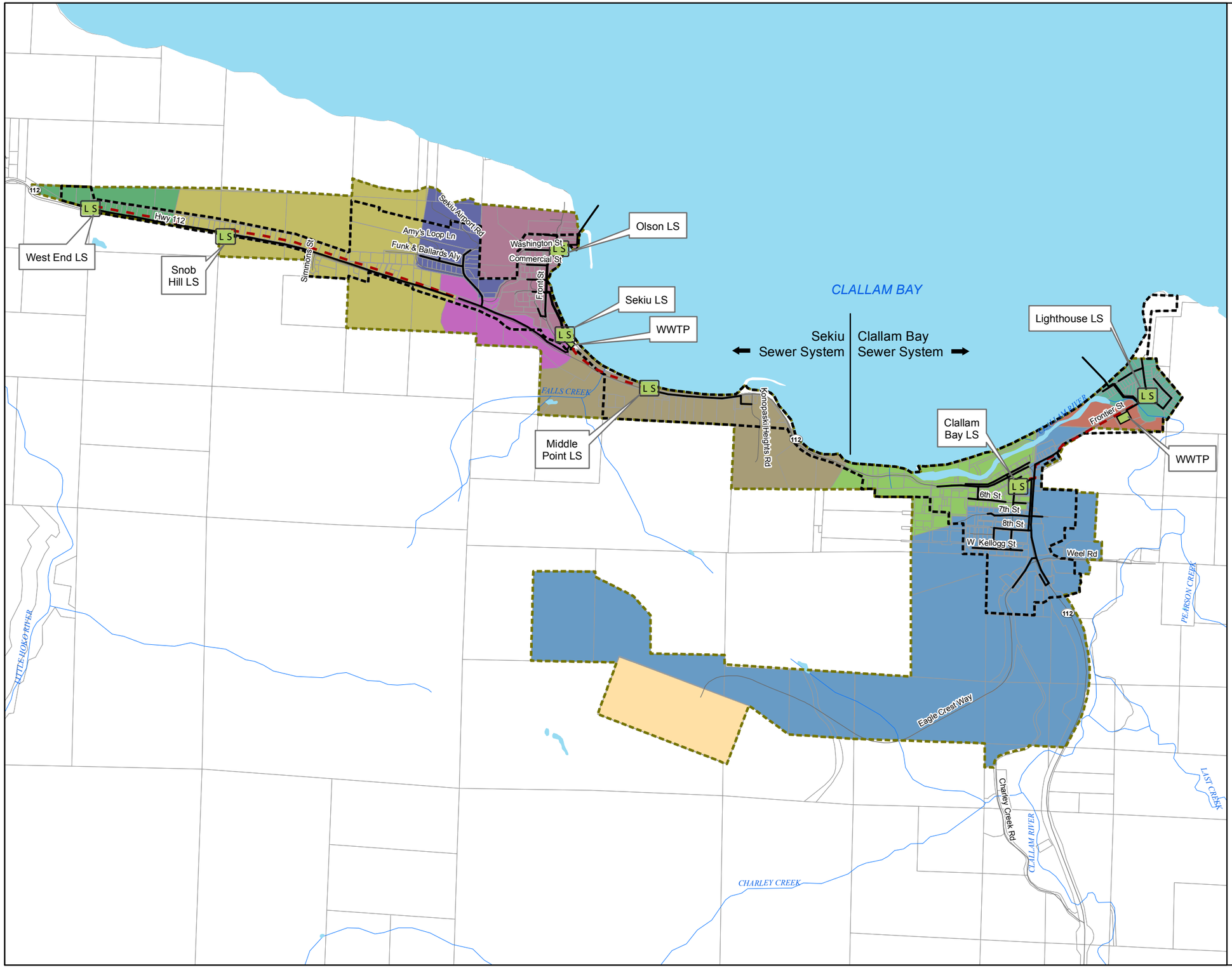

N

0 1,000 2,000 4,000 Feet

LEGEND

SEWER BASIN

- CLALLAM BAY LS (EAST)
- CLALLAM BAY LS (WEST)
- CLALLAM BAY WWTP
- CLALLAM COUNTY CORRECTIONS FACILITY
- HIGHWAY 112
- LIGHTHOUSE LS
- MIDDLE POINT LS
- SEKIU AIRPORT Rd
- SEKIU LS
- SNOB HILL LS
- WEST END LS
- EXISTING SANITARY SEWER PIPE
- FORCE MAIN
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 4-3
SANITARY SEWER BASINS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Snob Hill LS Basin

The Snob Hill LS Basin is located directly east of the West End LS Basin and consists of approximately 214 acres. Similar to the West End LS Basin, the Snob Hill LS Basin includes urban residential high-density land use. Currently, there are an estimated 46 ERUs within this basin. Wastewater from this basin flows into the Highway 112 Basin at Manhole 4-10, via 5,010 feet of 8-inch force main.

Sekiu Airport Road Basin

The Sekiu Airport Road Basin consists of an area of approximately 47 acres in the northern portion of the Sekiu UGA, near the Sekiu Airport. The Sekiu Airport Road Basin includes areas designated as urban residential high-density land use. Currently, there are an estimated 47 ERUs within this basin. Wastewater from this basin flows south by gravity into the Highway 112 Basin and then discharges into the Sekiu WWTP.

Highway 112 Basin

The Highway 112 Basin is located along Highway 112 just southwest of the downtown core of Sekiu. It consists of approximately 47 acres. This basin includes areas primarily designated as the urban center or urban residential high-density land use. Currently, there are an estimated 4 ERUs within this basin. Wastewater from this area flows by gravity to the east into the Sekiu WWTP. Flows from the West End LS, Snob Hill LS, and Sekiu Airport Road Basins flow into the Highway 112 Basin.

Sekiu LS Basin

The Sekiu LS Basin consists of an area of approximately 80 acres located in downtown Sekiu. This area is designated as an urban center, allowing up to 3.5 homes per acre however, as shown in Figure 2-11, a portion of this basin exists within a landslide area and may not be fully developed in the future. The Sekiu LS Basin consists of predominantly residential, motels and RV resorts. Olson's Resort resides in the north portion of the basin where 70 RV sites provide sanitary sewer service connected to the Olson LS. The County has assumed ownership of this lift station which conveys wastewater southwest into the gravity main along Front Street. Sanitary flows from the Olson LS are conveyed to Manhole No. 7.08 at the intersection of Washington Street and Front Street via 180 feet of 4-inch force main. From there, wastewater from the Sekiu LS Basin flows south by gravity to the Sekiu LS located adjacent to the Sekiu WWTP. Flows from the Sekiu LS are pumped directly into the WWTP via 360 feet of 6-inch force main. Currently, there are an estimated 102 ERUs within this basin.

Middle Point LS Basin

The Middle Point LS Basin consists of an area of approximately 141 acres and is located on the east side of Sekiu, adjacent to Clallam Bay. This basin currently includes

single-family residential houses, commercial areas and Coho Estates which is an RV park containing 60 sites. It also lies within a landslide area. Currently, there are an estimated 46 ERUs within this basin. Future land use includes areas primarily designated as the urban center or urban residential high-density land use. Wastewater from this area flows by gravity in a westerly direction toward the Middle Point LS and is then pumped directly into the Sekiu WWTP via 1,770 feet of 6-inch force main.

Clallam Bay Basins

Clallam Bay LS (West) Basin

The Clallam Bay LS (West) Basin consists of an area of approximately 87 acres on the northwest side of the Town of Clallam Bay, adjacent to the Clallam River and Clallam Bay. The current land use consists of mostly residential and commercial properties with a future land use designation listed as the urban center or urban residential high-density land use. The west portion of this basin lies within a landslide area. Currently, there are an estimated 41 ERUs within this basin. Wastewater from this area flows generally to the east by gravity toward the Clallam Bay Lift Station which conveys the wastewater directly to the Clallam Bay WWTP via 2,770 feet of 8-inch force main.

Clallam Bay LS (East) Basin

The Clallam Bay LS (East) Basin consists of an area of approximately 390 acres in west Sekiu. The Clallam Bay LS (East) Basin currently consists of residential and commercial uses as well as the Clallam Bay School which offers education from kindergarten through 12th grade. A southern portion of this basin contains steep slopes that may not be developable. Currently, there are an estimated 89 ERUs within this basin that flow to the Clallam Bay WWTP. Wastewater from the Clallam Bay (East) LS Basin generally flows north by gravity and then west to the Clallam Bay LS which conveys flows directly to the Clallam Bay WWTP.

Lighthouse LS Basin

The Lighthouse LS Basin is a small basin consisting of 30 acres in the northeast portion of Clallam Bay. This basin includes primarily residential areas and is designated as an urban residential high density land use. Currently, there are an estimated 70 ERUs within this basin. Wastewater from this area flows by gravity to the Lighthouse LS, which conveys wastewater to the Clallam Bay WWTP via 690 feet of 4-inch diameter force main.

Clallam Bay WWTP

The Clallam Bay WWTP Basin consists of a 20-acre area in the northeast portion of Clallam Bay. This basin is partially public land and partially urban residential

high-density land use. Currently, it just houses the Clallam Bay WWTP. No gravity services outside of the WWTP exist within this basin.

Clallam Bay Corrections Facility

The Clallam Bay Corrections Facility Basin is within the Sekiu – Clallam Bay UGA, however, this facility has a separate wastewater treatment system whose flows are entirely isolated from the Clallam Bay system with the exception of the outfall pipe which is shared between the Sekiu WWTP and the Corrections Facility.

LIFT STATIONS

The Clallam Bay sewer system includes two lift stations whereas the Sekiu sewer system includes five lift stations. Lift station locations and force main routes for Sekiu and Clallam Bay are shown in Figures 4-1 and 4-2, respectively. For Clallam Bay, the Clallam Bay Lift Station collects flow from the central portion of Clallam Bay while the Lighthouse Lift Station collects flow from the northeast portion of the UGA towards the east end of Frontier Street. In Sekiu, the West End and Snob Hill Lift Stations collect flow from the west portion of the UGA and direct it toward the treatment plant located on the bay. The Middle Point Lift Station collects flow from an area along State Route 112, adjacent to the bay and the Olson and Sekiu Lift Stations take flow from the northwest portion of the UGA directly into the Sekiu treatment plant. A schematic showing how the pump stations are linked is shown in Figure 4-4.

Basic information about the pumps and force mains is shown in Table 4-2. Five of the seven lift stations are equipped with submersible pumps whereas the other two are wet pit/dry pit stations. Almost all of the lift stations have two pumps that alternate between being the primary pump and backup pump. The one exception to this is Pump 1 at the Snob Hill LS which has had mechanical issues and, therefore, Pump 2 has served as the primary pump. It should be noted that County staff feel the pumps do not pump to the nominal capacity stated in Table 4-2; however, drawdown tests were not performed to confirm this. The County standardized on Wemco pumps with the exception of the Snob Hill Lift Station which has Smith & Loveless pumps and the Olson Lift Station which has Essco pumps.

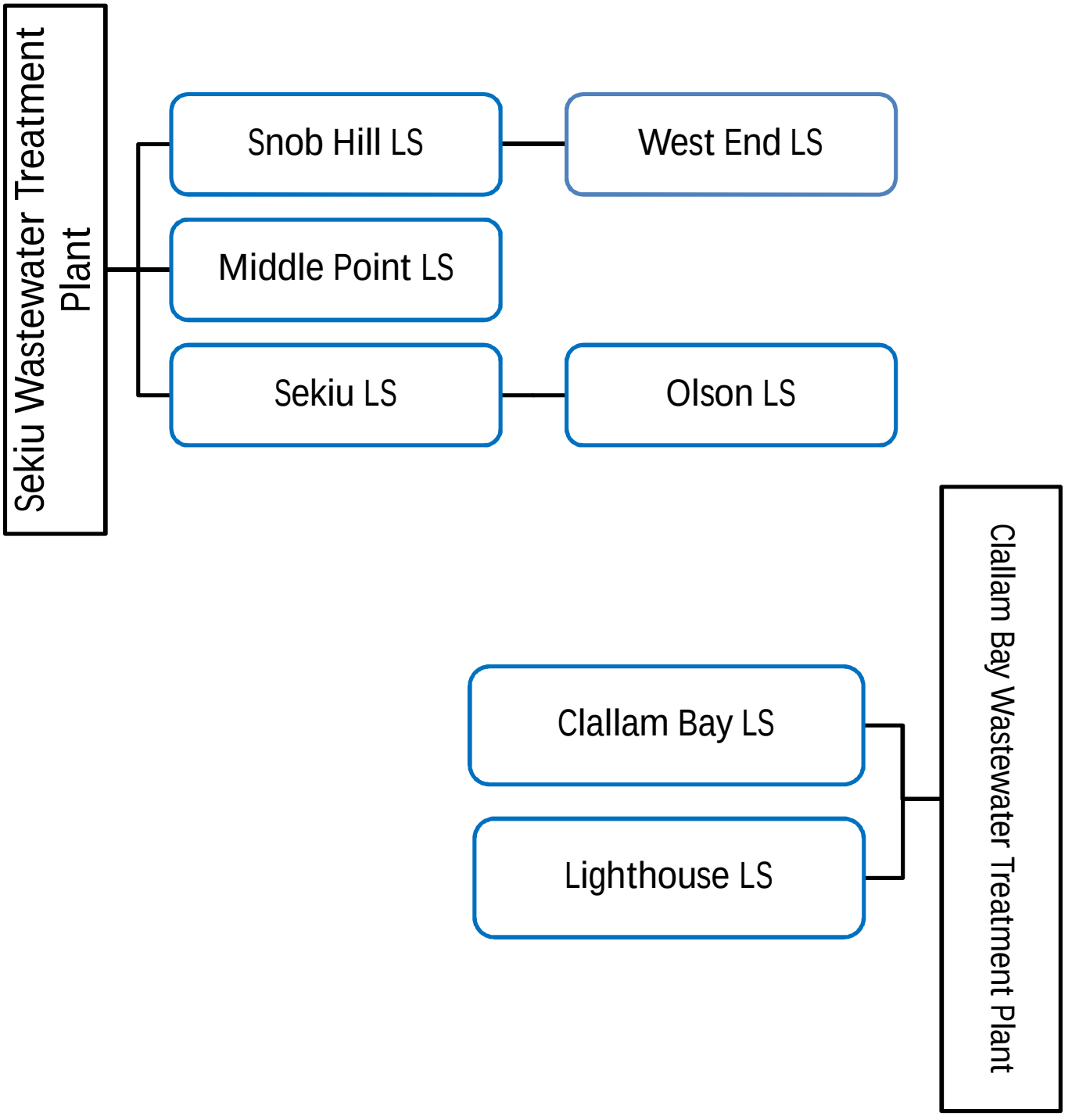
Pump controls and associated utility services are mounted in weather-tight enclosures at grade. The physical layout of the equipment differs slightly, but the stations are generally similar. Stations generally consist of a wet well with submersible pumps (or wet pit/dry pit for the Snob Hill and Clallam Bay lift stations), a check valve and isolation valve for each pump (within the wet well or dry pit with the exception of the West End LS which has a separate valve vault), and an above-grade cabinet enclosure for electrical power, bubbler and control equipment. The West End, Snob Hill, Middle Point, Clallam Bay and Olson Lift Stations also house a generator within a small building on-site. Most stations are equipped with a bypass connection and valving to allow the pumps and/or

wet well to be bypassed for maintenance or in an emergency. Only the Olson LS and Sekiu LS are equipped with security fencing.

All stations use control panels to control the pumps, monitor wet well level and other station parameters, and furnish basic status information and alarms. Wet well levels are detected using the bubbler system. None of the lift stations currently use variable frequency drives to modulate pump speed nor are any of the lift stations equipped with telemetry.

The pump controls monitor the station and will indicate if the bubbler system air supply has low pressure, if the lag pump is operated, if abnormal low/high water levels exist, if the submersible pump motor housing is leaking or if the dry well is flooding at the Snob Hill and Clallam Bay LS, if there is a power outage or there is a burned out lamp. These conditions are signaled by an amber light at the panel. Operators visit the station daily to ensure proper operation, to manually record pump run time data and to check for alarms.

All stations are equipped with permanent generators in the event of a power failure with the exception of the Sekiu LS and the Lighthouse LS. These two stations do not have a permanent generator as they located in close proximity to the wastewater treatment plants which offer primary and auxiliary power to the stations.



CLALLAM BAY/SEKIU GENERAL
SEWER/WASTEWATER FACILITIES PLAN

FIGURE 4-4
LIFT STATION FLOW SCHEMATIC

Gray & Osborne, Inc.

TABLE 4-2

Lift Stations and Force Mains

Pump Station	Westend LS	Snob Hill LS	Sekiu LS	Middle Point LS	Clallam Bay LS	Lighthouse Addition LS	Olson LS
Year Constructed	1977	1977	1977	1977	1977	1977	1990
Existing ERUs[2]	12	46	73	47	129	70	79[3]
Station Type	Submersible	Wet Pit/ Dry Pit	Submersible	Submersible	Wet Pit/ Dry Pit	Submersible	Submersible
Number of Pumps	2	2	2	2	2	2	2
Pump Manufacturer, Model	WEMCO Model S32	Smith & Loveless, 4C4A	WEMCO Model 4S3	WEMCO Model 4S3	Wemco Model EVP 4X 11S	WEMCO Model 4S3	Essco Model 493
Motor Size	5 hp	20 hp	5 hp	5 hp	7.5 hp	5 hp	5 hp
Wet Well Diameter	6 ft	6 ft	6 ft	6 ft	6 ft	6 ft	6 ft
Level Control	Bubbler	Bubbler	Bubbler	Bubbler	Bubbler	Bubbler	Bubbler
Depth to Bottom of Wet Well	11.6 ft	12.3 ft	22.7 ft	17.0 ft	12.3 ft	17.5 ft	5.5 ft
Lift Station Capacity[4], gpm	50 gpm	300 gpm	200 gpm	180 gpm	350 gpm	125 gpm	180 gpm
Total Dynamic Head (TDH)	44 ft	86 ft	31 ft	24 ft	27.5 ft	24 ft	[1]
Force Main Diameter	4"	8"	6"	6"	8"	4"	4"
Force Main, Length	1,730 ft	5,010 ft	360 ft	1,770 ft	2,770 ft	690 ft	180 ft
Force Main Material	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Flow Meter	No	No	No	No	No	No	No
Telemetry	No	No	No	No	No	No	No
Emergency Generator	Yes	Yes	No	Yes	Yes	No	Yes

(1) Data unavailable.
(2) Based on billed and currently non-billed ERUs.
(3) Presumes 1 ERU per each of the 70 RV hookups at Olson's Resort.
(4) Nominal capacity indicated; stations have not been tested to verify actual current capacity.

WASTEWATER TREATMENT PLANTS

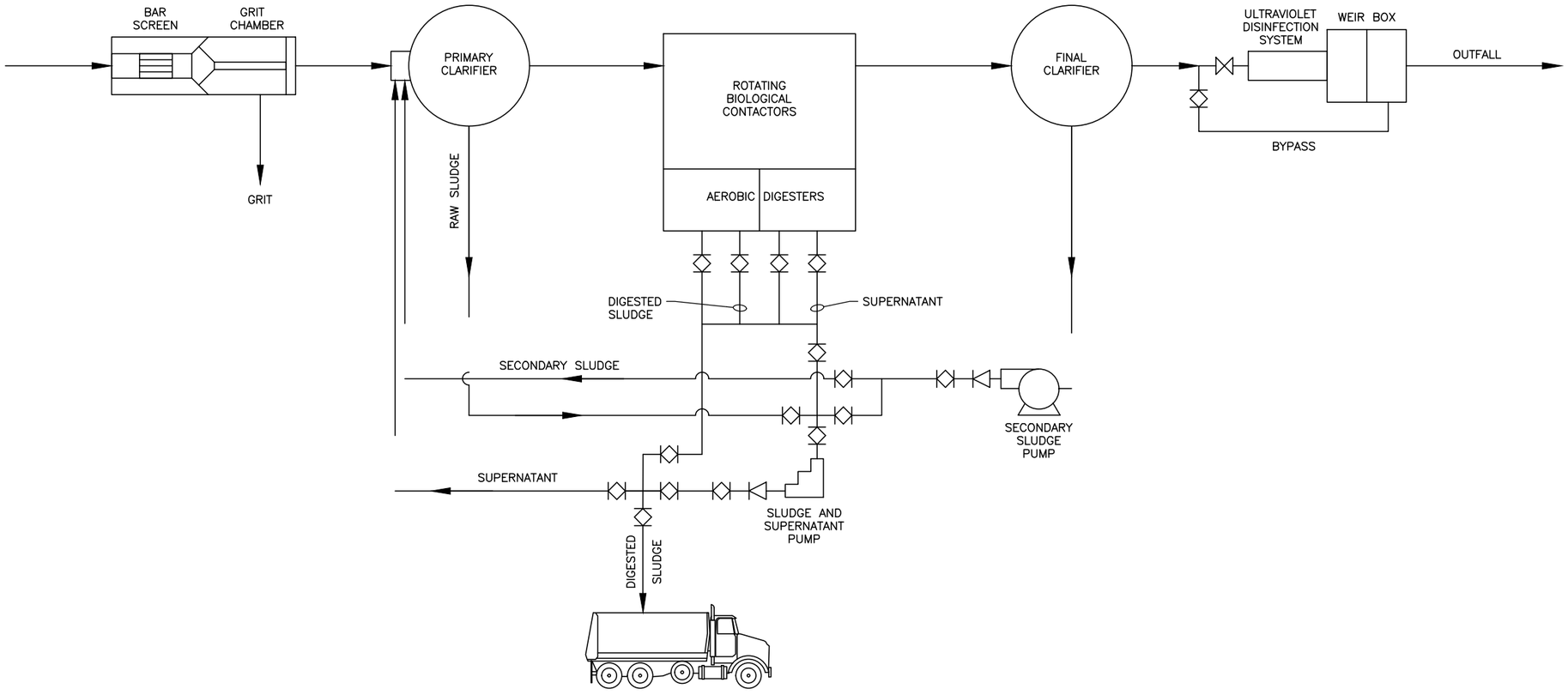
The Sekiu WWTP began operation in 1977 to treat the wastewater collected from the western half of Clallam Bay-Sekiu UGA from the unincorporated community of Sekiu. The Clallam Bay WWTP also began operation in 1977 where it treats the wastewater collected from the eastern half of the UGA from the unincorporated community of Clallam Bay.

The Sekiu and Clallam Bay WWTPs are similar in design and both use rotating biological contactors (RBCs) for biological treatment. The RBC media was replaced at both WWTPs in 1985. The chlorine disinfection system was replaced with an ultraviolet disinfection system at both WWTPs in 2004.

The WWTPs and their process units are described in detail in the following sections. The WWTP process flow diagrams are shown in Figure 4-5 and the WWTP site plans are shown in Figure 4-6. The WWTP hydraulic profile is shown in Figure 4-7.

EXISTING DESIGN CRITERIA AND NPDES PERMIT LIMITS

WWTP design loadings and effluent limits, as indicated in the existing NPDES permit for each facility, are shown in Table 4-3. Copies of the NPDES permits are included in Appendix B. The Sekiu WWTP NPDES permit was issued September 4, 2014 and expires September 30, 2019. The Clallam Bay WWTP NPDES draft permit was issued December 20, 2017 and has not yet been finalized. Ecology staff has noted that the permit may be issued with an effective date of December 1, 2018 or sooner if possible.



CLALLAM COUNTY

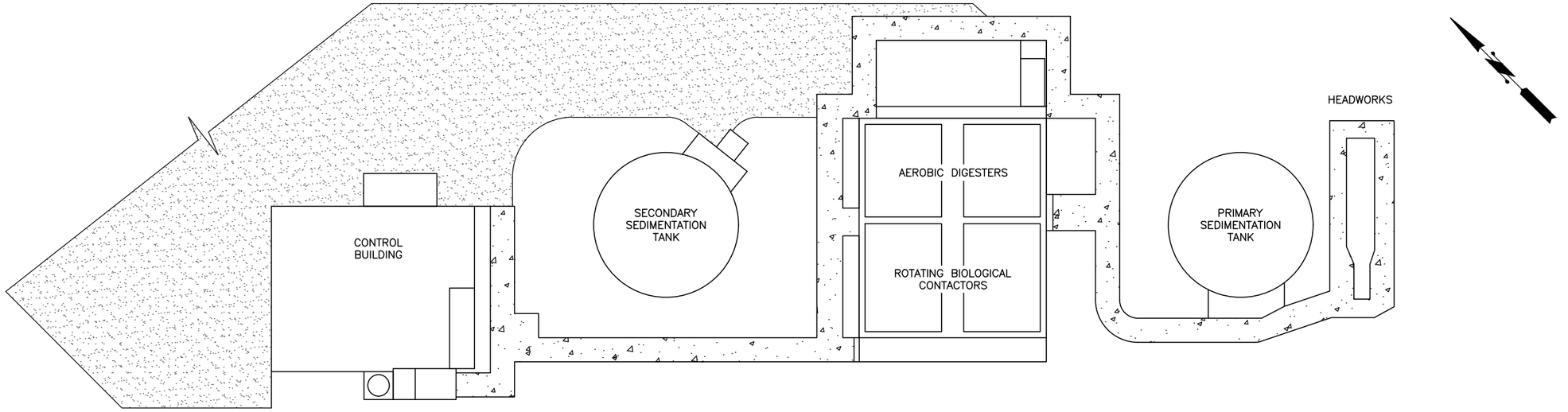
CLALLAM BAY/SEMIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 4-5

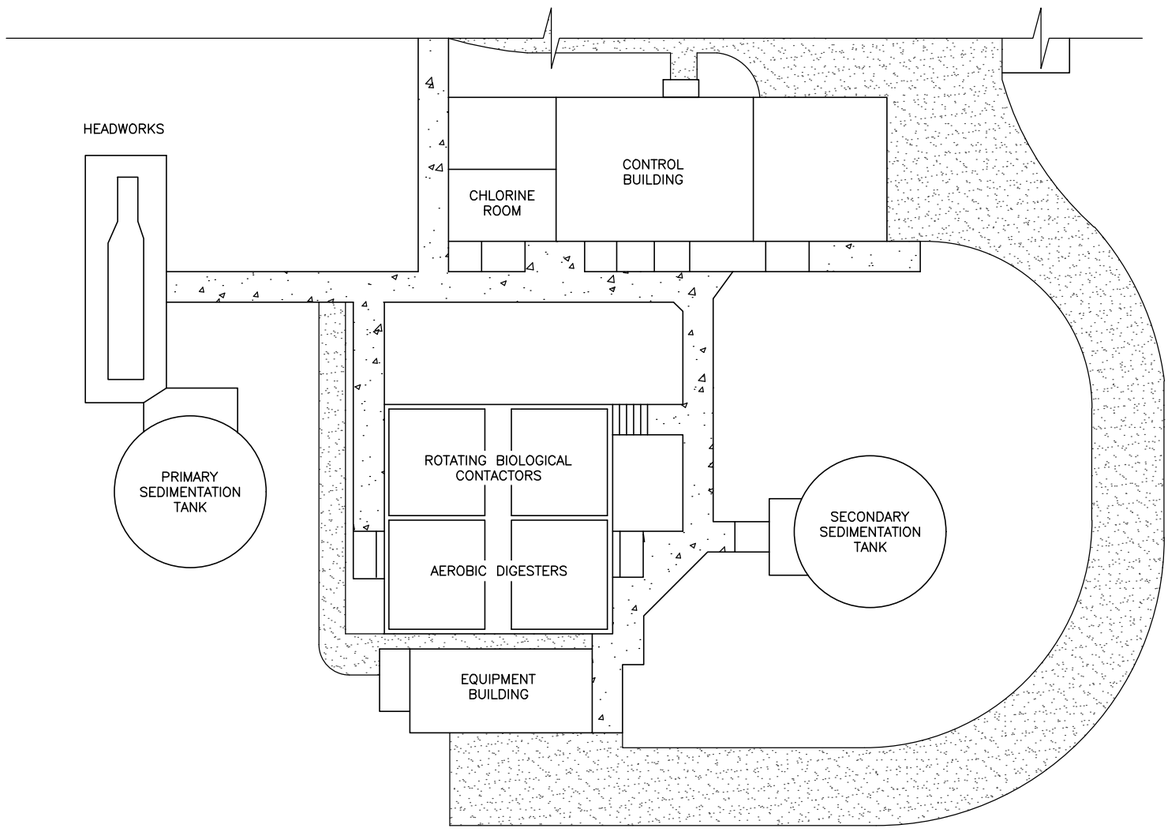
PROCESS FLOW DIAGRAM, SEKIU AND CLALLAM BAY

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\E-PFD.DWG



SEKIU WWTP SITE PLAN
SCALE: 1"=10'



CLALLAM BAY WWTP SITE PLAN
SCALE: 1"=10'

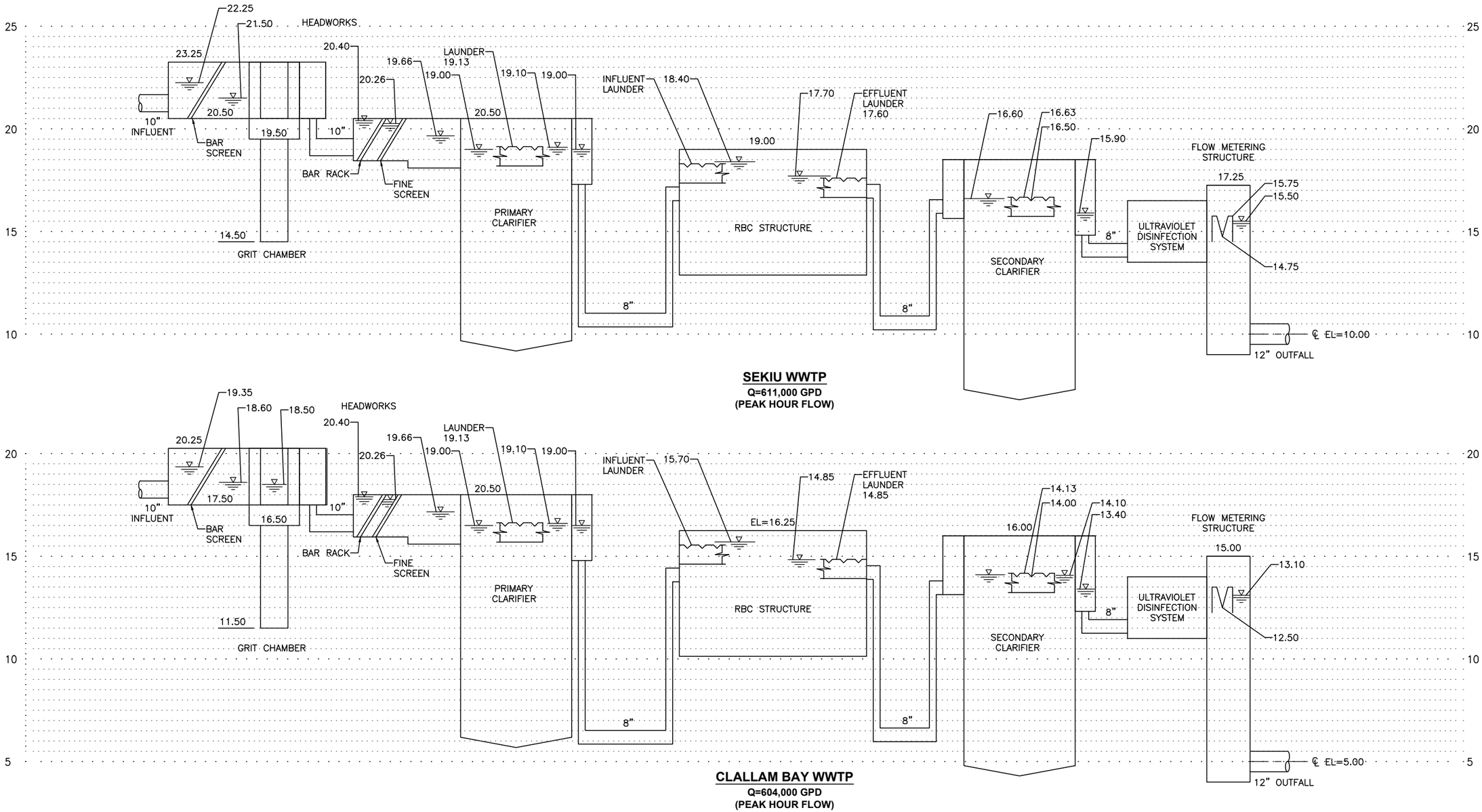
CLALLAM COUNTY
CLALLAM BAY/SEMIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 4-6

EXISTING SITE PLANS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\E-SITES.DWG



SEKIU WWTP
Q=611,000 GPD
(PEAK HOUR FLOW)

CLALLAM BAY WWTP
Q=604,000 GPD
(PEAK HOUR FLOW)

HYDRAULIC PROFILES
SCALE: VERT: 1"=5'-0", HORIZ: NOT TO SCALE

CLALLAM COUNTY
CLALLAM BAY/SEMIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 4-7

HYDRAULIC PROFILE, SEKIU AND CLALLAM BAY

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\E-HYD-PRO.DWG

TABLE 4-3

Existing WWTP Design Criteria and NPDES Permit Limits

Parameter	Seiku WWTP	Clallam Bay WWTP(1)
Design Flow (Maximum Month)	0.145 mgd	0.12 mgd
Influent BOD_5 Loading	135 lbs/day	135 lbs/day
Influent TSS Loading	171 lbs/day	171 lbs/day
Effluent Limits:		
BOD_5 Concentration (mo. avg.)	30 mg/L	30 mg/L
BOD_5 Concentration (wk. avg.)	45 mg/L	45 mg/L
BOD_5 Load (mo. Avg.)	20 lbs/day	20 lbs/day
BOD_5 Load (wk. avg.)	30 lbs/day	30 lbs/day
BOD_5 Removal	≥85% of Influent	≥85% of Influent
TSS Concentration (mo. avg.)	30 mg/L	30 mg/L
TSS Concentration (weekly avg.)	45 mg/L	45 mg/L
TSS Load (mo. Avg.)	26 lbs/day	26 lbs/day
TSS Load (wk. avg.)	39 lbs/day	39 lbs/day
TSS Removal	≥85% of Influent	≥85% of Influent
Fecal Coliform Count (mo. avg.)	200/100 mL	200/100 mL
Fecal Coliform Count (wk. avg.)	400/100 mL	400/100 mL
PH	$6.0 \leq pH \leq 9.0$	$6.0 \leq pH \leq 9.0$

(1) Limits based on draft permit.

DESCRIPTION OF PROCESS FLOW

A brief description of each unit process is presented in the sections below. Corresponding parameters and summary data for each major component of each unit process are also presented. In general, the process is virtually identical for both the Sekiu and Clallam Bay WWTPs. The major differences in each process component between the two WWTPs are discussed where applicable.

Headworks

The headworks consists of a manually cleaned bar screen with 1-5/8-inch openings followed by two parallel channels with manually cleaned bar screens with 1/2-inch openings. The screens remove rags, and large debris that may damage process units downstream if not removed. The screens are followed by manually cleaned grit removal channels equipped with sutro weirs to control the velocity. Each channel has manual stop gates to alternate flow between each fine screen and grit channel. Samples of the influent are collected from the sump immediately downstream of the grit channels and conveyed via suction through tubing to a refrigerated automatic sampler.

Table 4-4 presents the design criteria for the headworks.

TABLE 4-4

Headworks Design Criteria

Coarse Screen 1	
Quantity	1
Type	Manually Cleaned
Aperture	1-5/8"
Coarse Screen 2	
Quantity	2
Type	Manually Cleaned
Aperture	1/2"
Influent Sampler	
Manufacturer/Model	ISCO 3710
Quantity	1
Type	Timer-Based
Grit Channel	
Quantity	2
Dimensions	18' x 1' x 1'

Primary Clarifiers and Primary Sludge Pumps

Both Sekiu and Clallam Bay WWTPs each have one circular primary clarifier with perimeter feed and center withdrawal. A comminutor was originally installed at the headbox of each of the primary clarifiers but they have been removed due to equipment failure. The clarifiers have a 9-foot sidewater depth and 1.5 feet of freeboard with a diameter of 22 feet at Seiku and 18 feet at Clallam Bay.

The settled primary scum and sludge is conveyed to a hopper at the center of the clarifier by scraper arms suspended from a drive shaft. The drive, gear box, and spur gear for the rake arm assembly are mounted on the bridge. The sludge flows are pumped via the sludge and supernatant pump through glass lined ductile iron pipe to the digesters. The progressing cavity pump runs on a timer for a few minutes every hour and is also operated in hand to manually lower the sludge blanket once a day during the daily clarifier washdown process.

Scum can be skimmed off the surface with surface water sprayers or manual hose spray to direct the scum to a slotted pipe mechanism. By design, the scum flows to the attached headbox. Glass-lined ductile iron pipe conveys the scum by gravity or the sludge and supernatant pump to the digesters.

The original equipment manufacturer for the Spiroflow Clarifiers is Lakeside Equipment Corporation. Table 4-5 presents the design criteria for the primary clarifiers.

TABLE 4-5

Primary Clarifier Design Criteria

Primary Clarifier	
Quantity	1
Type	Circular, Perimeter Feed-Center Withdrawal
Diameter	Sekiu: 22 feet Clallam Bay : 18 feet
Volume	Sekiu: 25,650 gallons Clallam Bay: 17,100 gallons
Side Water Depth	9 feet
Manufacturer/Model	Lakeside Equipment Corporation/Spiroflow
Drive	
Manufacturer/Model	Reliance/Winsmith
Gear Reducer	Double Reduction 5MCVDO
Motor	3/4-hp
Primary Sludge and Scum Pump	
Quantity	1
Type	Progressing Cavity
Capacity	Sekiu: 50 gpm @ 20 psi Clallam Bay: 40 gpm @ 20 psi
Manufacturer/Model	Moyno

Rotating Biological Contactors (RBCs)

Aerated primary effluent flows by gravity to two rotating biological contactor (RBC) units operating in parallel. Each shaft supports plastic disk media. The Sekiu WWTP RBC has a total surface area of 165,000 square feet. The Clallam Bay WWTP RBC has a total surface area of 50,000 square feet. A film of bacteria attaches to the surface of the partially submerged disks and provides secondary treatment by breaking down organic matter in the sewage. The mass of the biofilm determines the BOD_5 capacity of the plant and the mass of the biofilm is dependent on the surface area of the disk media.

The RBC shafts are rotated through the water using a motorized drive and gear reducer.

Each unit is covered by a removable fiberglass enclosure that retains heat and prevents algae growth in the tanks.

Table 4-6 presents the design criteria for the rotating biological contractors.

TABLE 4-6

Rotating Biological Contactors Design Criteria

Rotating Biological Contactors		
Facility	Sekiu	Clallam Bay
Quantity	2	2
Media Area	165,000 ft^2	50,000 ft^2
Stages	2	2
Speed		
Drive Motor	3 hp Reliance	3 hp Reliance
Gear Reducer	Dodge No. 188C	Dodge No. 188C
Manufacturer/Model	Walker Process Control/BioSpiral	Walker Process Control/BioSpiral

Secondary Clarifiers and Secondary Sludge Pumps

Secondary clarification follows the biological treatment in the RBCs. The single secondary clarifier configuration at both WWTPs is identical to the primary clarifier configuration with peripheral feed and center withdrawal units. Both secondary clarifiers have a 9-foot sidewater depth and 1.5-feet of freeboard with a diameter of 22 feet at Seiku and 18 feet at Clallam Bay.

The settled secondary scum and sludge is conveyed to a hopper at the center of the clarifier by scraper arms suspended from a drive. The drive, gear box, and spur gear for the rake arm assembly are mounted on the bridge. The sludge is pumped via the sludge and supernatant pump through cement mortar lined ductile iron pipe to the digesters. The pump runs on a timer for a few minutes every hour and is also operated in hand to manually lower the sludge blanket once a day during the daily clarifier wash down process. The secondary sludge can also be pumped to the primary clarifier by operating valves in the Equipment Building.

Scum can be skimmed off the surface with surface water sprayers or manual hose spray to direct the scum to a slotted pipe mechanism. By design, the scum flows to the attached headbox. Glass lined ductile iron pipe conveys the scum by gravity or the sludge and supernatant pipe to the digesters.

The original equipment manufacturer for the Spiroflow Clarifiers is Lakeside Equipment Corporation. Table 4-7 presents the design criteria for the secondary clarifier and secondary sludge pump.

TABLE 4-7

Secondary Clarifier and Sludge Pump Design Criteria

Secondary Clarifiers	
Quantity	1
Type	Circular, Perimeter Feed-Center Withdrawal
Diameter	Sekiu: 22 feet Clallam Bay: 18 feet
Volume	Sekiu: 25,650 gallons Clallam Bay: 17,100 gallons
Side Water Depth	9 feet
Manufacturer/Model	Lakeside Equipment Corporation/Spiroflow
Clarifier Drives	
Manufacturer/Model	Reliance/Winsmith
Gear Reducer	Double Reduction 5MCVDO
Motor	3/4-hp
Secondary Sludge Pumps	
Quantity	1
Type	Vertical, centrifugal, wet pit
Capacity	Sekiu: 45 gpm @ 7 feet TDH Clallam Bay: 30 gpm @ 8 feet TDH

UV Disinfection Systems

Effluent from the secondary clarifiers flows by gravity to the UV disinfection system. The UV disinfection system at each plant is a Trojan UV3000 PTP. The UV disinfection system has low pressure, low intensity high intensity ultraviolet lamps positioned within the flow of wastewater in parallel stainless-steel channels, each equipped with upstream and downstream isolation valves. Normally, one channel and reactor tank is operated at a time. The water flows through the tank and is exposed to the lamps which apply the required UV dose to deactivate the bacteria. A weir at the outlet of the channel maintains the water level so that all of the lamps are continuously submerged. The disinfected effluent flows by gravity to the outlet structure. An ultrasonic level transducer senses the water level at a V-notch weir in the outlet structure to measure the effluent flow rate. The effluent then flows by gravity to the outfall.

Table 4-8 presents the design criteria for the UV disinfection system and the effluent flow meter and sampler.

TABLE 4-8

Disinfection Systems, Effluent Flow Meter, and Effluent Sampler Design Criteria

UV Disinfection	
Manufacturer/Model	Trojan Technologies, Inc./UV 3000 PTP
Number of Channels	2
Number of Lamps	Two Modules with 3 Banks of 2 lamps each, 6 lamps each module, 12 lamps total
Capacity	Not Available
Design UVT	Not Available
Design Dose	Not Available
UV bulb lifetime	8,760 hours of runtime
Effluent Flow Meter	
Manufacturer/Model	Siemens HydroRanger 200
Quantity	1
Type	Ultrasonic
Effluent Sampler	
Manufacturer/Model	ISCO/3710
Quantity	1
Type	Automatic Refrigerated

Outfall

Both Seiku and Clallam Bay WWTPs are equipped with gravity outfalls. The outfalls convey the disinfected, metered and sampled effluent to Clallam Bay in the Strait of Juan de Fuca. The Sekiu WWTP outfall discharge is located near Sekiu Point and the Clallam Bay WWTP outfall discharge is located near Slip Point.

The Clallam Bay WWTP outfall is 14 inches in diameter and approximately 1,200 feet in length. The outfall is equipped with a 46-foot long diffuser with nine 4-inch ports 5 feet apart at the pipe spring line. The diffuser is located in approximately 26 feet of water depth at MLLW.

The Sekiu WWTP outfall is 12 inches in diameter and approximately 520 feet in length. The end of the outfall is in a "T" style diffuser that is approximately 3-feet wide and has a 12-inch port at each end of the "T." The outfall is located in approximately 16 feet of water depth at MLLW.

Table 4-9 presents the design criteria for the outfall.

TABLE 4-9

Outfall Design Criteria

Outfall	
Pipe Length	Sekiu: 520 ft Clallam Bay: 1,200 ft
Pipe Diameter	Sekiu: 12 inches Clallam Bay: 14 inches

Aerobic Digesters

Primary and secondary sludge and scum are pumped to two aerobic digesters at each plant. The digesters at Clallam Bay have a total volume of 20,400 gallons total and the digesters at Sekiu have a total volume of 33,000 gallons total. Coarse bubble diffusers provide aeration to the digesters. Air is supplied by two blowers at each WWTP.

The digesters are decanted manually by operators using a trash pump. Supernatant is pumped to the primary clarifier. The operators manually add polymer to the digesters to enhance solids settling prior to decanting.

The operators report that at the Clallam Bay WWTP, digested sludge is hauled offsite twice per month during the summer months and once per month during the rest of the year. At the Sekiu WWTP, digested sludge is hauled offsite approximately every 2 months. Sludge is pumped to a 6,000-gallon capacity truck, which hauls the biosolids to Port Angeles for further processing.

Table 4-10 presents the design criteria for the aerobic digesters.

TABLE 4-10

Aerobic Digester Design Criteria

Aerobic Digester	
Quantity	2 each WWTP
Basin Dimensions	31' x 31' x 11'
Basin Volume	Sekiu: 33,000 gallons Clallam Bay: 20,400 gallons
Aeration Blowers	
Manufacturer/Model	Roots/56 URAI
Quantity	2
Capacity	Sekiu: 140 scfm Clallam Bay: 275 scfm
Motor Power	5 hp

Non-Potable Washwater System

Disinfected plant effluent is pumped by two inline centrifugal non-potable water pumps to the non-potable pressurized water tank at each WWTP. The intake line to the pumps is equipped with a 2-inch single cylinder screen Hellan Type S strainer with a hand operated sediment scraper bar. The sediment collected in the bowl can be flushed out the drain line to the downstream side of the weir.

The pressurized tank is supplied with compressed air from the plant air compressor. The tank has 430 gallons of storage capacity and is manufactured by Seattle Boiler Works. The tank is a 100 psi ASME code tanks with a safety blow off valve set for 100 psi. The non-potable water system provides water to the wash down hoses, and spray bars for the primary and secondary clarifiers. Table 4-11 presents the design criteria for the non-potable washwater system.

TABLE 4-11

Non-Potable Water Design Criteria

Non-Potable Water	
Pressurized Vessel Volume	430 gallons nominal
Pumps	
Manufacturer/Model	PACO/13270-5
Quantity	2
Capacity	60 gpm @ 105 feet TDH
Motor Size	3 hp

Electrical Service/Auxiliary Generator

The WWTPs each have a grounded 120/240 volt, 3 phase, 4 wire delta system. The underground service from Clallam County PUD is metered at the pole-mounted current transformer and meter cabinet. Power is routed to the "Normal-Power, Main Circuit Breaker" located in the distribution panel within the Control Room at each WWTP. Clallam Bay has a 300-amp service and Sekiu has a 250-amp rated service. A 60 Hz 50-kW generator and automatic transfer switch provides backup power to the plant with the exception of room and water heaters.

Table 4-12 presents the design criteria for the emergency power generator criteria.

TABLE 4-12

Emergency Power Generator Design Criteria

Emergency Power Generator	
Manufacturer/Model	Cummins Onan/DGCA-5554838
Quantity	1
Capacity	50 kW
Engine	Cummins 6-cylinder
Fuel	Diesel, 50 gallons storage in sub-base tank

Process Controls and Telemetry

Each WWTP utilizes an analog electro-mechanical based control systems. There is no HMI or SCADA system. Flow is recorded with pen and paper on a circle chart plotter. The WWTPs are not equipped with autodialers. During after-hours power outages, by procedure, the operators visit the WWTPs to verify that the generators are running.

CHAPTER 5

EXISTING AND PROJECTED WASTEWATER FLOWS AND CHARACTERISTICS

INTRODUCTION

In this chapter, the existing wastewater characteristics for the Clallam Bay/Sekiu service area will be analyzed and projections made for future conditions.

Appropriate design of wastewater treatment and conveyance facilities requires the determination of the current and future quantity and quality of wastewater generated from each of the contributing sources. In Clallam Bay and Sekiu, wastewater is predominantly domestic in origin, with lesser amounts contributed by commercial businesses and by public use facilities such as schools, parks, hospitals, and municipal functions. Additionally, infiltration and inflow (I/I) contributions result from groundwater and surface water entering the sewer system during periods of high groundwater levels and rainfall, respectively, as occurs in many other communities in Washington.

DEFINITIONS OF TERMS

The terms and abbreviations used in the analysis are described below, listed in alphabetical order.

AVERAGE ANNUAL FLOW

Average annual flow is the average daily flow over a calendar year. This flow parameter is used to estimate annual operation and maintenance costs for treatment and lift station facilities.

AVERAGE DRY WEATHER FLOW

Average dry weather flow is wastewater flow during periods when the groundwater table is low and precipitation is at its lowest of the year. The dry weather flow period in much of Washington normally occurs during June through September. During this time, the wastewater strength is highest, due to the lack of dilution with the ground and surface water components of infiltration and inflow. The higher strength coupled with higher temperatures and longer detention times in the sewer system create the greatest potential for system odors during this time. The average dry weather flow is the average daily flow during the three lowest consecutive flow months of the year. For this study, average flows for July, August, and September are used.

BASE FLOW

Base flow is wastewater flow without any inflow or infiltration (defined below). Average base flow is often determined from the influent flow charts during the driest summer months. Typically, base flow values are slightly lower than the average dry weather flow because the base flow is not an average over the summer months but the lowest flow during dry summer days. Clallam Bay and Sekiu are somewhat unusual in that base flow varies ***substantially*** throughout the year and would be expected to peak during summer fishing season.

BIOCHEMICAL OXYGEN DEMAND

Biochemical oxygen demand (BOD) is a measure of the oxygen required by microorganisms in the biochemical oxidation (digestion) of organic matter. BOD is an indicator of the organic strength of the wastewater. If significant quantities of organic compounds are discharged untreated to the environment, biodegradable organics will deplete natural oxygen resources and result in the development of septic (anaerobic) conditions. BOD data together with other parameters are used in the sizing of the treatment facilities and provide a measurement for determining the effectiveness of the treatment process. BOD is expressed as a concentration in terms of milligrams per liter (mg/L) and as a load in terms of pounds per day (lb/day). The term BOD typically refers to a 5-day BOD, often written BOD_5, since the BOD test protocol requires 5 days for completion. BOD_5 of a wastewater is composed of two components – a carbonaceous oxygen demand ($CBOD_5$) and a nitrogenous oxygen demand ($NBOD_5$). The use of $CBOD_5$ as a parameter for evaluating wastewater strength removes the influence of nitrogenous components, including ammonia and organic nitrogen.

CHLORINE

Chlorine is a chemical compound that acts as a strong oxidant. Chlorine is widely used as a disinfectant in wastewater treatment and is available both in gaseous (elemental chlorine) and solution forms (hypochlorite). Chlorine is a toxic chemical and is lethal to aquatic biota if present in too high a concentration. Additionally, some organic constituents may react with the chlorine to interfere with chlorination or form toxic compounds, such as chloroform, that can have long-term adverse effect on the beneficial uses of the waters to which they are discharged. To minimize the effects of potentially toxic chlorine residuals on the environment, it is sometimes necessary to dechlorinate wastewater treated with chlorine or substitute alternative disinfection systems such as ultraviolet disinfection. The Clallam Bay and Sekiu wastewater treatment plants (WWTPs) use ultraviolet disinfection.

CONTAMINANTS OF CONCERN

Contaminants of concern in wastewater, in addition to chlorine, BOD, and total suspended solids discussed elsewhere in this section, include nutrients, priority pollutants, heavy metals, and dissolved organics.

Nutrients, such as nitrogen and phosphorus along with carbon, are essential requirements for growth. When discharged to the aquatic environment, these nutrients can lead to the growth of undesirable aquatic life. When discharged in excessive amounts on land, they can also lead to the pollution of groundwater. Additionally, when nutrients, particularly ammonia, are in too high a concentration they can be toxic to aquatic life.

Priority pollutants are organic and inorganic compounds selected on the basis of their known or suspected carcinogenicity, mutagenicity, teratogenicity, or high acute toxicity. Many of these compounds are found in wastewater. Inorganic constituents, including heavy metals, are often present in wastewater due to commercial and industrial activities and may have to be removed if the presence of the metals will adversely affect the receiving water, or if the wastewater is to be reused. Some heavy metals (most notably copper) can be present in wastewater due to leaching from drinking water pipes.

DOMESTIC WASTEWATER

Domestic wastewater is wastewater generated from single- and multi-family residences, permanent mobile home courts, and group housing facilities such as nursing homes. Domestic wastewater flow is generally expressed as a unit flow based on the average contribution from each person per day. The unit quantity is expressed in terms of gallons per capita per day (gpcd).

EQUIVALENT RESIDENTIAL UNIT

An equivalent residential unit (ERU) is a baseline wastewater generator that represents the average single-family residential household. An ERU can also express the average annual flow contributed by a single-family household in units of gallons per day, or an annual average loading (of 5-day biochemical oxygen demand or total suspended solids) contributed by a single-family household in units of pounds per day.

INFILTRATION

Infiltration is groundwater entering a sewer system by means of defective pipes, pipe joints, or manhole walls. Infiltration quantities exhibit seasonal variation in response to groundwater levels. Storm events or irrigation trigger a rise in the groundwater levels and increase infiltration. The greatest infiltration is observed following significant storm events or prolonged periods of precipitation. Since infiltration is related to the total amount of piping and appurtenances in the ground and not to any specific water use

component, it is often expressed in terms of the total land area being served. The unit quantity generally used is gallons per acre per day (gpad) or gallons per capita per day.

INFLOW

Inflow is surface water entering the sewer system from yard, roof and footing drains, from cross connections with storm drains, and through holes in manhole covers. Peak inflow occurs during heavy storm events when storm sewer systems are taxed beyond their capacity, resulting in hydraulic backups and local ponding. Inflow, like infiltration, can be expressed in terms of gallons per capita day or gallons per acre per day.

WWTP flow records are utilized to characterize combined I/I in the system in terms of peak hour, peak day, maximum month, and average annual I/I.

MAXIMUM MONTH FLOW (TREATMENT DESIGN FLOW)

Maximum month flow is the highest monthly flow during a calendar year. The maximum month flow normally occurs in the winter due to the presence of more I/I. This wintertime flow is composed of the normal domestic, commercial, and public use flows with significant contributions from inflow and infiltration. The predicted maximum month flow at the end of the design period is used as the design flow for sizing treatment processes and selecting treatment equipment.

NON-RESIDENTIAL WASTEWATER

Non-residential wastewater is wastewater generated from commercial activities, such as restaurants, retail and wholesale stores, service stations, and office buildings, and industrial flow (process wastewater, rinse water, and other industrial activities). Non-residential wastewater quantities for commercial and industrial wastewater are expressed in this Plan in terms of ERUs.

PEAK HOUR FLOW

Peak hour flow is the highest hourly flow during a calendar year. The peak hour flow usually occurs in response to a significant storm event preceded by prolonged periods of rainfall which results in a high groundwater table in the service area. Peak hour flows are used in sizing the hydraulic capacity of wastewater collection, treatment, and pumping components. Peak hour flow is typically determined from treatment facility flow records and projected future flows.

SUSPENDED SOLIDS

Suspended solids are the solid matter carried in the waste stream. The total suspended solids (TSS) in a wastewater sample are determined by filtering a known volume of the sample, drying the filter paper, and measuring the increase in weight of the filter paper.

TSS is expressed in the same terms as BOD; milligrams per liter for concentration and pounds per day for mass load. The amount of TSS in the wastewater is used in the sizing of treatment facilities and provides another measure of the treatment effectiveness. The concentration of TSS in wastewater affects the treatment facility biosolids production rate, treatment and storage requirements, and ultimate disposal requirements.

WASTEWATER

Wastewater is water-carried waste from residential, business, industry, and public use facilities, together with quantities of groundwater and surface water which enter the sewer system through defective piping and direct surface water inlets. The total wastewater flow is quantitatively expressed in millions of gallons per day (mgd).

EXISTING WASTEWATER FLOWS AND LOADING

WWTP records for the 5-year period from 2013 through 2017 were reviewed and analyzed to determine current wastewater characteristics and influent loadings for the two collection systems. Current wastewater flows and loadings were then used in conjunction with projected population data to determine projected future wastewater flows and loadings.

WASTEWATER FLOWS FOR CLALLAM BAY AND SEKIU WWTPS

Tables 5-1 and 5-2 summarize reported WWTP influent flows for the 5-year period from 2013 to 2017 in millions of gallons per day. The monthly average influent WWTP flows for Clallam Bay ranged from 0.019 to 0.063 mgd, while those from Sekiu ranged from 0.019 to 0.156 mgd.

Both WWTPs monitor effluent flow (the flow discharged to the outfall) and do not directly measure influent flow (the flow entering the WWTP). In general, for the purposes of this Plan, the effluent flow is assumed to equal the influent flow. In reality, there will be some dampening of the instantaneous peak flows but otherwise, this is a reasonable assumption, especially for annual average, maximum month, and peak day flows. For peak hour, the use of effluent flow as an estimate of influent flow is more problematic. In addition to dampening, effluent flows can be decreased relative to influent when the capacity of the pipes within the plant is exceeded, and flow backs up in the WWTP. This occurs fairly frequently at the Sekiu WWTP, but not at the Clallam Bay WWTP. Also, digester decant flows can ***increase*** instantaneous effluent flows relative to influent.

As shown in Table 5-1 and on Figure 5-1 for the Clallam Bay WWTP, the NPDES permitted influent maximum month flow capacity of 0.12 mgd has not been exceeded. The highest monthly average influent flow over the period from 2009 to 2016 was 0.063 mgd and it occurred in December 2015. The peak day flow over the period was 0.145 mgd.

As shown in Table 5-2 and on Figure 5-2, the Sekiu WWTP NPDES permitted maximum month flow capacity of 0.145 mgd was exceeded once (in December 2015), with a flow of 0.156 mgd. In addition, the NPDES maximum month limit has nearly been exceeded in several other months and peak day flows have exceeded 0.4 mgd several times.

Average Base Sanitary Flows (Non-Tourist Season)

The average base sanitary flows for Clallam Bay and Sekiu are 0.024 and 0.023 mgd, respectively. These values are determined by averaging flows for the recent months of May and June when precipitation was the lowest. The average flows for these months is used to quantify the average base sanitary flows since the summer seasonal population has not peaked, and precipitation and I/I are relatively insignificant. Clallam Bay and Sekiu experience a very large population increase during the summer months due to tourists and seasonal residents.

Peak Hour Flows

The estimated peak hour effluent flows are based on review of effluent circular flow charts from the WWTPs and estimated to be 0.388 mgd for Clallam Bay (October 15, 2016), and 0.857 mgd for Sekiu (December 9, 2015). As discussed above, use of effluent flows to estimate influent flow for peak hour conditions can be problematic, especially for Sekiu, due to dampening, surcharging, and periodic decant flows within the plant. An estimate of 0.388 mgd would appear to be a reasonable peak hour influent flow at the Clallam Bay WWTP; however, the peak hour influent flow at the Sekiu WWTP is certain to be much higher than the 0.857 mgd effluent flow measured. The biggest factor in this discrepancy at Sekiu is that during periods of intense prolonged precipitation, the effluent flow will stay quite constant at 0.75 to 0.90 mgd due to downstream pipe capacity restrictions and the primary and secondary clarifiers will surcharge. Based on hydraulic calculations for the upstream and downstream piping, and observations of the clarifier surcharging, it is estimated that the peak hour influent flow for the Sekiu WWTP is 1.4 mgd.

TABLE 5-1

Historical WWTP Influent Flows for Clallam Bay WWTP (2013 to 2017)

	2013 (mgd)	2014 (mgd)	2015 (mgd)	2016 (mgd)	2017 (mgd)	Average (mgd)	Permit (mgd)
Average Dry Weather Flow (1)	0.027	0.025	0.026	0.024	0.020	0.024	—
Annual Average Flow	0.027	0.035	0.036	0.040	0.033	0.034	—
Maximum Monthly Flow	0.031	0.050	0.063	0.062	0.053	0.052	0.120
Peak Day Flow	0.070	0.128	0.128	0.145	0.134	0.121	—

(1) Average of July, August, and September.
(2) Average base sanitary flows in the non-tourist season (i.e., outside of the summer months) are estimated to be 0.024 mgd.

TABLE 5-2

Historical WWTP Influent Flows for Sekiu WWTP (2013 to 2017)

	2013 (mgd)	2014 (mgd)	2015 (mgd)	2016 (mgd)	2017 (mgd)	Average (mgd)	Permit (mgd)
Average Dry Weather Flow (1)	0.049	0.033	0.039	0.026	0.023	0.034	—
Annual Average Flow	0.060	0.070	0.070	0.075	0.063	0.067	—
Maximum Monthly Flow	0.101	0.116	0.156	0.137	0.133	0.129	0.145
Peak Day Flow	0.426	0.519	0.445	0.462	0.426	0.456	—

(1) Average of July, August, and September.
(2) Average base sanitary flows in the non-tourist season (i.e., outside of the summer months) are estimated to be 0.023 mgd.

Monthly Discharge Monitoring Report (DMR) data for this period are provided in Appendix D and summarized in Tables 5-3 and 5-4. Graphical representations of average and peak day monthly WWTP flows for the period from 2013 through 2017 for the Clallam Bay and Sekiu WWTPs are shown on Figures 5-1 and 5-2, respectively.

TABLE 5-3

Summary of Discharge Monitoring Reports – Clallam Bay WWTP

	Flow (Effluent)		Influent		Effluent									
Date	Avg. Month Flow (mgd)	Peak Day Flow (mgd)	Avg. Month BOD (lb/day)	Avg. Month TSS (lb/day)	Weekly Avg. BOD (mg/L)	Monthly Average BOD (mg/L)	Monthly Average BOD Removal (%)	Weekly Avg. TSS (mg/L)	Monthly Average TSS (mg/L)	Monthly Average TSS Removal (%)	Weekly Average Fecal Coliform (#/100 mL)	Monthly Average Fecal Coliform (#/100 mL)	pH (Min. Month)	pH (Max. Month)
Jan-13	0.027	0.065	48	44	17	14	93	21	17	91	152	25	6.0	6.6
Feb-13	0.02	0.036	35	30	16	16	93	20	19	90	367	6	6.0	6.6
Mar-13	0.031	0.049	38	32	18	17	88	25	22	81	34	18	6.0	6.9
Apr-13	0.027	0.042	35	28	14	12	94	17	13	91	52	13	6.1	6.9
May-13	0.027	0.038	52	42	17	15	94	20	15	93	45	9	6.0	6.8
Jun-13	0.025	0.037	48	42	12	11	96	15	11	95	143	59	6.1	6.6
Jul-13	0.026	0.033	58	46	13	11	96	12	9	96	98	24	6.2	6.6
Aug-13	0.024	0.04	49	41	14	11	96	18	12	95	103	64	6.2	7.5
Sep-13	0.03	0.07	55	46	16	13	96	14	11	95	110	37	6.3	6.9
Oct-13	0.03	0.049	48	42	17	13	94	15	11	94	277	43	6.4	6.9
Nov-13	0.031	0.047	47	37	17	15	92	20	15	91	143	46	6.5	6.8
Dec-13	0.026	0.035	44	34	13	12	94	15	13	92	130	22	6.0	6.7
Jan-14	0.036	0.077	49	39	13	12	94	16	15	91	135	31	6.0	6.6
Feb-14	0.043	0.069	59	47	18	16	90	18	16	88	129	12	6.0	6.4
Mar-14	0.05	0.089	57	44	19	15	90	22	18	84	40	18	6.0	6.6
Apr-14	0.036	0.052	47	37	14	12	93	17	15	90	51	19	6.0	6.7
May-14	0.028	0.051	45	41	11	9	96	16	12	95	230	19	6.0	6.7
Jun-14	0.021	0.032	37	33	14	13	95	23	19	92	115	24	6.1	6.9
Jul-14	0.025	0.036	44	37	12	11	95	13	10	95	114	21	6.1	6.7
Aug-14	0.025	0.033	46	40	13	12	95	14	12	95	200	67	6.2	6.5
Sep-14	0.026	0.036	65	56	14	13	96	16	14	95	64	15	6.1	6.6
Oct-14	0.037	0.065	55	52	14	12	94	16	13	93	250	57	6.0	6.6
Nov-14	0.043	0.078	52	42	12	11	93	15	15	89	60	6	6.1	6.6
Dec-14	0.05	0.128	55	48	13	12	92	20	15	88	134	16	6.0	6.5

TABLE 5-3 (continued)

Summary of Discharge Monitoring Reports – Clallam Bay WWTP

	Flow (Effluent)		Influent		Effluent									
Date	Avg. Month Flow (mgd)	Peak Day Flow (mgd)	Avg. Month BOD (lb/day)	Avg. Month TSS (lb/day)	Weekly Avg. BOD (mg/L)	Monthly Average BOD (mg/L)	Monthly Average BOD Removal (%)	Weekly Avg. TSS (mg/L)	Monthly Average TSS (mg/L)	Monthly Average TSS Removal (%)	Weekly Average Fecal Coliform (#/100 mL)	Monthly Average Fecal Coliform (#/100 mL)	pH (Min. Month)	pH (Max. Month)
Jan-15	0.046	0.081	49	34	13	12	92	16	14	87	29	9	6.0	6.4
Feb-15	0.043	0.091	45	43	11	9	95	14	11	94	29	9	6.0	6.4
Mar-15	0.036	0.06	46	39	10	9	96	13	11	93	51	22	6.0	6.4
Apr-15	0.034	0.053	47	45	14	9	95	29	16	91	87	27	6.0	6.6
May-15	0.025	0.032	46	37	13	11	96	18	15	92	142	24	5.9	6.5
Jun-15	0.023	0.033	44	44	17	13	95	17	13	95	210	43	6.2	6.6
Jul-15	0.024	0.032	46	37	16	12	96	25	16	93	140	30	6.2	6.6
Aug-15	0.025	0.035	54	44	16	13	95	22	16	93	122	46	6.2	6.6
Sep-15	0.029	0.042	51	44	27	16	94	11	10	95	125	14	6.0	6.6
Oct-15	0.029	0.062	54	49	12	10	96	10	9	96	97	26	6.1	6.5
Nov-15	0.05	0.108	41	40	10	8	94	9	8	94	183	26	6.0	6.5
Dec-15	0.063	0.128	55	58	11	10	92	13	10	91	215	20	6.0	6.4
Jan-16	0.057	0.145	58	48	15	12	92	29	16	86	26	7	5.9	6.6
Feb-16	0.055	0.124	73	78	10	8	95	14	11	94	82	18	6.0	6.4
Mar-16	0.062	0.133	67	72	15	8	94	19	12	92	137	16	5.9	6.4
Apr-16	0.025	0.035	46	40	9	7	97	10	9	96	5	2	6.0	7.5
May-16	0.022	0.031	43	37	13	10	96	9	8	96	73	9	6.0	6.5
Jun-16	0.022	0.031	44	39	14	10	96	15	10	96	179	52	6.2	6.5
Jul-16	0.024	0.033	52	48	14	13	95	13	11	96	275	120	6.3	6.6
Aug-16	0.023	0.032	51	47	13	12	96	13	11	96	114	9	6.2	6.5
Sep-16	0.024	0.041	44	37	11	11	96	11	10	95	42	23	6.1	6.5
Oct-16	0.053	0.128	58	46	16	12	94	12	11	93	142	19	6.0	6.5
Nov-16	0.061	0.127	— [(1)]	68	11	9	94	10	9	94	280	82	5.8	6.3
Dec-16	0.048	0.067	54	49	14	12	92	14	11	91	66	15	6.0	6.5

TABLE 5-3 (continued)

Summary of Discharge Monitoring Reports – Clallam Bay WWTP

	Flow (Effluent)		Influent		Effluent									
Date	Avg. Month Flow (mgd)	Peak Day Flow (mgd)	Avg. Month BOD (lb/day)	Avg. Month TSS (lb/day)	Weekly Avg. BOD (mg/L)	Monthly Average BOD (mg/L)	Monthly Average BOD Removal (%)	Weekly Avg. TSS (mg/L)	Monthly Average TSS (mg/L)	Monthly Average TSS Removal (%)	Weekly Average Fecal Coliform (#/100 mL)	Monthly Average Fecal Coliform (#/100 mL)	pH (Min. Month)	pH (Max. Month)
Jan-17	0.035	0.074	56	52	17	13	93	23	15	91	287	23	5.9	6.4
Feb-17	0.048	0.126	57	48	10	10	95	10	8	95	38	8	5.9	6.3
Mar-17	0.053	0.102	67	58	13	10	93	14	12	91	40	5	5.9	6.6
Apr-17	0.042	0.075	59	52	13	11	94	15	12	92	74	14	6.0	6.5
May-17	0.024	0.034	41	32	13	9	96	18	13	93	131	26	6.0	6.5
Jun-17	0.021	0.027	58	57	10	9	97	12	11	97	103	17	6.2	6.6
Jul-17	0.02	0.027	37	29	14	10	96	16	10	95	256	25	6.4	6.6
Aug-17	0.019	0.027	46	40	11	10	97	10	9	97	300	17	6.3	6.6
Sep-17	0.02	0.03	36	29	12	11	96	10	9	96	49	30	6.3	6.5
Oct-17	0.025	0.055	50	51	13	11	97	13	9	97	278	61	6.1	6.6
Nov-17	0.053	0.134	67	67	18	15	91	18	12	92	64	27	5.9	6.6
Dec-17	0.041	0.095	52	45	15	13	93	16	14	92	137	27	5.9	6.6
Maximum	**0.063**	**0.145**	**73**	**78**	**27**	**17**	**97**	**29**	**22**	**97**	**367**	**120**	**6.5**	**7.5**
Average	**0.034**	**0.063**	**50**	**44**	**14**	**12**	**94**	**16**	**13**	**93**	**130**	**27**	**6.1**	**6.6**
Minimum	**0.019**	**0.027**	**35**	**28**	**9**	**7**	**88**	**9**	**8**	**81**	**5**	**2**	**5.8**	**6.3**

(1) Outlier value rejected.

(2) Highlighted cells represent values outside of NPDES criteria.

TABLE 5-4

Summary of Discharge Monitoring Reports – Sekiu WWTP

Date	Flow (Effluent)		Influent		Effluent									
	Avg. Month Flow (mgd)	Peak Day Flow (mgd)	Avg. Month BOD (lb/day)	Avg. Month TSS (lb/day)	Weekly Avg. BOD (mg/L)	Monthly Average BOD (mg/L)	Monthly Average BOD Removal (%)	Weekly Avg. TSS (mg/L)	Monthly Average TSS (mg/L)	Monthly Average TSS Removal (%)	Weekly Average Fecal Coliform (#/100 mL)	Monthly Average Fecal Coliform (#/100 mL)	pH (Min. Month)	pH (Max. Month)
Jan-13	0.073	0.426	80	43	7	5	87	12	6	87	3	2	6.7	7.2
Feb-13	0.07	0.233	42	27	1	5	88	7	5	90	4	2	6.7	7.2
Mar-13	0.101	0.307	51	46	7	5	85	11	7	82	24	8	6.4	7.2
Apr-13	0.058	0.134	30	22	6	6	92	6	5	91	5	2	6.2	7.2
May-13	0.05	0.089	87	32	9	7	94	8	5	94	66	3	6.1	6.9
Jun-13	0.049	0.078	58	37	9	7	94	10	7	92	2	1	6.1	7.1
Jul-13	0.043	0.071	114	84	15	13	96	10	8	97	34	12	6.0	6.7
Aug-13	0.037	0.094	87	66	19	15	95	18	13	95	12	7	6.1	6.8
Sep-13	0.066	0.299	103	67	12	11	95	12	8	96	160	19	6.0	7.0
Oct-13	0.052	0.124	44	35	6	6	95	9	5	96	14	2	6.2	6.9
Nov-13	0.068	0.199	30	29	7	5	91	4	3	95	24	3	6.9	7.3
Dec-13	0.052	0.088	26	46	5	4	91	5	4	96	66	5	6.7	7.4
Jan-14	0.076	0.354	30	20	6	5	92	4	4	92	106	8	6.7	7.3
Feb-14	0.106	0.259	45	26	7	5	83	8	5	81	204	19	7.0	7.4
Mar-14	0.108	0.3	52	27	5	4	90	4	3	89	10	5	6.9	7.2
Apr-14	0.066	0.114	41	19	5	4	94	3	2	95	12	4	6.8	7.1
May-14	0.052	0.127	35	20	7	5	94	5	4	94	76	4	5.8	7.1
Jun-14	0.027	0.048	80	45	8	6	98	8	6	97	5	3	6.1	6.7
Jul-14	0.036	0.057	88	75	22	15	95	19	10	96	53	9	6.0	6.7
Aug-14	0.029	0.043	108	55	18	14	96	14	8	97	148	50	6.4	6.6
Sep-14	0.035	0.079	162	120	15	12	97	16	9	98	85	17	6.2	6.9
Oct-14	0.087	0.253	87	41	12	8	92	43	13	84	147	7	6.3	7.0
Nov-14	0.099	0.274	46	23	5	5	89	5	4	89	19	5	6.7	7.3
Dec-14	0.116	0.519	38	24	5	5	86	6	4	87	84	6	5.8	7.2

TABLE 5-4 (continued)

Summary of Discharge Monitoring Reports – Sekiu WWTP

	Flow (Effluent)		Influent		Effluent									
Date	Avg. Month Flow (mgd)	Peak Day Flow (mgd)	Avg. Month BOD (lb/day)	Avg. Month TSS (lb/day)	Weekly Avg. BOD (mg/L)	Monthly Average BOD (mg/L)	Monthly Average BOD Removal (%)	Weekly Avg. TSS (mg/L)	Monthly Average TSS (mg/L)	Monthly Average TSS Removal (%)	Weekly Average Fecal Coliform (#/100 mL)	Monthly Average Fecal Coliform (#/100 mL)	pH (Min. Month)	pH (Max. Month)
Jan-15	0.099	0.35	18	8	5	4	86	3	2	87	28	10	6.7	7.2
Feb-15	0.088	0.377	36	22	5	4	94	4	3	95	2	1	6.4	7.0
Mar-15	0.085	0.205	24	18	5	4	92	4	3	93	256	8	6.4	7.4
Apr-15	0.055	0.094	36	25	5	4	94	0	4	94	7	2	6.3	7.1
May-15	0.035	0.057	37	25	18	10	93	21	8	93	14	2	5.9	6.6
Jun-15	0.02	0.036	41	30	20	12	94	10	10	95	12	2	6.2	6.7
Jul-15	0.031	0.048	154	81	25	17	95	20	14	96	254	39	6.2	6.6
Aug-15	0.03	0.053	85	65	18	16	96	15	12	96	8	6	6.3	6.5
Sep-15	0.055	0.088	101	69	17	14	93	9	7	96	40	27	6.1	6.6
Oct-15	0.059	0.276	79	52	12	9	95	10	8	96	4	2	6.4	6.8
Nov-15	0.127	0.445	62	41	6	5	84	6	5	85	140	14	6.5	7.2
Dec-15	0.156	0.443	45	31	8	5	85	8	5	83	260	5	6.9	7.2
Jan-16	0.126	0.462	56	40	8	5	87	5	4	91	66	11	6.6	7.1
Feb-16	0.111	0.438	31	23	4	4	88	7	5	86	17	3	6.8	7.1
Mar-16	0.137	0.388	23	39	6	4	87	10	4	88	60	15	6.5	7.2
Apr-16	0.038	0.051	37	30	5	4	96	4	3	97	3	1	6.1	7.0
May-16	0.025	0.042	38	29	21	11	94	25	13	93	4	2	6.1	6.7
Jun-16	0.021	0.039	56	35	15	11	95	21	10	96	7	3	6.1	6.7
Jul-16	0.027	0.043	59	48	17	16	94	20	17	94	27	3	6.2	6.8
Aug-16	0.019	0.03	59	35	17	13	96	11	7	97	5	3	6.4	6.8
Sep-16	0.031	0.065	42	30	12	9	94	5	5	97	73	8	6.4	6.7
Oct-16	0.134	0.413	—[1]	44	8	7	92	8	5	94	64	10	6.6	7.1
Nov-16	0.134	0.343	42	28	5	5	85	5	4	87	24	6	6.6	7.1
Dec-16	0.092	0.229	20	15	4	4	79	4	3	82	47	8	6.8	7.1

TABLE 5-4 (continued)

Summary of Discharge Monitoring Reports – Sekiu WWTP

	Flow (Effluent)		Influent		Effluent									
Date	Avg. Month Flow (mgd)	Peak Day Flow (mgd)	Avg. Month BOD (lb/day)	Avg. Month TSS (lb/day)	Weekly Avg. BOD (mg/L)	Monthly Average BOD (mg/L)	Monthly Average BOD Removal (%)	Weekly Avg. TSS (mg/L)	Monthly Average TSS (mg/L)	Monthly Average TSS Removal (%)	Weekly Average Fecal Coliform (#/100 mL)	Monthly Average Fecal Coliform (#/100 mL)	pH (Min. Month)	pH (Max. Month)
Jan-17	0.06	0.291	123	43	7	5	91	12	6	88	10	3	6.5	7.0
Feb-17	0.093	0.41	42	31	4	4	95	5	3	96	15	4	6.5	7.0
Mar-17	0.129	0.354	64	35	6	5	87	5	3	91	186	45	6.4	7.0
Apr-17	0.083	0.234	48	31	5	4	93	7	4	93	7	4	6.5	6.9
May-17	0.042	0.073	65	30	6	5	97	5	4	97	178	5	6.0	6.6
Jun-17	0.029	0.06	46	27	6	5	98	4	3	98	4	2	6.2	6.7
Jul-17	0.027	0.047	119	51	22	14	96	13	9	97	12	3	6.0	6.7
Aug-17	0.023	0.041	78	46	24	21	94	11	8	97	50	21	6.4	6.8
Sep-17	0.019	0.03	52	32	14	11	96	5	4	98	20	4	6.3	6.7
Oct-17	0.055	0.255	104	41	14	8	94	13	1	95	274	8	6.3	6.9
Nov-17	0.133	0.426	86	56	6	5	91	30	10	80	8	3	6.6	7.2
Dec-17	0.061	0.266	23	12	4	4	87	4	3	89	40	6	7.0	7.3
Maximum	**0.156**	**0.519**	**162**	**120**	**25**	**21**	**98**	**43**	**17**	**98**	**274**	**50**	**7.0**	**7.4**
Average	**0.067**	**0.201**	**61**	**39**	**10**	**8**	**92**	**10**	**6**	**92**	**60**	**8**	**6.4**	**7.0**
Minimum	**0.019**	**0.03**	**18**	**8**	**1**	**4**	**79**	**0**	**1**	**80**	**2**	**1**	**5.8**	**6.5**

(1) Outlier value rejected.

(2) Highlighted cells represent values outside of NPDES criteria.

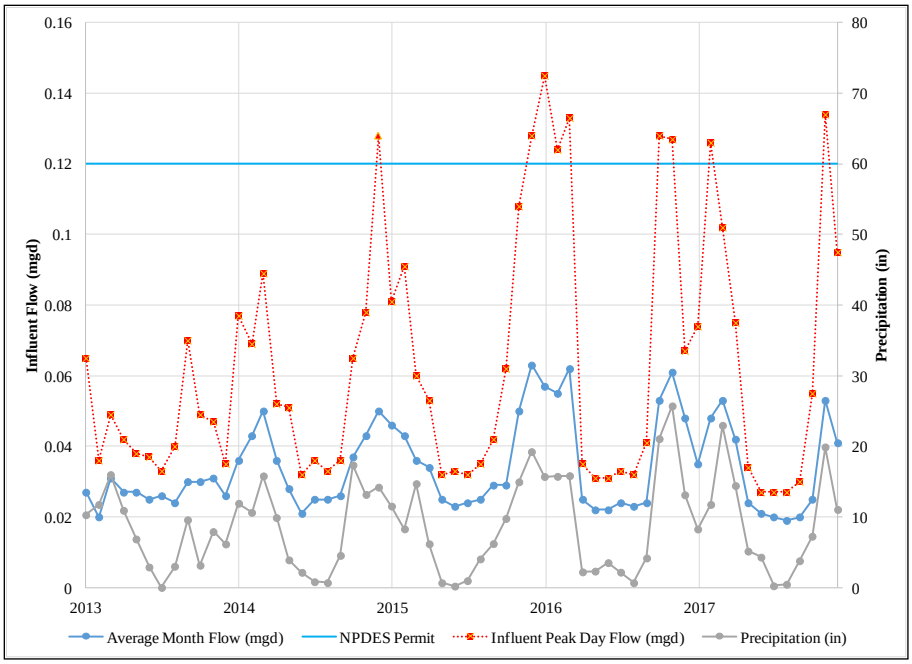


FIGURE 5-1

Clallam Bay WWTP Flows 2013 Through 2017

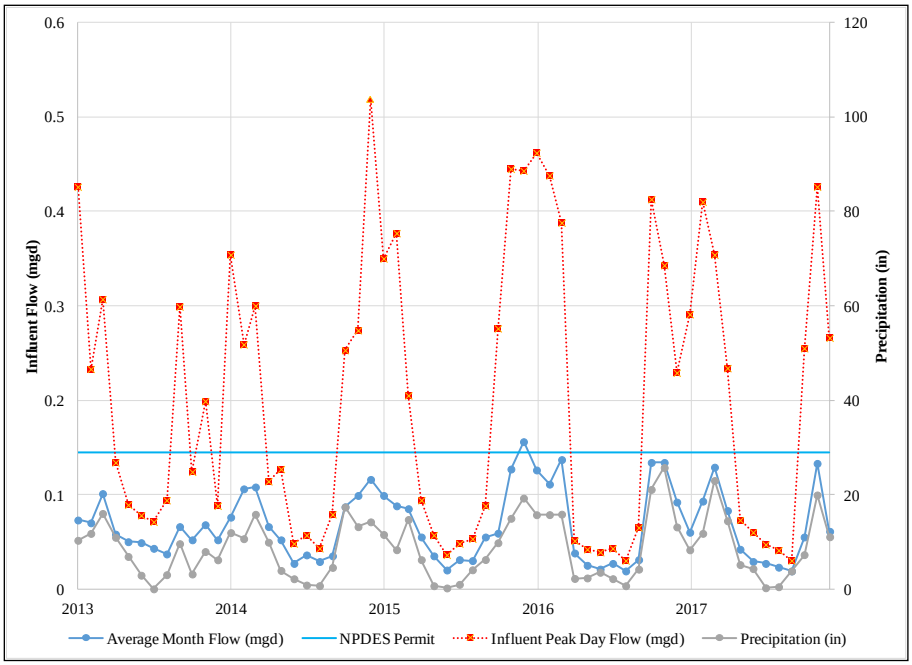


FIGURE 5-2

Sekiu WWTP Flows 2013 Through 2017

HISTORICAL INFLUENT LOADING AT WWTP

The annual average and maximum month BOD_5 and TSS mass loading for 2013 through 2017 are listed in Tables 5-5 and 5-6.

TABLE 5-5

Clallam Bay WWTP Influent Loading for 2013 Through 2017

Year	Annual Average BOD_5 (lb/day)	Annual Average TSS (lb/day)	Maximum Month BOD_5 (lb/day)	Maximum Month TSS (lb/day)	NPDES Monthly Permit Limit BOD_5 (lb/day)	NPDES Monthly Permit Limit TSS (lb/day)
2013	46	39	58	46	135	171
2014	51	43	65	56	135	171
2015	48	43	55	58	135	171
2016	50	51	73	78	135	171
2017	52	47	67	67	135	171
Average	**49**	**44**	**64**	**61**	**135**	**171**

TABLE 5-6

Sekiu WWTP Influent Loading for 2013 Through 2017

Year	Annual Average BOD_5 (lb/day)	Annual Average TSS (lb/day)	Maximum Month BOD_5 (lb/day)	Maximum Month TSS (lb/day)	NPDES Monthly Permit Limit BOD_5 (lb/day)	NPDES Monthly Permit Limit TSS (lb/day)
2013	63	45	114	84	135	171
2014	68	41	162	120	135	171
2015	60	39	154	81	135	171
2016	39	33	59	48	135	171
2017	71	36	123	56	135	171
Average	**61**	**39**	**122**	**78**	**135**	**171**

(1) Highlighted cells reflect exceedances of NPDES criteria.

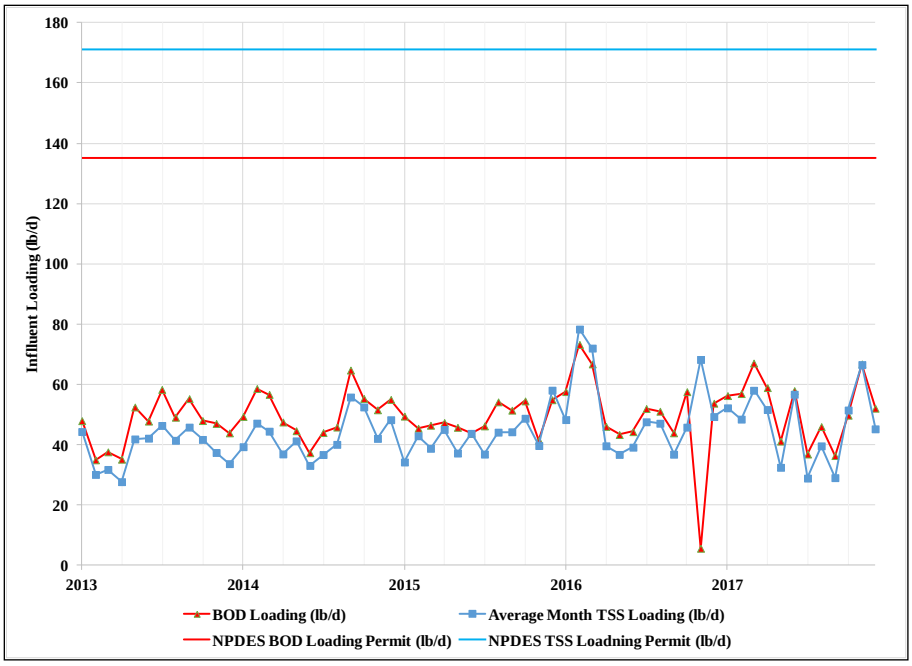


FIGURE 5-3

Clallam Bay WWTP Influent BOD and TSS Loadings for 2013 Through 2017

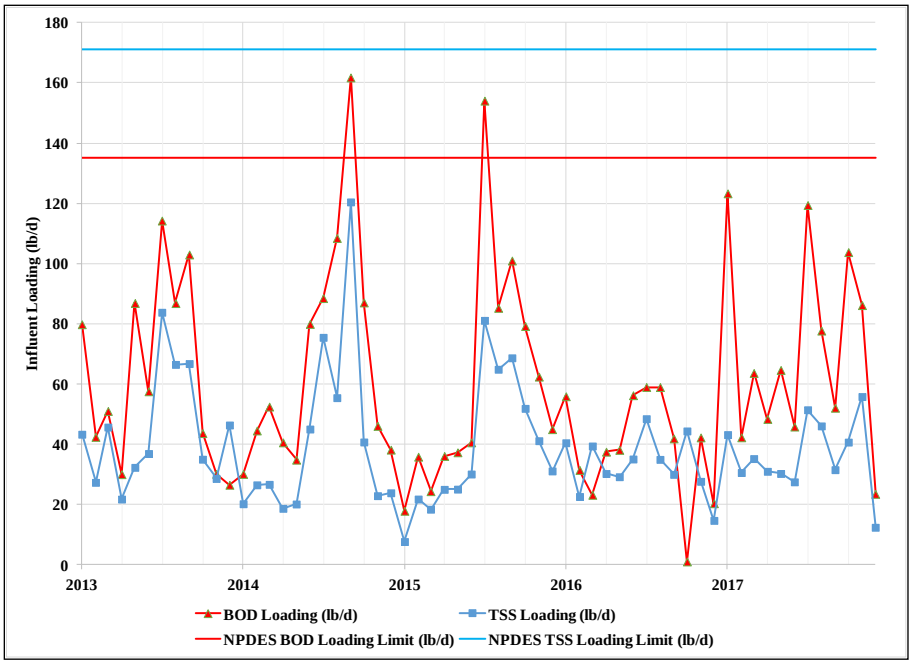


FIGURE 5-4

Sekiu WWTP Influent BOD and TSS Loadings for 2013 Through 2017

As shown on Figure 5-3, influent BOD_5 and TSS loadings to the Clallam Bay WWTP did not exceed the maximum permitted values in the NPDES permit during the period from 2013 to 2017. As shown on Figure 5-4, the influent BOD_5 loading to the Sekiu WWTP did exceed the maximum permitted values twice during that period, but the TSS has not exceeded its influent loading limit.

Tables 5-7 and 5-8 show monthly average WWTP flows and influent loadings. As shown, influent loadings to the Clallam Bay WWTP are relatively constant while influent loadings to the Sekiu WWTP peak significantly in the summer.

TABLE 5-7

Clallam Bay WWTP Influent BOD and TSS Loadings for 2013 Through 2017 – Monthly Averages

Month	Average WWTP Flow (mgd)	Average Influent BOD_5 Loading (lb/day)	Average Influent TSS Loading (lb/day)
January	0.0402	52	44
February	0.0418	54	49
March	0.0464	55	49
April	0.0328	47	40
May	0.0252	45	38
June	0.0224	46	43
July	0.0238	47	39
August	0.0232	49	42
September	0.0258	50	42
October	0.0348	53	48
November	0.0476	42	51
December	0.0456	52	47

TABLE 5-8

Sekiu WWTP Influent BOD and TSS Loadings for 2013 Through 2017 – Monthly Averages

Month	Average WWTP Flow (mgd)	Average BOD_5 Influent Loading (lb/day)	Average TSS Influent Loading (lb/day)
January	0.0868	61	31
February	0.0936	39	26
March	0.112	43	33
April	0.060	38	25
May	0.0408	52	27
June	0.0292	56	35
July	0.0328	107	68
August	0.0276	83	54
September	0.0412	92	63
October	0.0774	63	43
November	0.1122	53	35
December	0.0954	31	26

INFILTRATION AND INFLOW

Influent flow rates at the WWTPs (as recorded in the daily monitoring reports) and precipitation data are presented on Figures 5-1 and 5-2. As previously noted, the WWTPs do not measure influent flows but measure effluent flow. Effluent flow is assumed to be equal to influent for the purposes of this evaluation. The flow measured at the WWTP consists of an I/I component in addition to residential, public use, and commercial components.

The average base sanitary flow is the flow at the WWTP excluding I/I, but including residential, industrial, public use, and commercial components. Typically, in western Washington, WWTP flows are higher in the winter months than in the summer months due to a larger I/I component in the winter. This trend of higher flows in the winter months assumes the base sanitary flow remains relatively constant throughout the winter and summer months. However, since the population in the Clallam Bay/Sekiu area increases significantly in summer, especially during peak fishing season, the typical trend of relatively constant base sanitary sewer flow does not occur in Clallam Bay and Sekiu. The WWTP flow is high in the winter months due to the high I/I component, which is typical for western Washington; however, the WWTP flow loading can also be high in the summer months as a result of a large seasonal population.

The precipitation information presented in Table 5-9 and monthly WWTP influent flows (Tables 5-3 and 5-4) for the two WWTPs during the non-tourist season (from September

through June) were reviewed to attempt to determine the base sanitary sewer flow for the two communities. The precipitation is lowest during this period in the months of May and June. The months of June 2014, May 2015, June 2015, and May 2016 had especially low precipitation; consequently, flows from these months are considered representative of the base sanitary flow.

TABLE 5-9

Monthly Average Precipitation from 2013 Through 2017

Month	Precipitation (inches)				
	2013	**2014**	**2015**	**2016**	**2017**
January	10	12	12	16	8
February	12	11	8	16	12
March	16	16	15	16	23
April	11	10	6	2	14
May	7	4	1	2	5
June	3	2	0	4	4
July	0	1	1	2	0
August	3	1	4	1	0
September	10	5	6	4	4
October	3	17	10	21	7
November	8	13	15	26	20
December	6	14	19	13	11

(1) Low precipitation months considered representative of base flow are highlighted.

Infiltration and inflow for Clallam Bay and Sekiu were estimated based on precipitation and WWTP flow meter readings at the WWTPs for 2013 through 2017. I/I rates are presented in Tables 5-10 and 5-11. Average flows observed during the period of May and June when precipitation was low were considered representative of average base sanitary flow (i.e., flows without a large I/I component). The following assumptions were made:

1. The seasonal population increase has not significantly picked up and the sewer users during the months of May and June are reasonably representative of a year-round population.

2. Base flow (the portion of sewage that is not I/I) does not significantly change from the months of May and June through the winter.

3. I/I is the difference between the low-precipitation May and June flows and metered flow during the winter months at the WWTPs.

To obtain the average, maximum month, peak day, and peak hour infiltration and inflow presented in Table 5-10, the average base sanitary flow was subtracted from the average, maximum month, and peak day flows.

TABLE 5-10

Clallam Bay WWTP Infiltration and Inflow Summary for 2013 Through 2017

Flow Type	WWTP Flow (mgd)	Base Flow (mgd)	I/I (mgd)	Service Area (acre)	I/I (gpad)
Annual Average	0.034	0.024	0.010	145	72
Maximum Month	0.063	0.024	0.039	145	271
Peak Day	0.145	0.024	0.121	145	836
Peak Hour	0.388	0.038	0.35	145	2,414

TABLE 5-11

Sekiu WWTP Infiltration and Inflow Summary for 2013 Through 2017

Flow Type	WWTP Flow (mgd)	Base Flow (mgd)	I/I (mgd)	Service Area (acre)	I/I (gpad)
Annual Average	0.067	0.023	0.045	183	245
Maximum Month	0.156	0.023	0.134	183	730
Peak Day	0.519	0.023	0.497	183	2,713
Peak Hour	1.4	0.030	1.37	183	7,486

As can be seen in Tables 5-10 and 5-11, Sekiu has much higher I/I than Clallam Bay, both on an absolute basis and on an areal basis (gpad).

INFILTRATION AND INFLOW ANALYSIS USING EPA CRITERIA

An additional analysis of infiltration and inflow was performed to compare estimates of per capita I/I to EPA criteria. These infiltration and inflow rates are summarized in Table 5-12.

The U.S. EPA manual entitled *I/I Analysis and Project Certification* provides recommended guidelines for determining if infiltration and/or inflow are excessive.

1. To determine if excessive ***infiltration*** is occurring, a threshold value of 120 gpcd is used. This infiltration value is based on an average daily flow over a 7- to 14-day non-rainfall period during seasonal high groundwater conditions.

2. To determine if excessive ***inflow*** is present in a collection system, the U.S. EPA uses a threshold value of 275 gpcd. If the average daily flow (excluding major commercial and industrial flows greater than 50,000 gpd each) during periods of significant rainfall exceeds 275 gpcd, the amount of inflow is considered excessive.

Infiltration

Clallam Bay

Analysis of precipitation records from the Quillayute Airport show a 10-day period, December 5 to 15, 2017, when virtually no rainfall (0.05 inch total) was reported. This is also a period of relatively high groundwater due to a total rainfall of over 20 inches in the previous 3 weeks. The average daily flow recorded during this time period is 33,200 gpd. (The highest daily flow was 44,100 gpd.) With an estimated total winter population of sewer users in 2017 of 310 and an average daily flow of 33,200 gpd, the infiltration rate based on EPA criteria is estimated to be 107 gpcd. The calculation is as follows: 33,200 gal/310 people = 107 gpcd. Because this value is less than the EPA guideline of 120 gpcd, Clallam Bay is not considered to have excessive infiltration by EPA criteria.

Sekiu

For the same period (December 5 to 15, 2017) in Sekiu, the average daily flow recorded was 28,300 gpd. (The highest daily flow was 49,500 gpd.) With an estimated total winter population of sewer users in 2017 of 212 and an average daily flow of 28,300 gpd, the peak infiltration is estimated to be 134 gpcd. The calculation is as follows: 28,300 gal/212 people = 134 gpcd. Because this value is higher than the EPA guideline of 120 gpcd, Sekiu is considered to have excessive infiltration by EPA criteria. However, inflow would appear to be a much more significant problem than infiltration, as described below.

Inflow

Clallam Bay

The maximum day flow at the WWTP over the period of 2013 to 2017 was 145,000 gpd (recorded in January 2016). With an estimated total winter population of sewer users of 310 and a flow of 145,000 gpd for this day, the peak influent flow is estimated at 468 gpcd. The calculation is as follows: 145,000 gal/310 people = 468 gpcd. Because this value is greater than the EPA guideline of 275 gpcd, Clallam Bay is considered to have excessive inflow by EPA criteria.

Sekiu

The maximum day flow at the WWTP over the period of 2013 to 2017 was 519,000 gpd (recorded in December 2014). With an estimated total winter population of sewer users of 212 and a flow of 519,000 gpd for this day, the peak influent flow is estimated at 2,448 gpcd. The calculation is as follows: 519,000 gal/212 people = 2,448 gpcd. Because this value is greater than the EPA guideline of 275 gpcd, Sekiu is considered to have excessive inflow by EPA criteria.

TABLE 5-12

Per Capita Infiltration and Inflow Based on EPA Criteria

Parameter	EPA Criteria for Excessive I/I (gpcd)	Estimated Clallam Bay I/I Value (gpcd)	Estimated Sekiu I/I Value (gpcd)
EPA Excessive Infiltration Criteria	120	107	134 (1)
EPA Excessive Inflow Criteria	275	468 (1)	2,448 (1)

(1) Exceeds EPA criteria.

EXISTING EQUIVALENT RESIDENTIAL UNITS

Table 5-13 provides estimates of ERUs and sewer service population based on information provided by the County. As shown, Sekiu has a larger population of transient summer-only residents.

TABLE 5-13

Current Wastewater ERU Estimates

	Year-Round Residential ERUs	Year-Round Non-Residential ERUs	Total Year-Round ERUs	Transient ERUs (Summer only)	Total ERUs in Summer	Total Year-Round (Winter) Population (1)
Sekiu	108	35	143	190	333	216
Clallam Bay	183	59	242	0	242	366
Total	**291**	**94**	**385**	**190**	**575**	**582**

(1) Based on 2.0 people per household per OFM population and housing estimates.

The use of ERUs allows the expression of the amount of water or sewer use by non-residential customers as an equivalent number of residential customers. The ***water consumption*** ERU value is calculated by dividing the total volume of water utilized in the single-family residential (SFR) customer class by the total number of active single-family residential connections. The ***wastewater*** ERU value is typically calculated

based on either of two methods: (1) single-family winter water use, or (2) dry weather wastewater flow.

Single-family winter water use is often used because winter water use for irrigation is low and the majority of the water consumed during the winter will enter the sewer and will ultimately end up at the treatment plant. During the drier months, a significant fraction of the water consumed will be for irrigation purposes and will not enter the wastewater collection system. Based on previous experience at similarly sized wastewater treatment plants, typically 85 to 95 percent of the winter water consumed will enter the wastewater collection system.

For Clallam Bay and Sekiu, dry weather wastewater flow was used to estimate the base flow (summarized in Tables 5-10 and 5-11) and the ERU value discussed below. As noted previously, for the non-tourist season from September through June, the precipitation is lowest in the months of May and June. Consequently, WWTP flows from May and June are considered representative of the base sanitary flow. Furthermore, the months of May and June are not typically months with a high seasonal population.

For Clallam Bay, the wastewater ERU value (98 gpd/ERU) was estimated by dividing the number of year-round ERUs (242) into the base flow (24,000 gpd). Similarly, for Sekiu, the wastewater ERU value (158 gpd/ERU) was estimated by dividing the number of year-round ERUs (143) into the base flow (23,000 gpd). Compared to other communities, the wastewater ERU value for Clallam Bay is slightly lower, and for Sekiu, it is right within, the average range of 125 to 145 gpd. This may be due to the difficulty in estimating the actual number of connections, due to the apparent large number of unbilled, and in some cases unknown connections, particularly in Sekiu.

PROJECTED WASTEWATER PRODUCTION AND LOADINGS

Tables 5-14 and 5-15 show current and projected future ERUs and flows for Clallam Bay and Sekiu, respectively. A 1 percent annual growth rate was used to project future ERUs. The wastewater ERU values of 98 and 158 gpd/ERU for Clallam Bay and Sekiu, respectively, were multiplied by the projected number of ERUs to estimate future base flows. It is assumed that the increase in transient summer-only population also exhibits a 1 percent annual growth rate.

To estimate future annual average, maximum month, and peak day flows, the I/I flow rates were added to the base level wastewater flows per ERU as discussed in the previous section to obtain the respective future WWTP influent flow rates. The estimated number of winter ERUs was used because flows peak in the winter due to I/I and the increased number of ERUs in the summer does not exceed the flow due to I/I. The flow rates developed in Tables 5-14 and 5-15 are based on the assumption that the absolute I/I rates remain constant through 2038 (i.e., it was assumed that future increases in I/I due to sewer system deterioration are equal to the amount of I/I removed due to I/I removal projects). This can be either a conservative or non-conservative assumption depending

on the condition of the system and the willingness of and funding available for the community to take measures to reduce I/I.

TABLE 5-14

Current and Projected Future Wastewater ERUs and Flows for Clallam Bay

Category	Unit	2018	2028	2038
Projected ERUs by Customer Type				
Residential, Year-Round	ERUs	183	202	224
Non-Residential	ERUs	59	65	72
Transient (Summer Only)	ERUs	0	0	0
Total, Summer	ERUs	242	267	295
Total, Winter	ERUs	242	267	295
Projected Flows				
Total Average Base Flow	mgd	0.024	0.026	0.029
Average Annual Flow	mgd	0.034	0.037	0.039
Maximum Month	mgd	0.063	0.065	0.068
Peak Day	mgd	0.145	0.147	0.150
Peak Hour	mgd	0.388	0.422	0.444

TABLE 5-15

Current and Projected Future Wastewater ERUs and Flows for Sekiu

Category	Unit	2018	2028	2038
Projected ERUs by Customer Type				
Residential, Year-Round	ERUs	108	119	132
Non-Residential	ERUs	35	38	42
Transient (Summer Only)	ERUs	190	207	225
Total, Summer	ERUs	333	365	400
Total, Winter	ERUs	143	158	174
Projected Flows				
Total Average Base Flow	mgd	0.023	0.025	0.028
Average Annual Flow	mgd	0.067	0.070	0.072
Maximum Month	mgd	0.156	0.158	0.161
Peak Day	mgd	0.519	0.521	0.524
Peak Hour	mgd	1.400	1.460	1.500

BOD_5 LOADING

Clallam Bay

Monthly average influent BOD_5 loadings at the Clallam Bay WWTP ranged from 35 to 73 lb/day for the 5-year period of analysis as shown in Tables 5-3 and 5-5. The average BOD_5 loading for the 5 years, as summarized in Table 5-5, was 50 lb/day. The monthly average influent BOD_5 rated loading of 135 lb/day was never exceeded during the 5-year period of analysis. The average influent BOD_5 concentration for the 5-year period is 220 mg/L, which would be considered medium-strength domestic wastewater. As shown in Table 5-7, BOD_5 loading is relatively constant throughout the year, with a slight decrease during tourist season (in marked contrast to Sekiu, discussed below).

With a service population of 366 and an annual average BOD_5 loading of 50 lb/day, the annual average BOD_5 loading was 0.137 pounds per capita per day (lb/cap/day). This value is below the Department of Ecology *Criteria for Sewage Works Design* estimate of 0.2 lb/cap/day.

To convert the maximum month BOD_5 loading to a per capita and an ERU basis, the service population, 366, the number of ERUs in the summer, 242, and maximum month BOD_5 of 73 lb/day were used to calculate a maximum month per capita and per ERU BOD_5 loading of 0.200 lb/cap/day and 0.303 lb/ERU/day, respectively. The ratio of the maximum month BOD_5 loading, 73 lb/day, to the annual average BOD_5 loading, 50 lb/day, is 1.46. This ratio is used in the development of future loadings to the WWTP later in the chapter.

Sekiu

The monthly average influent BOD_5 loadings at the Sekiu WWTP ranged from 18 to 162 lb/day for the 5-year period of analysis as shown in Tables 5-4 and 5-6. The average BOD_5 loading for the 5 years, as summarized in Table 5-6, was 61 lb/day. The monthly average influent BOD_5 rated loading of 135 lb/day was exceeded twice during the 5-year period of analysis in September 2015 and July 2015. The average influent BOD_5 concentration for the 5-year period is 142 mg/L, which would be considered low-strength domestic wastewater, reflecting the impact of I/I diluting the annual average concentration. As shown in Table 5-6, BOD_5 loading peaks significantly in the summer tourist season, unlike Clallam Bay.

With a year-round service population of 216 and an annual average BOD_5 loading of 61 lb/day, the annual average BOD_5 loading was 0.282 lb/cap/day. This value is well above the Department of Ecology *Criteria for Sewage Works Design* estimate of 0.2 lb/cap/day and reflects the impact of seasonal, transient residents on the loading.

To convert the maximum month BOD_5 loading to a per capita and an ERU basis, the service population, 216, number of summer ERUs, 333, and maximum month BOD_5 of

162 lb/day were used to calculate a maximum month per capita and per ERU BOD_5 loading of 0.749 lb/cap/day and 0.486 lb/ERU/day, respectively. The ratio of the maximum month BOD_5 loading, 162 lb/day, to the annual average BOD_5 loading, 61 lb/day, is 2.65. This ratio is used in the development of future loadings to the WWTP later in the chapter.

TOTAL SUSPENDED SOLIDS LOADING

Clallam Bay

The monthly average influent TSS loadings at the Clallam Bay WWTP ranged from 28 to 78 lb/day for the 5-year period of analysis as shown in Tables 5-3 and 5-5. The average TSS loading for the 5 years, as summarized in Table 5-5, was 44 lb/day. The monthly average influent TSS rated loading of 171 lb/day was never exceeded during the 5-year period of analysis. The average influent TSS concentration for the 5-year period is 192 mg/L, which would be considered within the lower range of medium-strength domestic wastewater. As shown in Table 5-7, similar to the BOD_5 loading, the TSS loading is relatively constant throughout the year, with a slight decrease during tourist season (in marked contrast to Sekiu, discussed below).

With a service population of 366, and an annual average TSS loading of 44 lb/day, the annual average TSS loading was 0.143 lb/cap/day.

To convert the maximum month TSS loading to a per capita and an ERU basis, the service population, 366, number of ERUs, 242, and maximum month TSS of 78 lb/day were used to calculate a maximum month per capita and per ERU TSS loading of 0.214 lb/cap/day and 0.324 lb/ERU/day, respectively. The ratio of the maximum month TSS loading, 78 lb/day, to the annual average TSS loading, 44 lb/day, is 1.76. This ratio is used in the development of future loadings to the WWTP later in the chapter.

Sekiu

Monthly average influent TSS loadings at the Sekiu WWTP ranged from 8 to 120 lb/day for the 5-year period of analysis as shown in Tables 5-4 and 5-6. The average TSS loading for the 5 years, as summarized in Table 5-6, was 39 lb/day. The monthly average influent TSS rated loading of 171 lb/day was never exceeded during the 5-year period of analysis. The average influent TSS concentration for the 5-year period is 126 mg/L, which would be considered low-strength domestic wastewater, reflecting the impact of I/I diluting the annual average concentration. As shown in Table 5-8, TSS loading, similar to BOD_5, peaks significantly in the summer tourist season, unlike Clallam Bay.

With a year-round service population of 216, and an annual average TSS loading of 39 lb/day, the annual average TSS loading was 0.180 lb/cap/day.

To convert the maximum month TSS loading to a per capita and an ERU basis, the service population, 216, number of summer ERUs, 333, and maximum month TSS of 120 lb/day were used to calculate a maximum month per capita and per ERU TSS loading of 0.558 lb/cap/day and 0.362 lb/ERU/day, respectively. The ratio of the maximum month TSS loading, 120 lb/day, to the annual average TSS loading, 39 lb/day, is 3.10. This ratio is used in the development of future loadings to the WWTP later in the chapter.

PROJECTED FUTURE WASTEWATER LOADINGS

Future WWTP maximum month BOD_5 and TSS are estimated by multiplying the projected number of ERUs by the respective ERU-based loadings. Future ERU-based annual average BOD_5 and TSS loadings are estimated using the ratio of the maximum month to annual average loadings of these parameters. Tables 5-16 and 5-17 provide a summary of projected future WWTP influent BOD_5 and TSS loadings. The number of summer ERUs were used to project BOD_5 and TSS since these parameters increase in proportion to the number of ERUs.

The current maximum month BOD_5 and TSS loadings at the Clallam Bay WWTP are 0.303 lb BOD_5/ERU/day and 0.324 lb TSS/ERU/day, respectively. The ratio of the maximum month to annual average BOD_5 is 1.46:1. The ratio of the maximum month to annual average TSS is 1.76:1.

TABLE 5-16

Current and Projected WWTP Influent Loadings – Clallam Bay

ERUs and Loadings	2018	2028	2038	NPDES Permit Limit
Total Summer ERUs	242	267	295	—
Annual Average BOD_5 (lb/day)	50	55	61	—
Maximum Month BOD_5 (lb/day)	73	81	89	135
Annual Average TSS (lb/day)	44	49	54	—
Maximum Month TSS (lb/day)	78	87	96	171

The current maximum month BOD_5 and TSS loadings at the Sekiu WWTP are 0.486 lb BOD_5/ERU/day and 0.362 lb TSS/ERU/day, respectively. The ratio of the maximum month to annual average BOD_5 is 2.65:1. The ratio of the maximum month to annual average TSS is 3.10:1.

TABLE 5-17

Current and Projected WWTP Influent Loadings – Sekiu

ERUs and Loadings	2018	2028	2038	NPDES Permit Limit
Total Summer ERUs	333	365	400	—
Annual Average BOD_5 (lb/day)	61	67	74	—
Maximum Month BOD_5 (lb/day)	162 (1)	179 (1)	197 (1)	135
Annual Average TSS (lb/day)	39	43	47	—
Maximum Month TSS (lb/day)	120	133	147	171

(1) Exceeds NPDES permit criteria.

As shown in Tables 5-16 and 5-17, the projected 20-year maximum month loadings for BOD_5 and TSS do not exceed the maximum month design limit for Clallam Bay. However, the projected 20-year maximum month loading for BOD_5 does exceed the maximum month design limit for Sekiu, while the projected TSS loading is below the limit.

CHAPTER 6

COLLECTION SYSTEM EVALUATION

INTRODUCTION

This chapter presents the results of the Sekiu/Clallam Bay collection system evaluation. The evaluation includes flow monitoring, smoke testing, manhole inspections, review of videoed sewer mains and review of pump station and wastewater treatment plant (WWTP) data as a means to identify areas of excessive inflow and infiltration (I/I). The I/I related analysis is described in detail within the September 2018 *Clallam Bay/Sekiu Infiltration and Inflow Study* provided in Appendix E.

In addition, a hydraulic analysis was performed to evaluate the capacity of the collection systems under existing and future conditions using population, land use, and wastewater flow characteristics presented in Chapters 3 and 5 of this Plan. Total land use area and wastewater flows are allocated to individual subareas, or basins, to identify current and future deficiencies in the collection system.

I/I ANALYSIS

Due to significant amounts of I/I seen at the wastewater treatment plants, an I/I analysis was performed (see Appendix E). The following is a summary of what is presented within the I/I Study.

FLOW MONITORING

To obtain further understanding of where I/I may occur within the sewer systems, flow monitors were installed in nine manholes for approximately 3 weeks each from April 6, 2018 to June 5, 2018. These meters were installed throughout both the Sekiu and Clallam Bay systems as shown in Figure 6-1. Flow monitoring was performed using three Hach FL900 Series Flow Loggers and FLO-DAR AV Sensors.

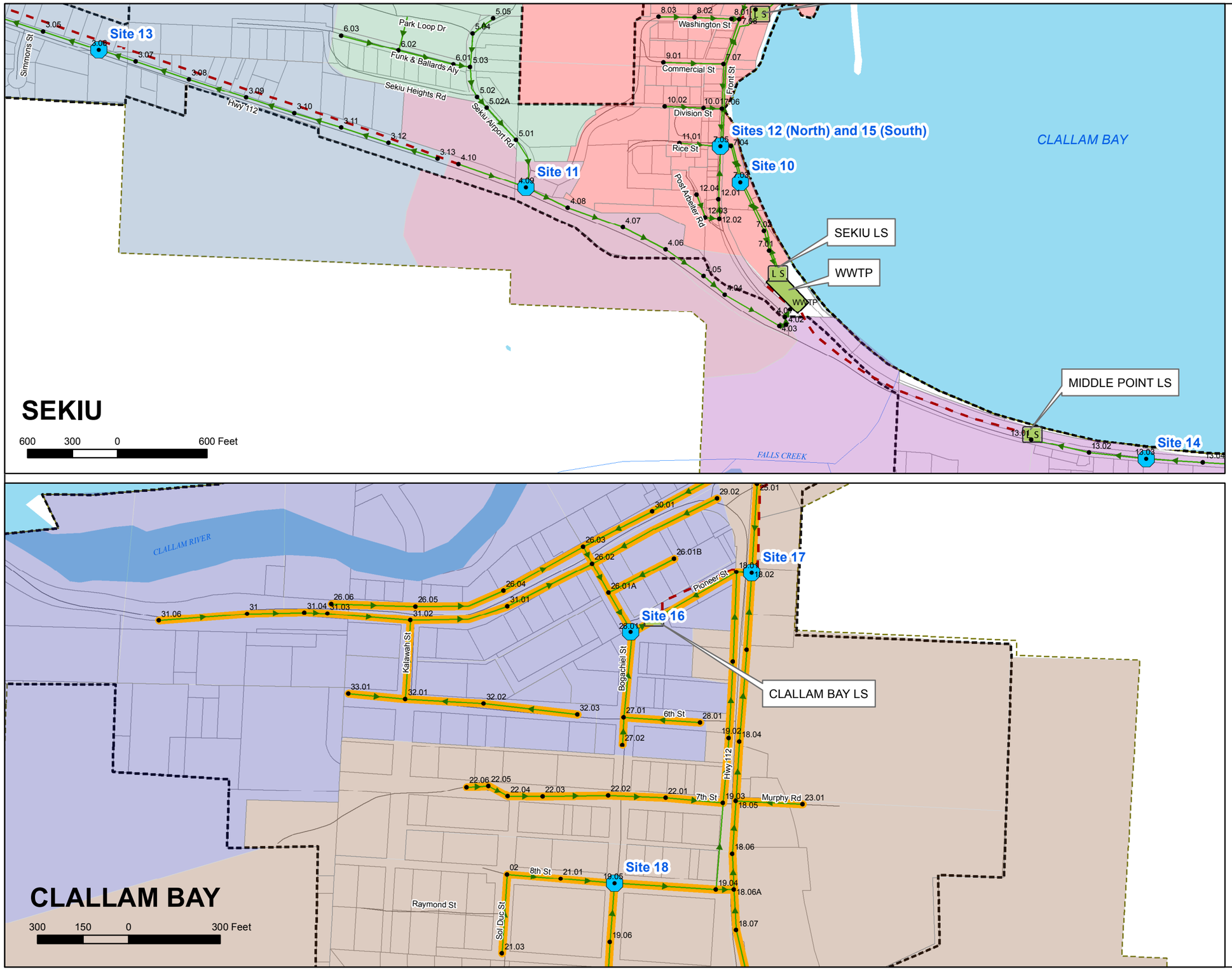
As a pre-cursor to determining the location of the flow meters, an analysis of the lift station runtime data was performed to obtain a better understanding of which basins experience higher I/I rates. Both dry and wet weather flows were determined from lift station runtime data as shown in Table 6-1. In addition, a storm to dry weather flow ratio was calculated to demonstrate the intense peaks several of the sanitary sewer basins experience during rain events. The results of this analysis reveal that the Seiku LS experienced the greatest I/I impact during storm events based on volume. The data show that the Middle Point LS, Snob Hill LS, and Clallam Bay LS also see significant I/I as well. These areas were selected as the basins to focus on for flow monitoring efforts.

TABLE 6-1

Evaluation of Pump Station Flows for Inflow Peaking

	Basin (subbasin)	Units	Winter Storm Nov. 22, 2017	Winter Dry Dec. 24-28, 2017	Maximum I/I Measured(2)	Storm/ Dry Flow Ratio
Sekiu						
Daily WWTP Base Flow	All	gpd	134,000	38,000		--
Rainfall	All	in/day	1.27	0.0		--
Total Daily WWTP Flow(3)	All	gpd	426,000	38,000		11.2
Sekiu LS	Sekiu LS (Sek7)	gpd	213,600	52,560	161,040	4.1
Middle Point LS	Middle Point LS (Mid1)	gpd	83,160	17,064	66,096	4.9
Snob Hill LS	Snob Hill LS (Sh1)	gpd	120,600	32,400	88,200	3.7
West End LS	West End LS (We1)	gpd	24,900	11,100	13,800	2.2
Clallam Bay						
Daily WWTP Base Flow	All	gpd	55,000	31,600		--
Rainfall	All	avg. in/day	1.27	0.0		--
Total Daily WWTP Flow(3)	All	gpd	293,000	31,600		8.9
Clallam Bay LS	Clallam Bay LS (CB-West6)	gpd	121,800(1)	68,040	53,760	1.79
Lighthouse LS	Lighthouse LS (Light 3)	gpd	30,750	12,750	18,000	2.4

(1) Flow record not available on November 22, 2017, so data from November 23, 2017, was used.
(2) I/I measured represents the difference between the maximum winter storm flow minus the average winter dry flow.
(3) Flows were determined from the treatment plant Daily Monitoring Reports (DMRs). The "Winter Dry" flows were calculated by taking the average daily flow between December 24 and 28, 2017.



N

LEGEND

- Flow Metering Location
- Sewer Manhole
- Force Main
- Sanitary Sewer Pipe
- Lift Station
- Wastewater Treatment Plant

Sewer Basin

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Highway 112
- Lighthouse LS
- Middle Point LS
- Sekiu Airport Rd
- Sekiu LS
- Snob Hill LS
- West End LS
- Sewer Service Area
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-1
FLOW MONITORING LOCATIONS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-1 Flow Monitoring Locatoins.mxd

In order to approximate the quantity of flow that is entering the system during precipitation events as I/I relative to the base flow during dry weather, flow monitoring should capture periods of dry and wet weather. Table 6-2 lists the wet and dry weather flows measured during the flow monitoring period as well as a ratio that compares the maximum wet weather flow recorded versus dry weather flow. It should be noted that the flow metering occurred during the time of year when groundwater may potentially be at a high level which may affect the "winter dry" level flows.

TABLE 6-2

Collection System Flow Monitoring Data

Location	Manhole	Basin	Pump Station Tributary	Flow Meter Installed	Flow Meter Removed	Daily Flows			Ratio Inst. Max/Dry Weather	Daily Precip. (in)
						Avg Dry Day[(1)] (gpm)	Inst. Max[(2)] (gpm)	Max Daily (gpm)		
Site 10	7.03	Sekiu LS	Sekiu LS	04/06/18	04/23/18	15.2	142.7	59.0	9.4	2.18
Site 11	4.09	Sekiu Airport Road	—	04/06/18	04/23/18	9.1	278	103.0	30.7	2.18
Site 12	7.05	Sekiu LS	Sekiu LS	04/06/18	04/23/18	2.7	25.0	13.4	9.1	0.76
Site 13	3.06	Snob Hill LS	Snob Hill LS	04/24/18	05/11/18	9.2	13.8	9.5	1.5	0.11
Site 14	13.03	Middle Point LS	Middle Point LS	04/24/18	05/11/18	7.0	27.8	13.8	4.0	0.5
Site 15	7.05	Sekiu LS	Sekiu LS	04/24/18	05/11/18	7.1	(3)	(3)	(3)	—
Site 16	26.01	Clallam Bay West	Clallam Bay LS	05/11/18	06/05/18	10.7	(4)	(4)	(4)	—
Site 17	18.02	Clallam Bay East	Clallam Bay LS	05/11/18	06/05/18	8.7	(4)	(4)	(4)	—
Site 18	19.05	Clallam Bay East	Clallam Bay LS	05/11/18	06/05/18	7.3	(4)	(4)	(4)	—

(1) Average flow represents the average flow during a dry day throughout the flow monitoring period.
(2) Maximum flow represents the highest instantaneous flow during a precipitation event.
(3) Flow metering data was inconclusive.
(4) Metered flow during the small precipitation events that occurred June 1 through 5, 2018, was not higher than the typical flow seen the previous days.

The full compilation of flow meter data is provided in the I/I Study. Based on the data collected, the following was concluded:

1. The highest I/I flows (~269 gpm) came from the Sekiu Airport Road Basin (Manhole 4.09).

2. The second highest I/I flows (~127 gpm) came from the area north of Manhole 7.03 located in the privately owned Van Riper's Resort region. This coincides with the pump station run time data from Table 2-1 that shows the Sekiu Lift Station as having the largest volume of I/I flows of all the lift stations monitored.

3. The Snob Hill and Middle Point Lift Station areas also have I/I issues although they do not appear to be as great as the Sekiu Airport Road Basin or the Sekiu Lift Station Basin.

4. In general, based on pump station run time data and flow monitoring results, Sekiu appears to have more of an I/I issue than Clallam Bay. However, there was very little precipitation during the flow metering period for the Clallam Bay region. Therefore, a definitive conclusion on I/I issues cannot be drawn from the flow metering data alone and further investigation within Clallam Bay may be warranted.

5. A number of sources of I/I may come from private properties such as RV resorts. The County will need to work with private property owners on methods to help eliminate I/I sources such as placing cleanout caps on pipes and replacing any leaking pipes that may exist.

SMOKE TESTING

Smoke testing of the Clallam Bay and Sekiu sewer systems was conducted June 21 and 22, 2018. Smoke testing is a typical means of conducting a physical assessment of a wastewater collection system. Smoke testing locates potential sources of I/I by blowing artificial smoke into the collection system, typically at a manhole, and visually observing where the smoke escapes. Visible smoke can indicate breaks in the collection system as well as cross connections between the sewer system and storm drain systems and roof drains. Smoke testing is a relatively quick way of ascertaining where in the collection system potential I/I sources exist and is normally used in conjunction with more precise means of locating I/I sources, such as CCTV inspection.

The smoke testing covered approximately 137 acres within Sekiu and included 12,290 linear feet of gravity sanitary sewer mains. For Clallam Bay, the testing covered approximately 167 acres and included 15,390 linear feet of gravity sanitary sewer mains. Figures 6-2 through 6-8 present the locations of the smoke insertion points as well as the results of the smoke testing. These figures identify every point where staff members saw

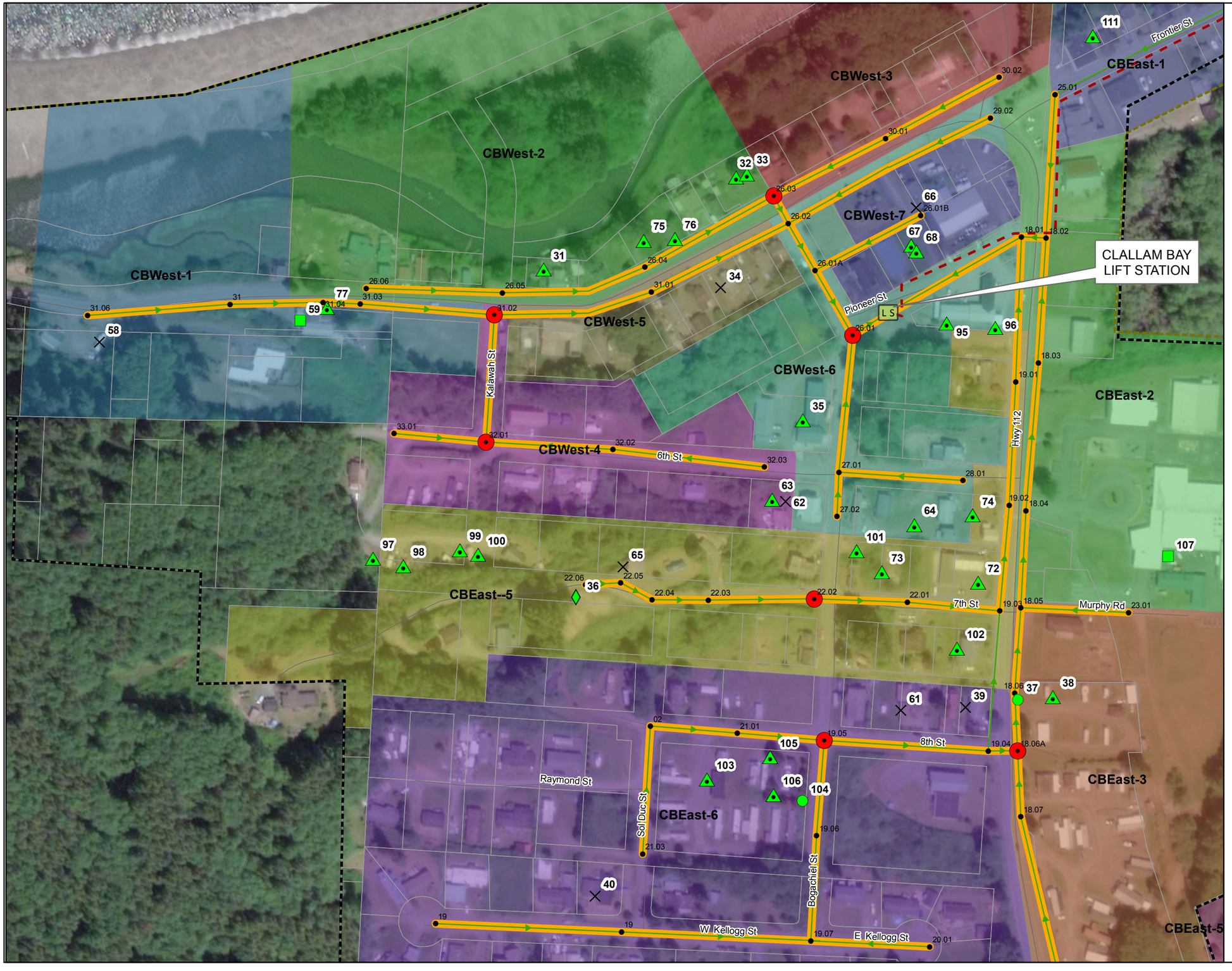
smoke which may not necessarily reflect an I/I source. In analyzing these locations, the testing revealed 32 locations where inflow could potentially enter the Clallam Bay collection system and 58 locations where inflow could potentially enter the Sekiu collection system. The combined 90 problem areas identified in the two systems included one area drain on School District property with direct connection to the sanitary sewer, 81 privately owned cleanouts that were either broken or without covers, and eight manholes. Table 6-3 summarizes the types of potential inflow locations that were discovered for both Clallam Bay and Sekiu.

TABLE 6-3

Results of 2018 Smoke Testing – Summary

Basin	Observed Sources of Smoke			
	Cleanouts	**Area Drains**	**Manholes**	**Total**
Clallam Bay				
Clallam Bay East	12	1	2	15
Clallam Bay West	13			13
Lighthouse Lift Station	4			4
Total (Clallam Bay)	**29**	**1**	**2**	**32**
Sekiu				
Sekiu Airport Road	15			15
Middle Point Lift Station	6		1	7
Sekiu Lift Station	25		1	26
Snob Hill Lift Station	6		4	10
Total (Sekiu)	**52**	**1**	**6**	**58**

Tables summarizing the individual smoke testing results along with the field forms and related pictures are included in the I/I Study in Appendix E. It is estimated that through the sources identified during the smoke testing, approximately 3,700 gpd of inflow is present in the Clallam Bay area during a large storm event. The majority of this is likely due to an open area drain in the school parking lot within the Clallam Bay East Lift Station Basin (reference number 107 in Subbasin CBEast-2 within the I/I Study). A significant amount of inflow is estimated in the Sekiu system. Approximately 245,000 gpd (or 170 gpm) was estimated to occur within the Sekiu system during a large storm event via sources identified during the smoke testing. The majority of this flow is anticipated to enter the sewer system through holes located in the sides of the manholes in the Snob Hill Lift Station Basin (reference numbers 13, 15, 47, and 48 in Subbasin SH-1 within the I/I Study). However, this assumes that the adjacent roadside ditch fills high enough for water to enter these holes. County Staff indicate that WSDOT stormwater culverts located downstream of the sewer manholes appear to be undersized which would cause water to backup within the ditch and flow into the holes on the sides of the manholes.



LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- CBEast--5
- CBEast-1
- CBEast-2
- CBEast-3
- CBEast-4
- CBEast-5
- CBEast-6
- CBEast-7
- CBWest-1
- CBWest-2
- CBWest-3
- CBWest-4
- CBWest-5
- CBWest-6
- CBWest-7

- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 100 200 400 Feet

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-2
SMOKE TESTING RESULTS
(CB East and CB West Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-2 Smoke Test Results Fig CB East.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Light1
- Light2
- Light3
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 60 120 240 Feet

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-3
SMOKE TESTING RESULTS
(Lighthouse Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-3 Smoke Test Results Fig Lighthouse.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Air1
- Air2
- Air3
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 50 100 200 Feet

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-4
SMOKE TESTING RESULTS
(Airport Rd Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-4 Smoke Test Results Fig Airport.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Mid1
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 87.5 175 350 Feet

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-5
SMOKE TESTING RESULTS
(Middle Point LS Subbasin)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-5 Smoke Test Results Fig Middle Pt.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Sek2
- Sek3
- Sek-F1
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 30 60 120 Feet

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-6
SMOKE TESTING RESULTS
(Sek2, Sek3, Sek-F1 Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-6 Smoke Test Results Fig Sekiu North.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Sek6
- Sek5
- Sek4
- Sek-F4
- Sek7

- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 30 60 120 Feet

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-7
SMOKE TESTING RESULTS
(Sek5, Sek6, Sek7, Sek-F4 Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-7 Smoke Test Results Fig Sekiu South.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- SH-F1
- SH1
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 195 390 780 Feet

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-8
SMOKE TESTING RESULTS
(SH1, SH-F1 Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-8 Smoke Test Results Fig Sekiu Snob Hill.mxd

MANHOLE INSPECTIONS

Manhole inspections are useful for determining potential sources of I/I. These inspections allow for visual inspection of flow as well as observation of any deterioration of the manhole that may allow inflow or infiltration. Manhole inspections were performed on May 10 and 11, 2018. There were periods of light, scattered precipitation during the two days of inspection. Recorded conditions for the KWASEKIU8 weather station, located three miles west of Sekiu/Clallam Bay, are summarized in Table 6-4 below.

TABLE 6-4

Weather Summary(1) During Manhole Inspections

	May 10, 2018	May 11, 2018
Average Temperature (°F)	53.8	56.8
Total Precipitation (in)	0.08	0

(1) Recorded conditions at personal weather station KWASEKIU8.

Inspections were performed on 33 manholes, revealing potential I/I, structural, or other problem areas. Manholes in which problems were identified were then rated on a scale of one to three, with three being the most severe. Figures 6-9 and 6-10 identify the results of these rankings. Table 6-5 shows the manholes with "severe" ratings and the identified problems associated with these manholes. A common problem seen include grade rings for the manholes that were separated which could be a source of I/I, especially within low spots. A complete list of all manhole inspections is included in the I/I Study in Appendix E.

TABLE 6-5

Severe Problems Identified from Manhole Inspections

Manhole ID	Problems Identified
4.10	Visible infiltration, potential inflow.
7.07	Gaps in riser joints, grout falling apart, high potential for infiltration.
18.02	Grout falling apart, large seepage of soil with iron oxide in through the manhole walls, high potential for infiltration.
25.03	Hole in manhole, high potential for infiltration.

CLOSED CIRCUIT TELEVSION (CCTV)

Closed circuit television (CCTV) was used to investigate I/I sources. A CCTV camera is sent through sewer pipes which allows observation of potential leaks, pipe/joint deterioration, separated joints, and root intrusions. Pipes within the Sekiu and Clallam Bay sewer systems were videoed on August 28 – September 6, 2018 in the locations

shown in Figures 6-11 through 6-14. In general, the gravity system had not been cleaned since it was installed in the 1970s; and therefore, a rigorous cleaning had to take place prior to the pipes being videoed. Staff noted that in general, very large amounts of "black rock" existed along the Snob Hill trunk line and was largely blocking the piping system. Likewise, Middle Point also had a lot of debris within it, possibly from construction. They also noted that generally, the risers within the manhole had separation and were likely a source of I/I.

Potential conveyance system repairs or replacements were identified based on the CCTV inspection. The following assumptions were used when determining recommended conveyance system solutions ideintified in the CCTV inspection.

- Side sewer replacement include only repairing 5 LF of pipe right at the connection to the main sewer line.

- Manholes that have I/I potential due to evidence of leaks or visual separation in the grade rings would be replaced, rather than repaired, due to the age of the system.

- Pipe repairs/replacements range from fixing the joints between two pipes to replacing the full stretch of sewer main from the upstream manhole to the downstream manhole.

Specific areas of pipe repair/replacement include the following.

- **Middle Point LS Basin:**

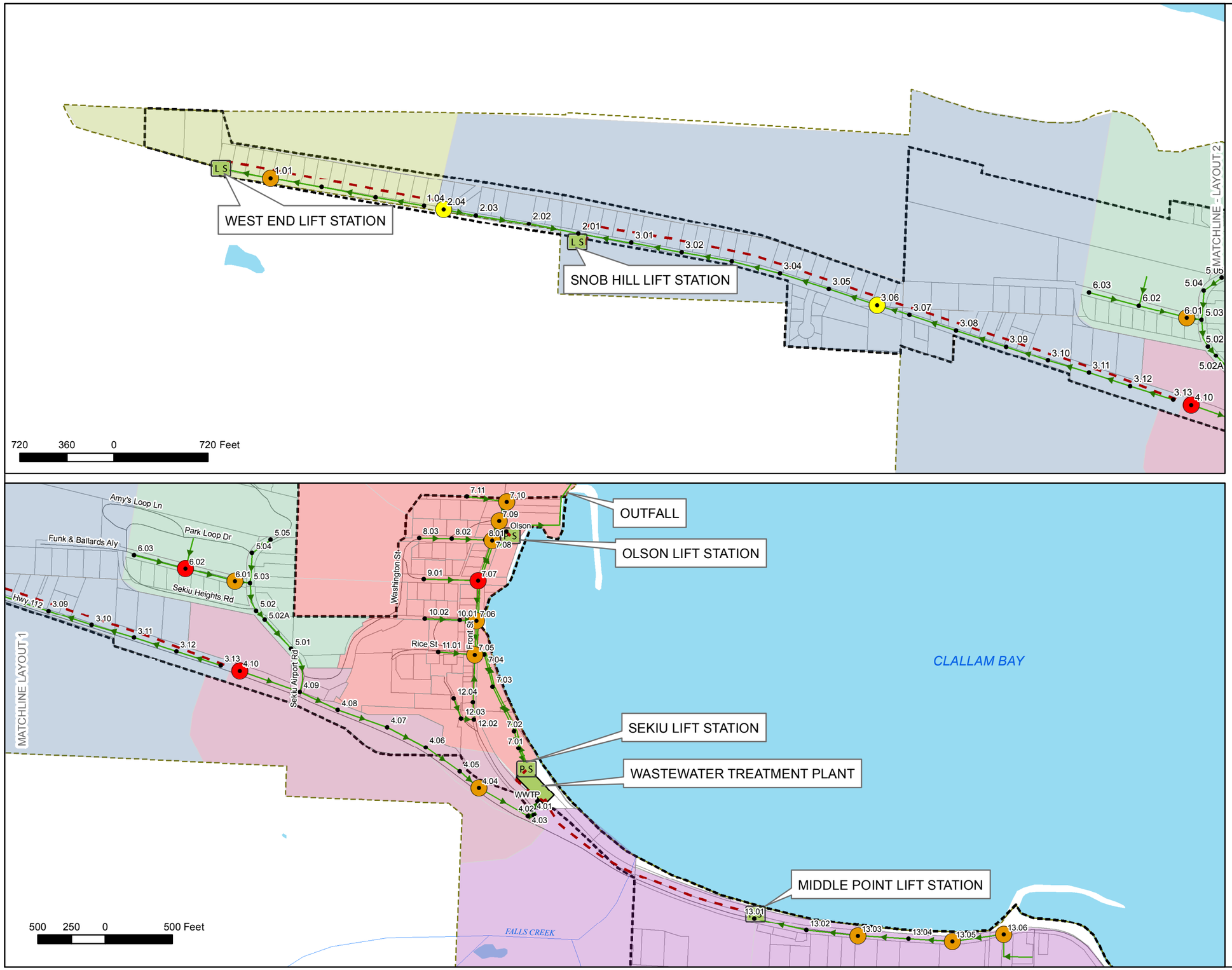
    - Install 120 feet of new pipe to remove the "S" bend located between MH 13.06 and 13.05 – a source of blockage evident in the CCTV inspection.

- **Sekiu LS Basin:**

    - Joints appeared barely separated between MH 7.07 and 7.06. Assumed to be a potential project for the near future.

- **Snob Hill Basin:**

    - Replace four manholes that have holes in the cones (first priority). Full pipe replacement of aged, corroding pipe for all concrete pipes within the Snob Hill LS Basin, total 5,845 LF (second priority).



N

LEGEND

Manhole Inspection Rating

- 1: Less Severe
- 2: Somewhat Severe
- 3: Most Severe
- Sewer Manhole
- Force Main
- Sanitary Sewer Pipe
- Lift Station
- Wastewater Treatment Plant

Sewer Basin

- Highway 112
- Middle Point LS
- Sekiu Airport Rd
- Sekiu LS
- Snob Hill LS
- West End LS
- Sewer Service Area
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-9
MANHOLES INSPECTED (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-9 Manhole Inspection Figure.mxd

OUTFALL

CLALLAM BAY

CLALLAM RIVER

WASTEWATER TREATMENT PLANT

LIGHTHOUSE LIFT STATION

CLALLAM BAY LIFT STATION

Salt Air St

Frontier St

Pioneer St

6th St

7th St

8th St

Hwy 112

Raymond St

Soi Duc St

Bogachiel St

W Kellogg St

Eagle Crest Way

Weel Rd

PEARSON CREEK

16.03 16.02 17.01 17.02 15.04 15.05 16.01 14.04 14.03 14.02 15.03 15.02 L S 15.01

25.03 25.02 30.02 25.01 30.01 29.02 26.03 26.02 26.01B 18.01 18.02 26.04 31.01 26.06 26.05 31.06 31 31.04 31.03 31.02 26.01A 33.01 32.01 32.02 32.03 27.01 27.02 28.01 19.02 18.04

22.06 22.05 22.04 22.03 22.02 22.01 19.03 23.01 18.05 18.06 02 21.01 19.05 19.04 18.06A 18.07 21.03 19.06 19 19 W Kellogg St 19.07 20.01

24.01 18.08 24.02 18.09 18.12 18.10 18.11 24.03

N

0 250 500 1,000 Feet

LEGEND

Rating

- 1: Less Severe
- 2: Somewhat Severe
- 3: Most Severe

Sewer Basin

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Lighthouse LS
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- L S Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-10
MANHOLES INSPECTED (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-10 Manhole Inspection Figure Clallam.mxd

N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

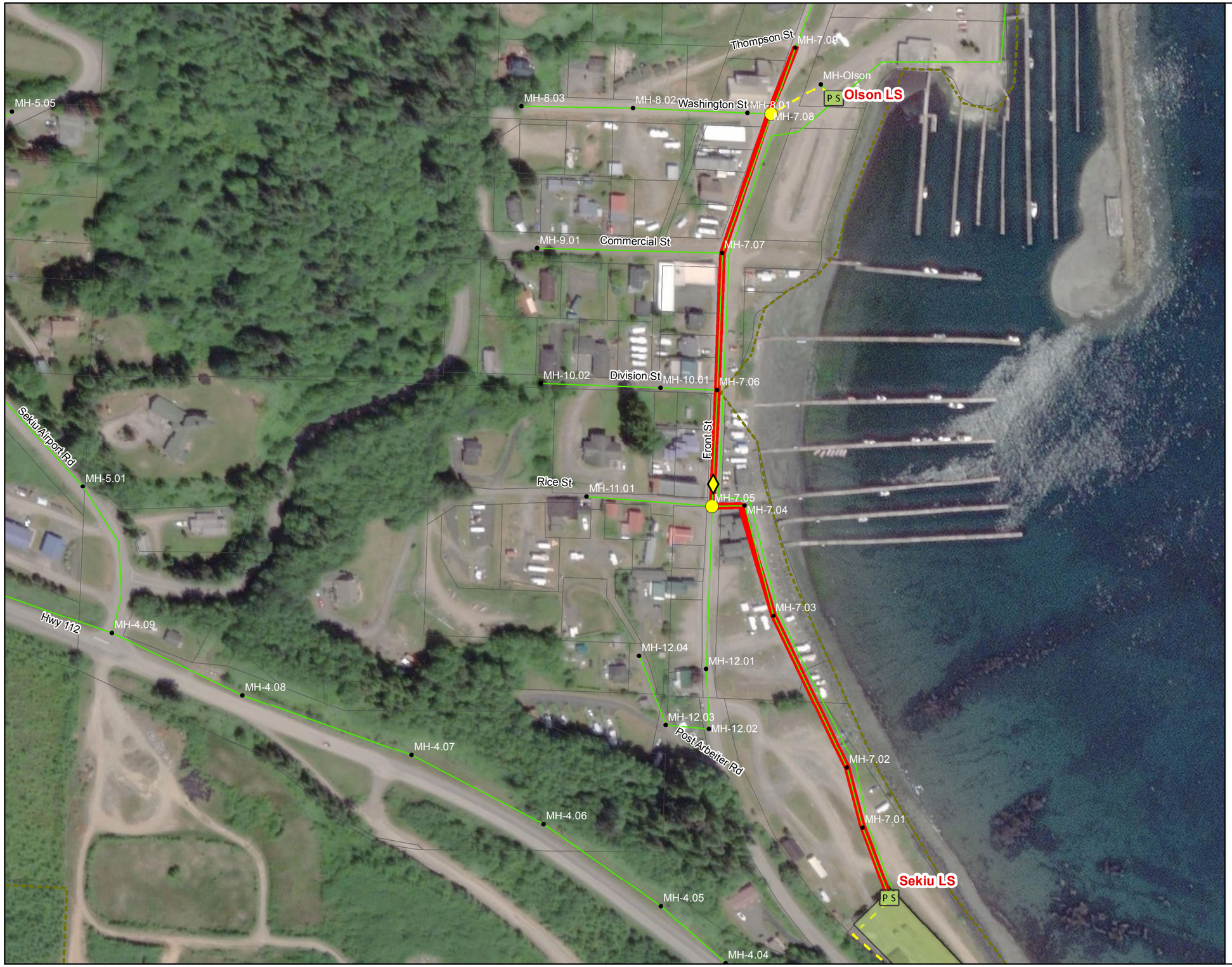
- Recommended MH Repair
- Recommended Pipe Repair
- Recommended Side Sewer Repair
- CCTV Pipe Results
- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU
GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-11
SEWER CCTV INSPECTION RESULTS
(MIDDLE POINT)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-11 TV map.mxd



N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

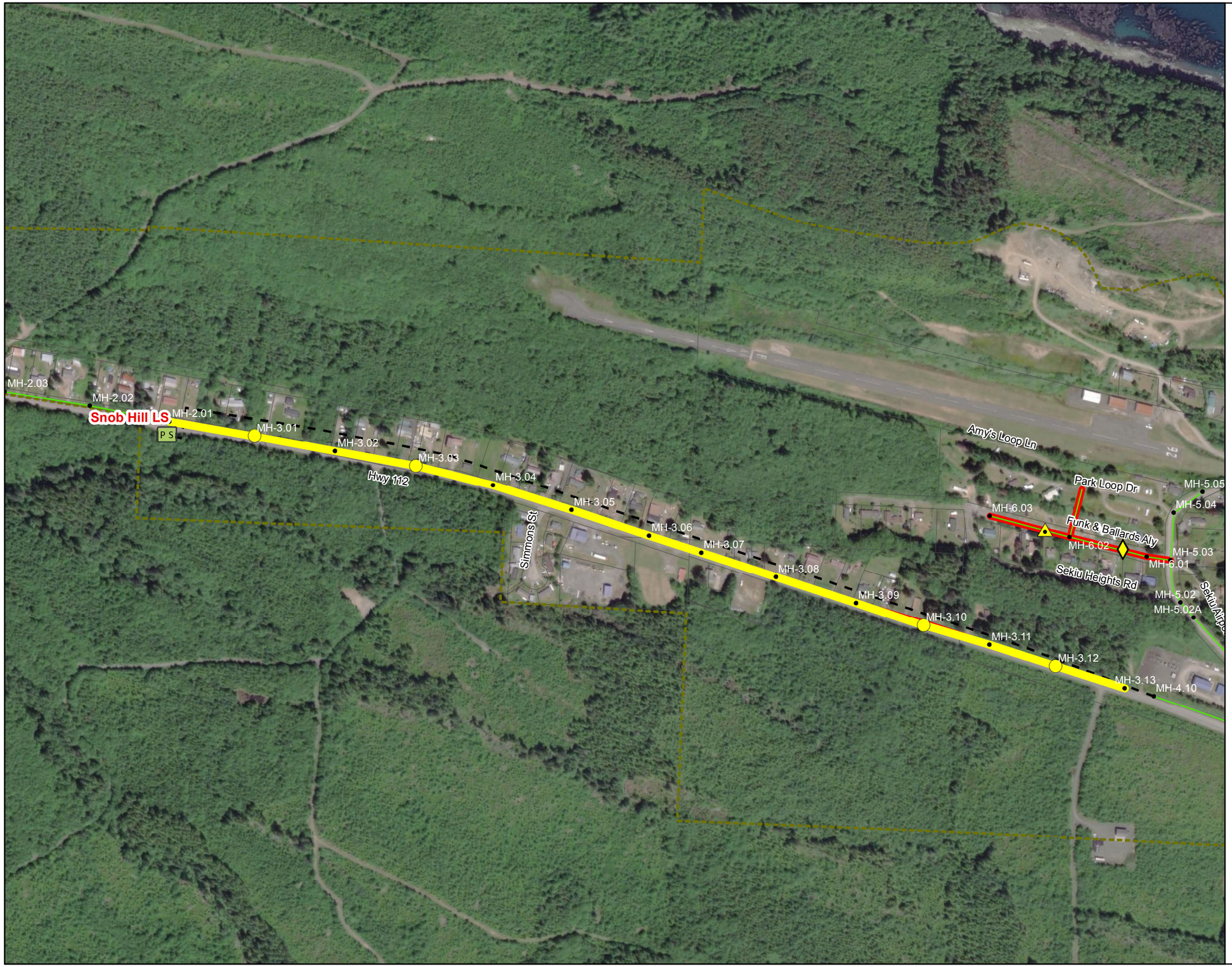
- Recommended MH Repair
- Recommended Pipe Repair
- Recommended Side Sewer Repair
- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-12
SEWER CCTV INSPECTION RESULTS
(FRONT ST.)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-12 TV map front st.mxd



N

0 250 500 1,000
Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- Recommended MH Repair
- Recommended Pipe Repair
- Recommended Side Sewer Repair
- Pipe Repair
- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-13
SEWER CCTV INSPECTION RESULTS
(SNOB HILL)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-13 TV map snob hill.mxd

N

0 75 150 300 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- MH Repair
- Spot Pipe Repair
- Side Sewer Repair
- Pipe Repair

Videoed Sewer Pipe

- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-14
SEWER CCTV INSPECTION RESULTS
(BOGACHIEL ST.)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-14 TV map bogachiel.mxd

- **Sekiu Airport Road Basin:**

    - Install a flexible coupling between two PVC pipes located approximately 276 feet downstream of MH 6.02. Joint is separated allowing either sewage to flow out or infiltration of groundwater to enter into the pipe.

    - Repair the pulled joint at the side sewer connection upstream of MH 6.02.

A summary of the recommendations resulting from the CCTV inspection is shown in Table 6-6.

TABLE 6-6

Recommended Conveyance Solutions Resulting from CCTV Inspection

Basin	Replace Side Sewer	Repair/Replace MH	Replace Pipe Segment (LF)
Sekiu			
Middle Point Lift Station	2	2	120
Sekiu Lift Station	--	2	275
Snob Hill Lift Station	21	14	5,845
Sekiu Airport Road	1	--	5
Total	**24**	**18**	**6,245**

HYDRAULIC MODEL

The capacity of the sanitary sewer collection system was analyzed. The components of the collection system were organized into three categories for the evaluation:

- Major Gravity Lines
- Force Mains
- Sewage Lift stations

A spreadsheet model has been used to analyze the capacity of the major gravity lines within the collection system to determine the available capacity to accommodate current conditions (2018) and future conditions (2038). A capacity analysis of the force mains and sewage lift stations was completed assuming estimated peak wet weather flows for 2038 conditions. It should be noted that current lift station capacities were not confirmed by drawdown tests. It is recommended that drawdown tests be performed to determine the capacity of the existing pumps within the lift stations.

MAJOR GRAVITY LINES

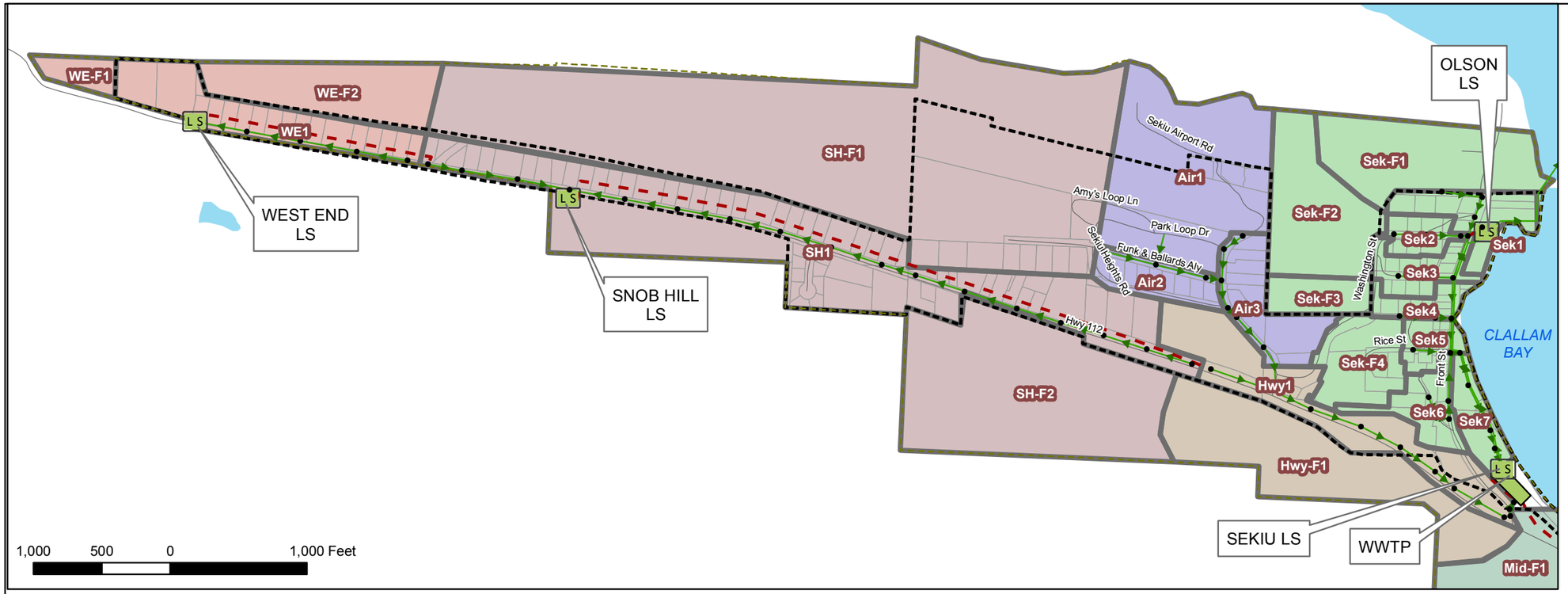
The spreadsheet model was used to evaluate the capacity of the collection system to accommodate projected future flows. The collection system was split into 25 subbasins for Clallam Bay and 26 subbasins for Sekiu (see Figures 6-15 and 6-16). For each subbasin, the gravity pipe with the lowest slope and smallest diameter based on record drawings was selected for analysis. The capacity of the pipe segment was calculated using Manning's Equation assuming a Manning's n value of 0.013. The calculated capacity was compared to the projected flows for that pipe segment.

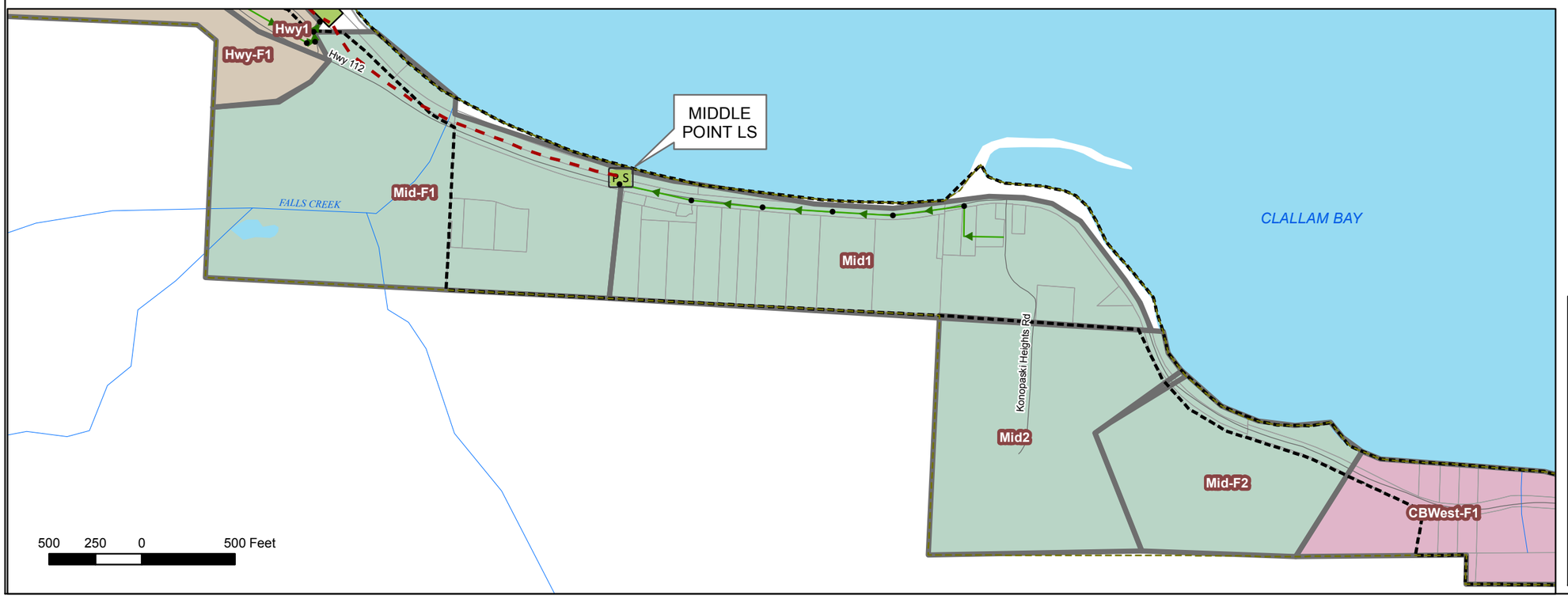
Model Assumptions

The model is broken into two flow values: (1) the base flow consisting of only sanitary sewer flow originating from residential and commercial properties; and (2) estimated I/I flow – non-sanitary sewer flow introduced from outside sources such as rainwater and groundwater.

Projected sewer base flows for each subbasin were calculated from the current and projected ERU values and flow/ERU given in Chapter 5. It should be noted that single-family residents were assigned 1 ERU while each individual RV site and motel room were discounted to 0.6 ERUs. The number of ERUs for each subbasin were multiplied by the average flow value of 158 gpd/ERU for Sekiu and 98 gpd/ERU for Clallam Bay to give an average day domestic flow value for that subbasin. The average day flow was then peaked with a standard diurnal peaking factor of 2 to obtain a peak hour base daily flow.

The second flow component of the hydraulic model is I/I flow. Calculations used to estimate I/I are shown in Table 6-7. A peak hour I/I flow rate was not possible to observe due to the lack of hourly pump run-time readings (only daily run-time data is available). Therefore, pump run times were utilized to determine the daily I/I attributable to each lift station basin during the large rain event that occurred on November 22, 2017. The total daily I/I from all of the lift stations was summed and a percent allocation was calculated to determine the amount of I/I that was attributable to each sewer basin during that peak event (i.e., West End LS contributed 3.0 percent of the I/I volume, Snob Hill contributed 16.2 percent of the I/I volume, etc.). Flow meter data from April 14, 2018 (shown to be 100 gpm or 144,980 gpd) was evaluated to approximate the amount of I/I that would occur in the Sekiu Airport Road basin during a similar type of storm. The percent allocations for each of the basins was multiplied by the peak hour I/I rates estimated at the treatment plants (Tables 5-10 and 5-11), multiplied by the total acreage in Sekiu or Clallam Bay and divided by the number of acres within the basin to give a basin specific peak hour I/I rate in gpad. This basin specific, peak hour I/I rate was applied in the hydraulic model to the current and future scenarios. The model is conservative in that it does not assume that that the I/I reduction measures the County is intending to implement will be successful.





N

LEGEND

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Clallam County Correc. Ctr
- Highway 112
- Lighthouse LS
- Middle Point LS
- Sekiu Airport Rd
- Sekiu LS
- Snob Hill LS
- West End LS
- Sewer Subbasin
- SEWER MANHOLE
- FORCE MAIN
- SANITARY SEWER PIPE
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-15
SEWER SUBBASINS (SEKIU)

Gray & Osborne, Inc.
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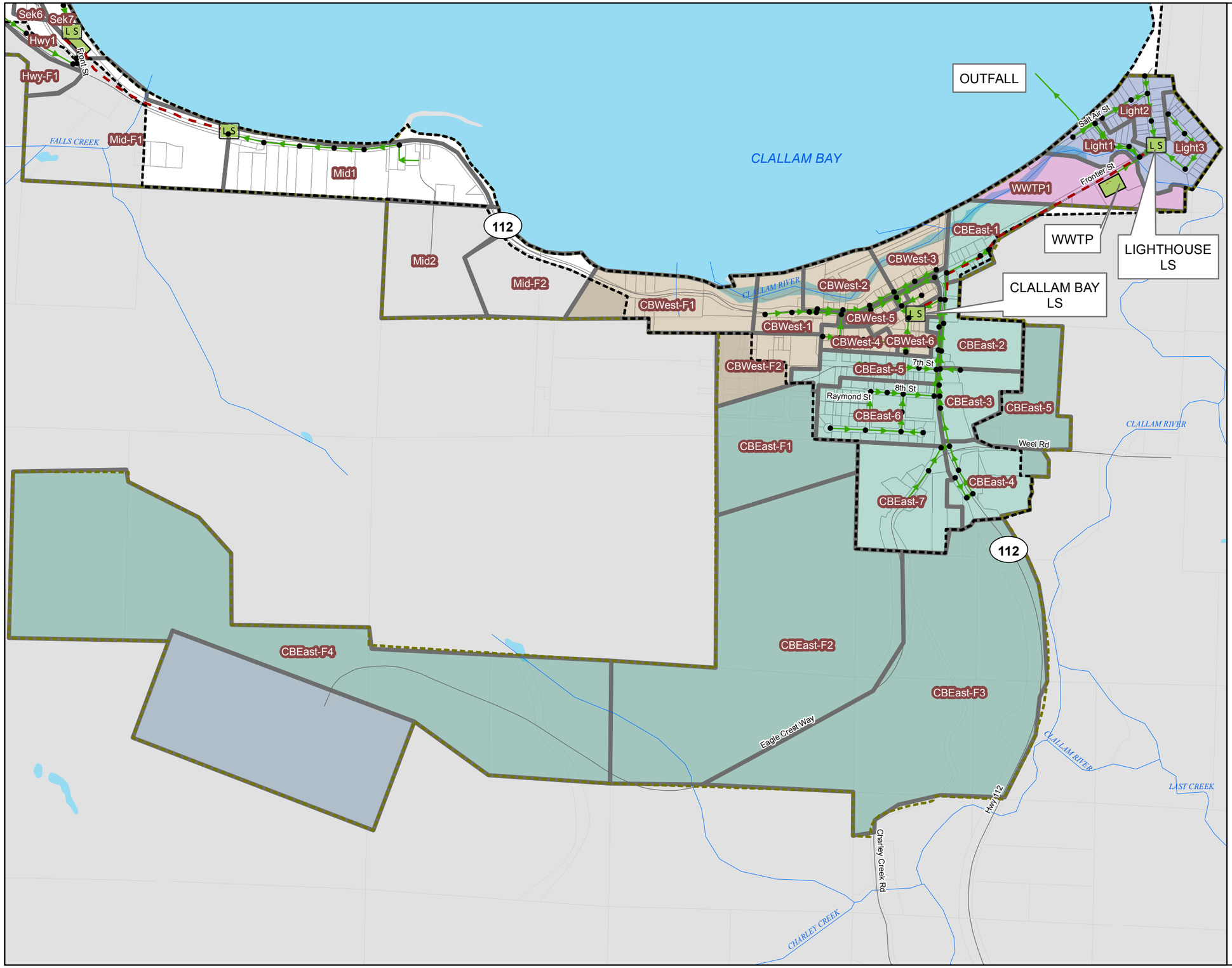
L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-15 Sekiu subbasins.mxd



0 500 1,000 2,000 Feet

N

LEGEND

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Clallam County Correc. Ctr
- Lighthouse LS
- Sewer Subbasin
- SEWER MANHOLE
- SANITARY SEWER PIPE
- FORCE MAIN
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-16
SEWER SUBBASINS (CLALLAM BAY)

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L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-16 Clallam subbasins.mxd

TABLE 6-7

Basin Specific Peak Hour I/I Rates Used for Modeling

Basin	Avg. Daily Dry Winter Flow at LS (gpd)	Peak Daily Flow at LS(1) (gpd)	Peak Daily I/I Flow at LS(2) (gpd)	% of Total I/I at WWTP(3)	Basin Acreage	Calculated Basin Specific Peak Hour I/I Rate(4) (gpad)
Sekiu						
Sekiu LS	52,560	213,600	161,040	35.0%	41.4	**11,142**
Sekiu Airport Road	3,340	148,320	144,980	31.5%	32.0	**12,999**
Snob Hill LS	21,300	95,700	74,400	16.2%	47.6	**4,484**
Middle Point LS	17,064	83,160	66,096	14.4%	40.9	**4,637**
West End LS	11,100	24,900	13,800	3.0%	14.4	**2,741**
Total Sekiu:	--	--	*460,316*	*100%*	*176.2*	**--**
Clallam Bay						
Clallam Bay LS	68,040	121,800	53,760	75%	105.7	**2,454**
Lighthouse LS	12,750	30,750	18,000	25%	31.3	**2,776**
Total Clallam Bay:	--	--	*71,760*	*100%*	*137.0*	**--**

(1) Lift station peak flows were taken from available daily pump run time data from Nov. 22, 2017. The Sekiu Airport Road daily flow was obtained from flow meter data from April 14, 2018.

(2) Daily I/I flow calculated from subtracting the peak daily flow minus the average daily dry winter flow.

(3) The percent allocation was calculated by dividing the peak daily I/I flow for the individual basin by the total I/I in the region (i.e., For the West End LS: 13,800 gpd / 460,316 gpd total = 3.0% of the daily I/I flow for Sekiu).

(4) The basin specific peak hour I/I rate was calculated by taking the percent allocation for the individual basin x the WWTP peak hourly I/I rate (=7,486 gpad for Sekiu and 2,414 gpad for Clallam Bay as shown in Tables 5-10 and 5-11) x total acreage in Sekiu or Clallam Bay / basin acreage. As an example, for the West End LS: 3.0% x (7,486 gpad x 176.2 acres) / 14.4 acres = 2,741 gpad peak hour I/I rate. These rates were used for both current and future modeling scenarios.

Model Results

The output from the hydraulic model is used to evaluate the capacity of the existing collection system and to identify improvements that will be required to accommodate existing and future wastewater flows. The model can be updated and maintained for use as a tool to aid in future planning and design. The results of the hydraulic spreadsheet model are shown in Table 6-8 for Sekiu and Table 6-9 for Clallam Bay. As seen in these

tables, all of the gravity sewer mains appear to be adequately sized to carry current and projected sewer flows under today's I/I conditions.

TABLE 6-8

Sanitary Sewer Model Results for Sekiu

Subbasin[2]	Flow Unit (gpd/ ERU)	No. ERUs[3] (2018)	No. ERUs[3] (2038)	Base Flow (2018) (gpd)	Base Flow (2038) (gpd)	Peak Hour Base Flow (2018) (gpd)	Peak Hour Base Flow (2038) (gpd)	I/I Acreage (ac)	Peak Hour I/I (gpad)	Peak Hour I/I (gpd)	Subbasin Peak Hour Flow (2018) (gpd)	Subbasin Peak Hour Flow (2038) (gpd)	Cumulative Peak Hour Flow[1] (gpd) (2038)	Cumu. Peak Hour Flow[1] (gpm) (2038)	Dia. (in)	Slope (ft/ft)	"n" Value	Pipe Capacity (gpm)	% Pipe Full (2038)
West End LS																			
WE-F1	158	0	1	0	158	0	316	0.25	2,741	685	685	1,001	**1,001**	**1**					
WE-F2	158	0	2	0	316	0	632	0.27	2,741	740	740	1,372	**1,372**	**1**					
WE1	158	11	11	1,738	1,738	3,476	3,476	13.91	2,741	38,121	41,597	41,597	**42,969**	**30**	8	0.120	0.013	1,884	**2%**
Snob Hill LS																			
SH-F1	158	6	12	948	1,896	1896	3,792	10.14	4,484	45,466	47,362	49,258	**49,258**	**34**					
SH-F2	158	0	6	0	948	0	1,896	0.52	4,484	2,332	2,332	4,228	**4,228**	**3**					
SH1	158	40	40	6,320	6320	12,640	12,640	36.89	4,484	165,408	178,048	178,048	**275,503**	**191**	8	0.004	0.013	344	**56%**
Sekiu Airport Road and Highway 112																			
Air1	158	3	3	474	474	948	948	9.77	12,999	127,005	127,953	127,953	**127,953**	**89**					
Air2	158	9	9	1,422	1,422	2,844	2,844	5.85	12,999	76,047	78,891	78,891	**78,891**	**55**	8	0.005	0.013	385	**14%**
Air3	158	5	5	790	790	1,580	1,580	9.31	12,999	121,025	122,605	122,605	**329,449**	**229**	8	0.053	0.013	1,252	**18%**
Hwy1	158	2	2	316	316	632	632	7.03	12,999	91,386	92,018	92,018	**739,939**	**514**	8	0.010	0.013	544	**94%**
Hwy-F1	158	0	3	0	474	0	948	13.00	12,999	168,993	168,993	169,941							
Sekiu LS																			
Sek-F1	158	0	3	0	474	0	948	0.01	11,142	111	111	1,059	**1,059**	**1**					
Sek1	158	4	4	632	632	1,264	1,264	6.64	11,142	73,980	75,244	75,244	**76,304**	**53**	8	0.060	0.013	1,332	**4%**
Sek-F2	158	0	2	0	316	0	632	0.45	11,142	5,014	5,014	5,646	**5,646**	**4**					
Sek2	158	4	4	632	632	1,264	1,264	3.28	11,142	36,544	37,808	37,808	**43,454**	**30**	8	0.102	0.013	1,737	**2%**
Sek3	158	8	8	1,264	1,264	2,528	2,528	4.98	11,142	55,485	58,013	58,013	**177,771**	**123**	8	0.017	0.013	709	**17%**
Sek-F3	158	0	3	0	474	0	948	0.48	11,142	5,348	5,348	6,296	**6,296**	**4**					
Sek4	158	13.6	13.6	2,148.8	2,149	4,298	4,298	3.16	11,142	35,207	39,505	39,505	**223,572**	**155**	8	0.004	0.013	344	**45%**
Sek-F4	158	3	6	474	948	948	1,896	8.78	11,142	97,823	98,771	99,719	**99,719**	**69**					
Sek5	158	3	3	474	474	948	948	3.38	11,142	37,659	38,607	38,607	**361,898**	**251**	8	0.004	0.013	344	**73%**
Sek6	158	6	6	948	948	1,896	1,896	5.64	11,142	62,839	64,735	64,735	**64,735**	**45**	8	0.004	0.013	344	**13%**
Sek7	158	1	1	158	158	316	316	4.62	11,142	51,474	51,790	51,790	**478,423**	**332**	8	0.004	0.013	344	**97%**
Middle Point LS																			
Mid-F1	158	1	3	158	474	316	948	3.64	4,637	16,878	17,194	17,826	**17,826**	**12**	8	0.004	0.013	344	**4%**
Mid1	158	21.2	21.2	3,349.6	3,350	6,699	6,699	37.14	4,637	172,206	178,906	178,906	**178,906**	**124**	8	0.004	0.013	344	**36%**

(1) Cumulative flow includes the upstream subbasins in the flow calculation.
(2) "F" within the subbasin name denotes a future service area that is not currently being serviced.
(3) ERUs determined by assigning 1 ERU per single-family residence and applying 0.6 ERUs per RV space and motel room.

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TABLE 6-9

Sanitary Sewer Model Results for Clallam Bay

Subbasin[2]	Flow Unit (gpd/ ERU)	No. ERUs[3] (2018)	No. ERUs[3] (2038)	Base Flow (2018) (gpd)	Base Flow (2038) (gpd)	Peak Hour Base Flow (2018) (gpd)	Peak Hour Base Flow (2038) (gpd)	I/I Acreage (ac)	Peak Hour I/I (gpad)	Peak Hour I/I (gpd)	Subbasin Peak Hour Flow (2018) (gpd)	Subbasin Peak Hour Flow (2038) (gpd)	Cumulative Peak Hour Flow[1] (gpd) (2038)	Cumu. Peak Hour Flow[1] (gpm) (2038)	Dia. (in)	Slope (ft/ft)	"n" Value	Pipe Capacity (gpm)	% Pipe Full (2038)
Clallam Bay LS (East)																			
CBEast-F2	98	0	18	0	1764	0	3528	8.00	2,454	19,632	19,632	23,160	**23,160**	**16**					
CBEast-7	98	3	9	294	882	588	1764	10.11	2,454	24,810	25,398	26,574	**49,734**	**35**	8	0.004	0.013	344	**10%**
CBEast-F3	98	0	18	0	1764	0	3528	0.57	2,454	1,399	1,399	4,927	**4,927**	**3**					
CBEast-4	98	22	22	2156	2156	4312	4312	11.00	2,454	26,994	31,306	31,306	**36,233**	**25**	8	0.004	0.013	344	**7%**
CBEast-5	98	0	3	0	294	0	588	0.70	2,454	1,718	1,718	2,306	**2,306**	**2**					
CBEast-3	98	18	18	1764	1764	3528	3528	11.43	2,454	28,049	31,577	31,577	**176,426**	**123**	8	0.004	0.013	344	**36%**
CBEast-6	98	40	40	3920	3920	7840	7840	19.86	2,454	48,736	56,576	56,576	**56,576**	**39**	8	0.004	0.013	344	**11%**
CBEast--5	98	13	13	1274	1274	2548	2548	11.31	2,454	27,755	30,303	30,303	**30,303**	**21**	8	0.004	0.013	344	**6%**
CBEast-2	98	4.57	4.57	447.86	447.86	896	896	13.59	2,454	33,350	34,246	34,246	**297,551**	**207**	8	0.004	0.013	344	**60%**
Clallam Bay LS (West)																			
CBWest-1	98	5	5	490	490	980	980	6.09	2,454	14,945	15,925	15,925	**15,925**	**11**	8	0.004	0.013	344	**3%**
CBWest-5	98	7	7	686	686	1372	1372	2.23	2,454	5,472	6,844	6,844	**22,769**	**16**	8	0.004	0.013	344	**5%**
CBWest-2	98	9	9	882	882	1764	1764	4.22	2,454	10,356	12,120	12,120	**12,120**	**8**	8	0.004	0.013	344	**2%**
CBWest-3	98	3	3	294	294	588	588	2.14	2,454	5,252	5,840	5,840	**5,840**	**4**	8	0.004	0.013	344	**1%**
CBWest-F2	98	0	8	0	784	0	1568	0.84	2,454	2,061	2,061	3,629	**3,629**	**3**					
CBWest-4	98	6.4	6.4	627.2	627.2	1254	1254	4.94	2,454	12,123	13,377	13,377	**17,007**	**12**	8	0.011	0.013	570	**2%**
CBWest-7	98	7	7	686	686	1372	1372	1.79	2,454	4,393	5,765	5,765	**5,765**	**4**	8	0.004	0.013	344	**1%**
CBWest-6	98	4	4	392	392	784	784	6.94	2,454	17,031	17,815	17,815	**378,128**	**263**	8	0.004	0.013	344	**76%**
Lighthouse LS																			
Light1	98	10	10	980	980	1960	1960	7.22	2,776	20,041	22,001	22,001	**22,001**	**15**	8	0.004	0.013	344	**4%**
Light2	98	27	27	2646	2646	5292	5292	9.87	2,776	27,397	32,689	32,689	**32,689**	**23**	8	0.004	0.013	344	**7%**
Light3	98	39	39	3822	3822	7644	7644	12.38	2,776	34,365	42,009	42,009	**42,009**	**29**	8	0.004	0.013	344	**8%**

(1) Cumulative flow includes the upstream subbasins in the flow calculation.
(2) "F" within the subbasin name denotes a future service area that is not currently being serviced.
(3) ERUs determined by assigning 1 ERU per single-family residence and applying 0.6 ERUs per RV space and motel room.

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LIFT STATION CAPACITY ANALYSIS

The County operates and maintains two lift stations in Clallam Bay and five lift stations in Sekiu. Table 6-10 shows the capacity analysis for each of the lift stations.

The peak flows developed for the 2018 and 2038 scenarios are compared to the capacity of each of the lift stations in Table 6-10. For the 2038 scenario, capacity surplus or deficiency is determined. It should be noted that a drawdown test was not conducted for any of the stations and therefore, the surplus capacity shown in the table may not reflect actual conditions. A drawdown test is recommended to confirm the available capacity within each station.

As shown in Table 6-10, only the Sekiu LS is shown to be at capacity. Run time data for this station also suggests that it may be near or over capacity. However, the County is intending to implement I/I reduction efforts upstream which may recover additional capacity. It is recommended that all lift stations in Sekiu and Clallam Bay systems be upgraded due to aged infrastructure. A more detailed assessment of the existing lift stations is provided later in this Chapter. Flow monitoring just upstream of the Sekiu LS should be conducted prior to selecting an appropriate pump for a future station.

TABLE 6-10

Lift Station Capacity Analysis(1)

Lift Station	Total 2018 Peak Flow (gpm)	Total 2038 Peak Flow (gpm)	Lift Station Capacity(2) (gpm)	2038 Surplus (+)/ Deficit (-) (gpm)
Sekiu				
Westend LS	29	30	50	(+) 20
Snob Hill LS	187	191	300	(+) 109
Sekiu LS	323	332	200	**(-) 132**
Middle Point LS	124	124	180	(+) 56
Olson LS	26	26	180	(+) 154
Clallam Bay				
Clallam Bay LS	238	263	350	(+) 87
Lighthouse Addition LS	67	67	125	(+) 58

(1) Shaded cells represents lift stations shown to be undersized within the model and should be monitored for capacity issues in the future.

(2) The lift station capacity was not confirmed with a drawdown test. Future analysis should include a drawdown test to confirm the pump capacities of each lift station.

FORCE MAIN CAPACITY EVALUATION

The capacity evaluation for the force mains is tied directly to the lift station capacity evaluation. The minimum recommended force main flushing velocity is 2 feet per second (fps). The maximum recommended velocity is 8 fps to prevent scouring of the

pipes under high flows. The estimated velocity for each lift station, assuming full pump capacity is shown in Table 6-11.

TABLE 6-11

Force Main Capacity Analysis

Lift Station	Existing Lift Station Capacity (gpm)	Force Main Diameter (in)	Estimated Velocity in Force Main[(1)] (fps)
Sekiu			
Westend LS	50	4	1.3
Snob Hill LS	300	8	1.9
Sekiu LS	200	6	2.2
Middle Point LS	180	6	2.0
Olson LS	180	4	4.5
Clallam Bay			
Clallam Bay LS	350	8	2.1
Lighthouse Addition LS	125	4	3.1

(1) Velocity greater than 2 fps is recommended to keep pipes flushed and velocity less than 8 fps is recommended to keep pipes from being scoured.

As shown in Table 6-11, all force main capacities are assumed to be adequate as they exceed the current lift station capacity for all lift stations.

As discussed above, the capacity of the Sekiu LS may need to be increased in the future. The existing 6-inch force main can handle up to 718 gpm of flow before the recommended maximum velocity is reached.

COLLECTION SYSTEM IMPROVEMENT SUMMARY

A summary of the recommended improvements to the gravity collection system based upon the I/I investigation, model results, and general field investigations are described in Table 6-12 and are shown in Figures 6-17 through 6-20. CIPs 1 through 7 represent fairly low cost opportunities to reduce I/I within the Sekiu and Clallam Bay systems in the immediate future. Additional improvements include replacement of all the concrete pipe within the system. The concrete pipe has reached the typical useful life of concrete pipe of 50 years. There is an estimated 32,000 linear feet of concrete pipe remaining in the Sekiu and Clallam Bay sewer systems. Recognizing that I/I is more excessive in certain basins, CIPs 8 through 13 were prioritized based on severity of I/I – from CIP 8 (Sekiu LS Basin Pipe Replacements) which is located in the basin with the worst I/I to CIP 13 (Lighthouse LS Basin Pipe Replacements) which is located in the basin that has the least I/I as determined by this analysis. A detailed cost analysis for the recommended CIPs is provided in Appendix F and a timeline for improvements is presented in the

N

0 100 200 400 Feet

LEGEND

- CIP 1: Cleanout Replacements
- CIP 5: Middle Pt LS I/I Imp. (MH Repair)
- CIP 5: Middle Pt LS I/I Imp. (Spot Pipe Repair)
- CIP 5: Middle Pt LS I/I Imp. (Side Sewer Repair)
- L S CIP 15: Middle Point LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- Parcel
- UGA Boundary

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-17
CONVEYANCE CIPS
(MIDDLE POINT)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-17 CIP map.mxd

N

Feet

0 100 200 400

LEGEND

- CIP 1: Cleanout Replacements
- CIP 1: I/I Repair Program (CCTV)
- CIP 6: Sekiu LS Basin I/I Imp. (MH Repair)
- CIP 6: Sekiu LS Basin I/I Imp. (Spot Pipe Repair)
- CIP 8: Sekiu LS Basin Pipe Replacements
- CIP 9: Sekiu Airport Rd Basin Pipe Replacements
- L S CIP 17: Sekiu LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- P S Pump station
- Sewer Treatment Plant
- Parcel
- UGA Boundary

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-18
CONVEYANCE CIPS
(SEKIU LS / SEKIU AIRPORT RD BASINS)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-18 CIPs front st.mxd

N

0 275 550 1,100 Feet

LEGEND

- CIP 1: Cleanout Replacements
- CIP 1: I/I Repair Program (CCTV)
- CIP 2: Funk and Ballard Side Sewer Replacement
- CIP 2: Funk and Ballard Pipe Repairs (Side Sewer Repair)
- CIP 2: Funk and Ballard Pipe Repairs (Spot Pipe Repair)
- CIP 3: Snob Hill LS Basin I/I Impvts (Ph. I - MH Repair)
- CIP 9: Sekiu Airport Rd Basin Pipe Replacements
- CIP 10: Snob Hill LS Basin I/I and Pipe Impvt (Ph. II)
- CIP 11: West End LS Basin Pipe Replacements
- L S CIP 14: West End LS
- L S CIP 16: Snob Hill LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- Parcel
- UGA Boundary

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-19
CONVEYANCE CIPS
(SNOB HILL LS / SEKIU AIRPORT RD./ WEST END LS BASINS)

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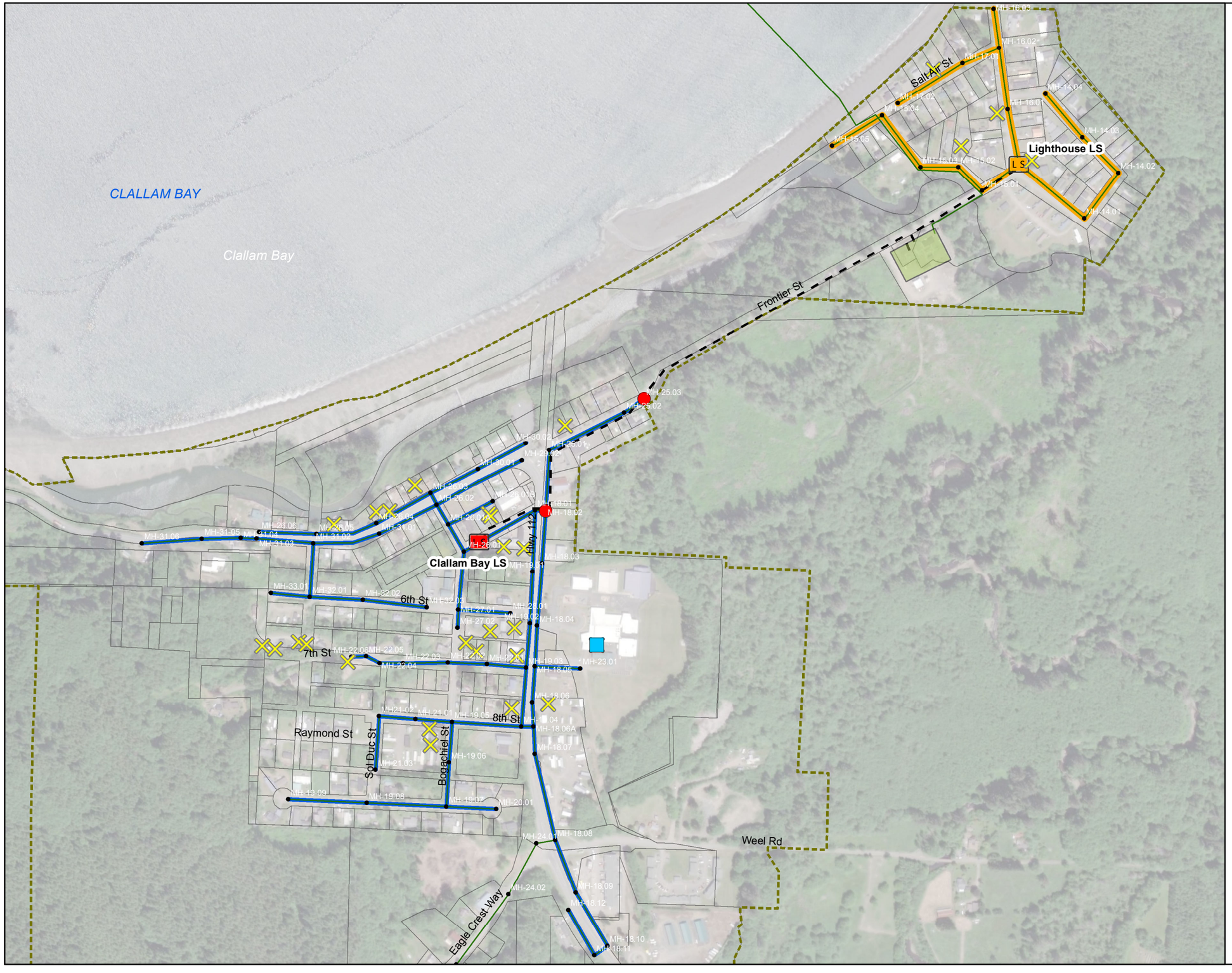
L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-19 CIPs map snob hill.mxd



LEGEND

- CIP 1: Cleanout Replacements
- CIP 3: Disconnect Area Drain
- CIP 7: Clallam Bay I/I Impvt (MH Repair)
- CIP 12: Clallam Bay LS Basin Pipe Replacements
- CIP 13: Lighthouse LS Basin Pipe Replacements
- L S — CIP 19: Clallam Bay LS
- L S — CIP 20: Lighthouse LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- P S — Pump station
- Sewer Treatment Plant
- Parcel
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 6-20
CONVEYANCE CIPS
(CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Fig 6-20 CIP clallam.mxd

Capital Improvement Plan Chapter. The costs shown reflect 2018 project costs which include construction contingencies (30%), sales tax (8.5%), engineering services (17%), construction administration (12%), and legal/county administration/permitting costs (5%).

TABLE 6-12

Collection System Improvement Projects

Project No.	Project Name	Project Description	Cost
CIP 1	I/I Repair Program	Replace 81 cleanout caps in Sekiu and Clallam Bay and provide additional CCTV for 3,475 feet in Sekiu along the Sekiu Airport Road Basin.	$152,000
CIP 2	Funk & Ballard Pipe Repairs	Repair 6-inch side sewer located north of MH 6.02 in Funk & Ballards, repair one misaligned side sewer connection west of MH 6.02, and provide a flexible coupling on disjointed PVC pipes downstream of MH 6.02.	$52,000
CIP 3	Snob Hill LS Basin I/I and Pipe Improvements (Phase I)	Replace five sewer manholes that have infiltration possibilities due to gaps in the riser rings, holes within the manhole walls or failing grout.	$134,000
CIP 4	Area Drain Disconnection	Disconnect area drain in school parking lot from the sanitary sewer and direct to a new infiltration trench west of the parking lot.	$58,000
CIP 5	Middle Point LS Basin I/I and Pipe Improvements	Includes projects resulting from the CCTV inspection including: two side sewer replacements, two manhole replacements, and two new manholes associated with 120 LF of new pipe to replace bend between MH 13.05 and MH 13.06.	$93,000
CIP 6	Sekiu LS Basin I/I Improvements	Includes projects resulting from the CCTV inspection including: three manhole replacements.	$102,000
CIP 7	Clallam Bay I/I Improvements	Includes projects resulting from field inspections including: two manhole replacements.	$84,000
CIP 8	Sekiu LS Basin Pipe Replacements	Includes replacing 3,340 LF of existing concrete pipe with PVC pipe.	$1,619,000
CIP 9	Sekiu Airport Road Basin Pipe Replacements	Includes replacing 1,340 LF of existing concrete pipe with PVC pipe.	$790,000
CIP 10	Snob Hill LS Basin I/I and Pipe Improvements (Phase II)	Includes replacing 4,745 LF 8-inch concrete pipe with 8-inch PVC pipe as well as 11 manholes.	$2,441,000
CIP 11	West End LS Basin Pipe Replacements	Includes replacing 1,580 LF of existing concrete pipe with PVC pipe.	$719,000
CIP 12	Clallam Bay LS Basin Pipe Replacements	Includes replacing 13,665 LF of existing concrete pipe with PVC pipe.	$6,072,000
CIP 13	Lighthouse LS Basin Pipe Replacements	Includes replacing 3,680 LF of existing concrete pipe with PVC pipe.	$1,685,000
Total:			**$14,001,000**

FIELD OBSERVATIONS

LIFT STATIONS

As discussed above and identified in Table 6-10, it is recommended that the capacity of the Sekiu Lift Station potentially be increased in order to accommodate the 2038 projected flows. A field survey of the County's lift stations by Gray & Osborne and County staff on May 14, 2018 revealed the following conditions and operational issues.

West End Lift Station

Facilities: Lift station located on edge of Highway 112; pumps in manhole, discharge valve vault; 4' x 3' hatch, freestanding outdoor electrical panel, generator in building.

Issues:

- Pumps are on fixed bases, not removable from surface.
- Electrical junction boxes located in wet well.
- Access lid located in low area, debris accumulated on lid
- Wetwell approximately 4-feet from road
- Discharge valve vault hatch located adjacent to retaining wall, collects debris.
- Discharge valve vault has standing water.
- Discharge valve vault does not have access ladder.
- Piping and valves not painted.
- Bypass connection located in adjacent, small, flooded metering vault.
- Air-release valve located in adjacent, small metering vault.

Snob Hill Lift Station

Facilities: Lift station located approximately 25-feet off edge of Highway 112; wet well is manhole with flat lid at grade, freestanding outdoor electrical panel, generator in building. Wet pit/dry pit pump station arrangement with pumps in manhole as dry pit.

Issues:

- Dry pit located below grade.
- Pump 1 has mechanical problems.
- Wastewater flow path from upstream manholes may be susceptible to sedimentation.

Middle Point Lift Station

Facilities: Lift station located approximately 15-feet off edge of Highway 112; submersible pumps in manhole with lid at grade, freestanding outdoor electrical panel, generator in building.

Issues:

- Pumps are on fixed bases, not removable from surface.
- Electrical junction boxes located in wet well.
- Wastewater flow path from upstream manholes may be susceptible to sedimentation.
- Discharge check and isolation valves located in wet well.

Sekiu Lift Station

Facilities: Lift station located within the Sekiu WWTP site; pumps in manhole with partially buried oversize lid at grade, freestanding outdoor electrical panel, standby power is from WWTP.

Issues:

- Pumps are on fixed bases, not removable from surface.
- Electrical junction boxes located in wet well.
- Discharge check and isolation valves located in wet well.

Clallam Bay Station

Facilities: Lift station located at intersection of 5th Street and Bogachiel Street; wet well is manhole with lid at grade in roadway, freestanding outdoor electrical panel, generator in building. Wet pit/dry pit pump station arrangement with pumps in manhole as dry pit.

Issues:

- Dry pit located below grade.
- Electrical junction boxes located in wet well.

Lighthouse Lift Station

Facilities: Lift station control panels located approximately 15-feet off edge of Frontier Street; submersible pumps in manhole with lid at grade in intersection of Frontier Street and Salmon Street, freestanding outdoor electrical panel, standby power from Clallam Bay WWTP.

Issues:

- Pumps are on fixed bases, not removable from surface.
- Electrical junction boxes located in wet well.
- Discharge check and isolation valves located in wet well.

Olson Lift Station

Facilities: Lift station located off of Washington Street; wet well is manhole with lid at grade, freestanding outdoor electrical panel, generator in building.

Issues:

- Pumps are on fixed bases, not removable from surface.
- Discharge check and isolation valves located in wet well.
- Electrical junction boxes located in wet well.

Although all lift stations are currently operable, all of the control panels need to be replaced with new panels and furnished with telemetry. All submersible pumps need to be replaced with pumps that are removable from surface. All check and isolation valves need to be replaced and located in accessible well-drained vaults at grade. It is recommended that the wet wells are rehabilitated with sandblasting and grouting of old penetrations. It is recommended that the wet pit/dry pit lift stations are converted to submersible type pump stations with new pumps and check and isolation valves located in new valve vaults.

Table 6-13 presents a summary of the recommended pump station improvements in order of replacement priority. Similar to the conveyance projects, the costs shown reflect 2018 project costs which include construction contingencies (30%), sales tax (8.5%), engineering services (17%), construction administration (12%), and legal/county administration/permitting costs (5%). The locations of these stations are also shown in Figures 6-17 through Figure 6-20.

TABLE 6-13

Lift Station Improvement Projects

Project No.	Project Name	Project Description	Cost
CIP 14	West End LS	New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well.	$947,000
CIP 15	Middle Point LS	New control panels with telemetry, new removable submersible pumps on rails, new piping & valves in new valve vault, and rehabilitate wet well.	$903,000
CIP 16	Snob Hill LS	New control panels with telemetry, convert station to submersible type with new removable submersible pumps on rails, new valve vault with new piping and valves.	$1,009,000
CIP 17	Sekiu LS	New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well.	$880,000
CIP 18	Olson LS	New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well.	$881,000
CIP 19	Clallam Bay LS	New control panels with telemetry, convert station to submersible type with new removable submersible pumps on rails, new valve vault with new piping and valves.	$960,000
CIP 20	Lighthouse LS	New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well.	$1,018,000
Total:			**$6,598,000**

CHAPTER 7

WASTEWATER TREATMENT FACILITY EVALUATION

This chapter provides an evaluation of the ability of the existing WWTPs to meet treatment objectives at the projected future influent flows and loadings and an evaluation of WWTP improvement alternatives. This chapter also includes an evaluation of combining the flows from the two communities and treating the combined flows at a single WWTP. The projected WWTP influent flows and loading were established in Chapter 5 and are summarized in Table 7-1 and Table 7-2 below.

TABLE 7-1

WWTP Influent Design Criteria for Clallam Bay WWTP

Parameter	NPDES Permit	2018 Value	Projected 2028 Value	Projected 2038 Value	Projected 2038 Value w/25% I/I Reduction
Average Annual Flow, AAF (mgd)	--	0.034	0.037	0.039	0.037
Maximum Month Flow, MMF (mgd)	0.12	0.063	0.065	0.068	0.058
Peak Day Flow, PDF (mgd)	--	0.145	0.147	0.150	0.120
Peak Hour Flow, PHF (mgd)(1)	--	0.388	0.422	0.444	0.306
Average Annual BOD_5 Loading (lb/d)	--	50	55	61	--
Maximum Month BOD_5 Loading (lb/d)	135	73	81	89	--
Average Annual TSS Loading (lb/d)	--	44	49	54	--
Maximum Month TSS Loading (lb/d)	171	78	87	96	--

(1) Current peak hour flow to annual average flow ratio used to project future PHF.

TABLE 7-2

WWTP Influent Design Criteria for Sekiu WWTP

Parameter	NPDES Value	2018 Value	Projected 2028 Value	Projected 2038 Value	Projected 2038 Value w/25% I/I Reduction
Average Annual Flow, AAF (mgd)	--	0.067	0.070	0.072	0.061
Maximum Month Flow, MMF (mgd)	0.145	0.156	0.158	0.161	0.128
Peak Day Flow, PDF (mgd)	--	0.619	0.621	0.624	0.500
Peak Hour Flow, PHF (mgd)(1)	--	1.40	1.46	1.50	1.062
Average Annual BOD_5 Loading (lb/d)	--	61	67	74	--
Maximum Month BOD_5 Loading (lb/d)	135	162	179	197	--
Average Annual TSS Loading (lb/d)	--	39	43	47	--
Maximum Month TSS Loading (lb/d)	171	120	133	147	--

(1) Current peak hour flow to annual average flow ratio used to project future PHF.

The effluent permit requirements for the Clallam Bay and Sekiu WWTPs were provided in Tables 4-3 and are repeated in Table 7-3.

TABLE 7-3

WWTP NPDES Effluent Permit Limits

Parameter	Sekiu WWTP	Clallam Bay WWTP
BOD_5 Concentration (mo. Avg.)	30 mg/L	30 mg/L
BOD_5 Concentration (wk. avg.)	45 mg/L	45 mg/L
BOD_5 Load (mo. Avg.)	20 lbs/day	20 lbs/day
BOD_5 Load (wk. avg.)	30 lbs/day	30 lbs/day
BOD_5 Percent Removal	≥ 85% of Influent	≥ 85% of Influent
TSS Concentration (mo. Avg.)	30 mg/L	30 mg/L
TSS Concentration (wk. avg.)	45 mg/L	45 mg/L
TSS Load (mo. Avg.)	26 lbs/day	26 lbs/day
TSS Load (wk. avg.)	39 lbs/day	39 lbs/day
TSS Percent Removal	≥ 85% of Influent	≥ 85% of Influent
Fecal Coliform County (mo. avg.)	200/100 mL	200/100 mL
Fecal Coliform County (wk. avg.)	400/100 mL	400/100 mL
pH	6 ≤ pH ≤9.0	6 ≤ pH ≤9.0

This evaluation focuses on the following WWTP, outfall and biosolids management issues, at current and future design loadings:

- Liquid and Solids Stream Treatment
    - Capacity to treat projected WWTP flows and loadings.
    - Compliance with permit limits.
    - Standby power considerations.
    - WWTP reliability and redundancy.
- Outfall Capacity
- Biosolids Management

HISTORICAL PLANT PERFORMANCE

Historical plant flows were summarized in Table 5-1 and 5-2. Historical plant loadings were summarized in Tables 5-5 and 5-6. Tables 5-3 and 5-4 provide a summary of the discharge monitoring reports and note NPDES permit exceedances for the Clallam Bay and Sekiu WWTPs, respectively, for the 5-year period from 2013 through 2017. A summary of the NPDES permit exceedances are provided in Table 7-4 below.

TABLE 7-4

Summary of NPDES Permit Exceedances from 2013 to 2017

Date	Permit Exceedance	Note
Clallam Bay WWTP		
Mar 2013	81% TSS Removal	Below permit minimum
Mar 2014	84% TSS Removal	Below permit minimum
May 2015	Eff. pH 5.9	Below permit minimum
Jan 2016	Eff. pH 5.9	Below permit minimum
Mar 2016	Eff. pH 5.9	Below permit minimum
Nov 2016	Eff. pH 5.8	Below permit minimum
Feb 2017	Eff. pH 5.9	Below permit minimum
Mar 2017	Eff. pH 5.9	Below permit minimum
Nov 2017	Eff. pH 5.9	Below permit minimum
Dec 2017	Eff. pH 5.9	Below permit minimum
Sekiu WWTP		
Mar 2013	82% TSS Removal	Below permit minimum
Feb 2014	83% BOD Removal	Below permit minimum
Feb 2014	81% TSS Removal	Below permit minimum
May 2014	Eff. pH 5.8	Below permit minimum
Sep 2014	162 lb/d Max Mo Infl. BOD	Above permit maximum
Oct 2014	84% TSS Removal	Below permit minimum
Dec 2014	Eff. pH 5.8	Below permit minimum
May 2015	Eff. pH 5.9	Below permit minimum
Jul 2015	154 lb/d Max. Mo. Infl. BOD	Above permit maximum
Nov 2015	84% BOD Removal	Below permit minimum
Dec 2015	0.156 mgd Infl.	Above permit maximum
Dec 2015	83% TSS Removal	Below permit minimum
Dec 2016	79% BOD Removal	Below permit minimum
Dec 2016	82% TSS Removal	Below permit minimum
Nov 2017	80% TSS Removal	Below permit minimum

Note: The pH violations are due to a lack of alkalinity in the influent. Under all alternatives, a new sodium hydroxide feed system would be installed to ensure pH compliance. In addition, some of the alternatives (e.g., conventional activated sludge) can be operated to recover alkalinity.

CLALLAM BAY WWTP

BOD_5 and TSS Effluent Concentrations and Percent Removal

Monthly average and maximum weekly effluent BOD_5 and TSS concentrations for the period of 2013 through 2017 for Clallam Bay WWTP were presented in Table 5-3, and are shown graphically in Figures 7-1 and 7-2, respectively. The percent removal of BOD and TSS are shown in Figure 7-3.

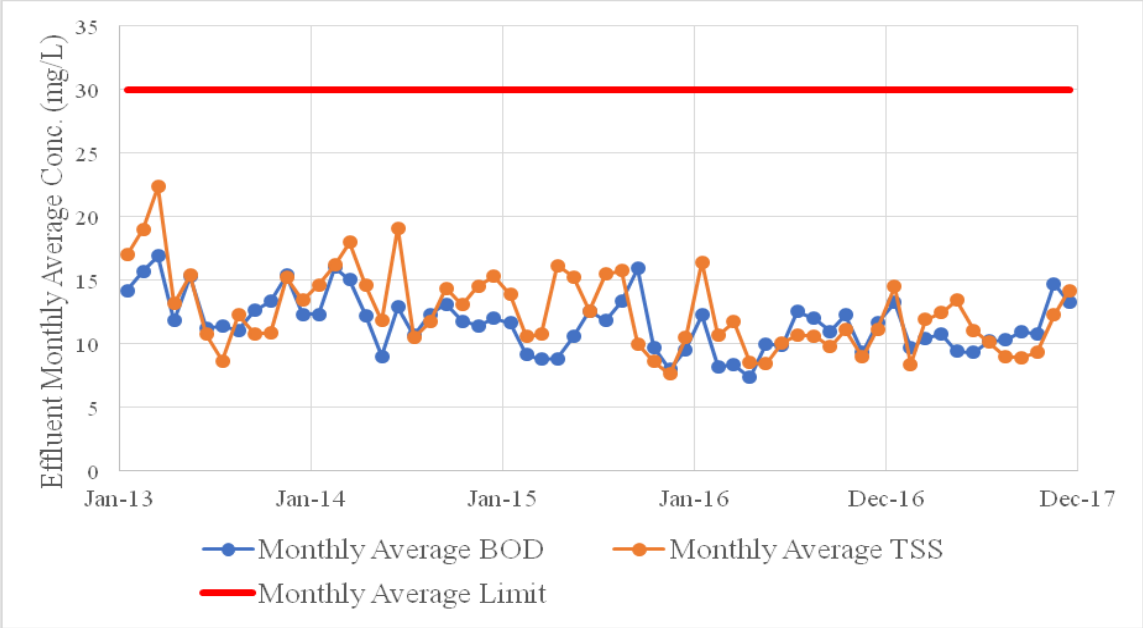


FIGURE 7-1

Clallam Bay Monthly Average Effluent BOD and TSS Concentration (mg/L)

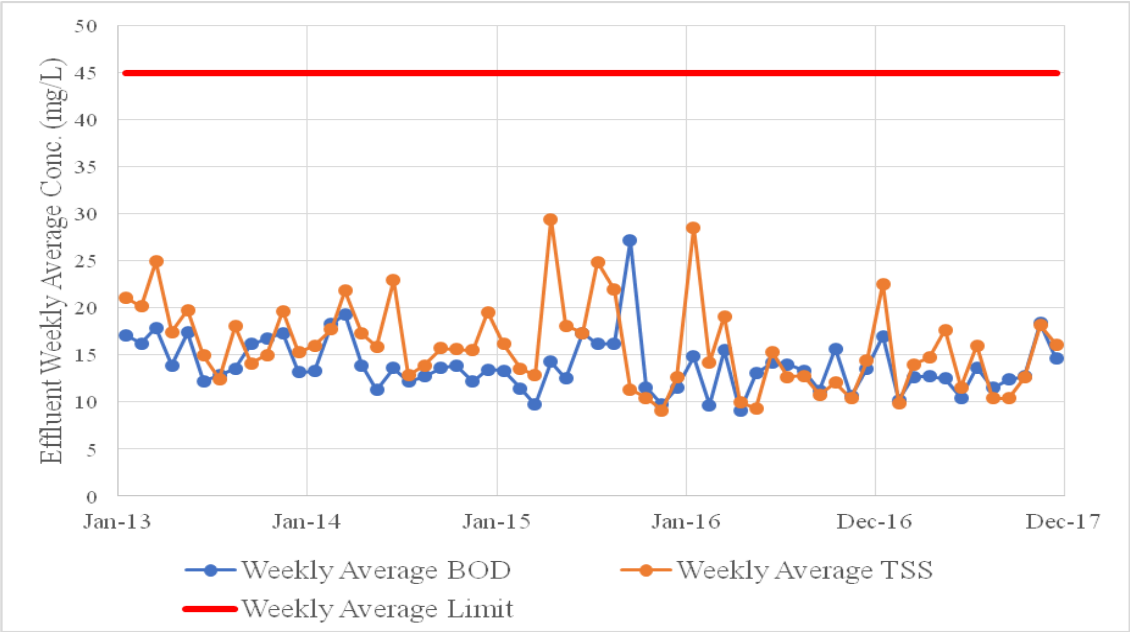


FIGURE 7-2

Clallam Bay Maximum Weekly Effluent BOD and TSS Concentration (mg/L)

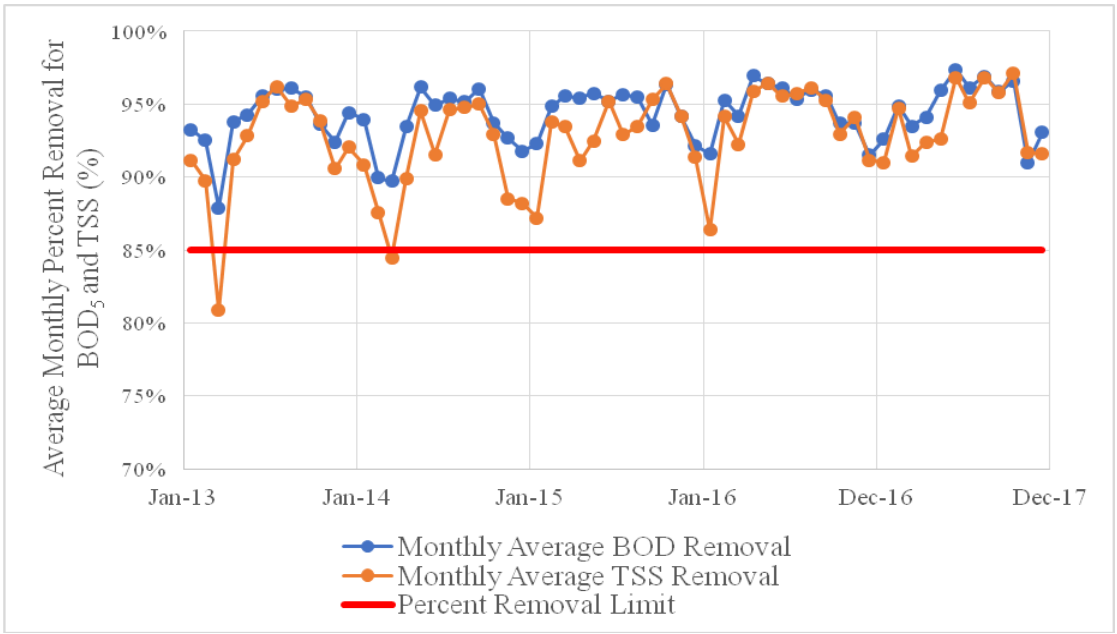


FIGURE 7-3

Clallam Bay Monthly Average BOD and TSS % Removal (%)

There are two instances where monthly average TSS removal percentages dropped below the 85 percent removal permit limit, as shown in Figure 7-3. These exceedances are most likely due to dilute influent TSS concentrations during high wintertime flows, which make it difficult to achieve the minimum percent removal.

Effluent Fecal Coliform Count

Maximum weekly and average monthly effluent fecal coliform count discharged by the Clallam Bay WWTP for the period of 2013 through 2017 were shown in Table 5-3, and are presented in Figures 7-4 and 7-5, respectively. There were no exceedances for the monthly or weekly average fecal coliform count.

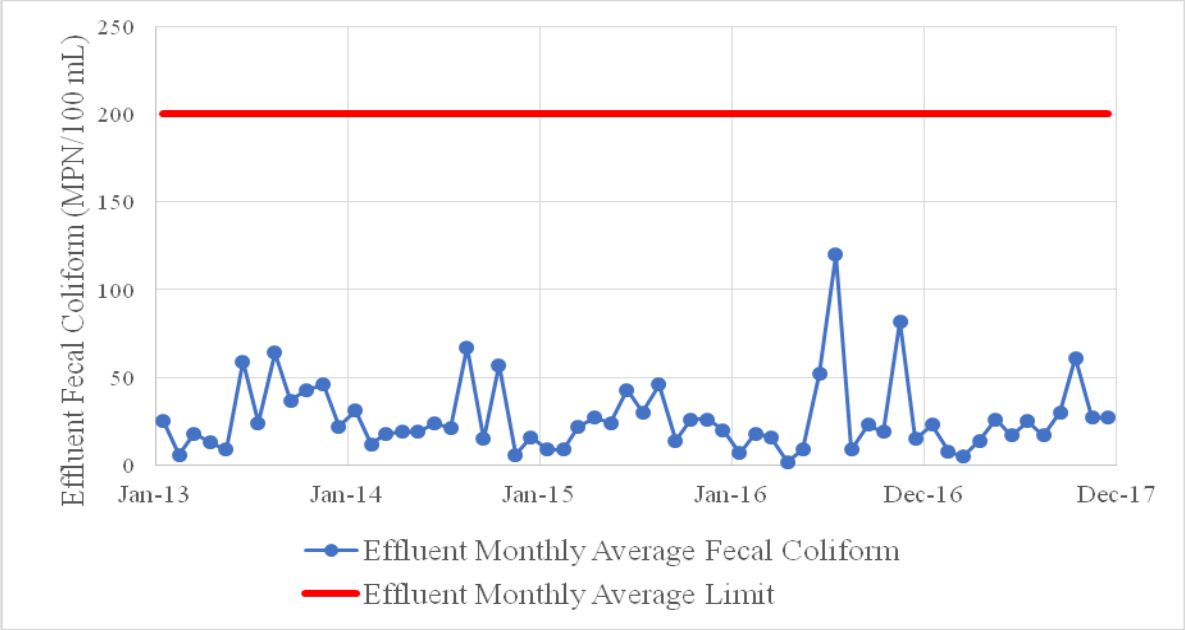


FIGURE 7-4

Clallam Bay Monthly Average Fecal Coliform (MPN/100 mL)

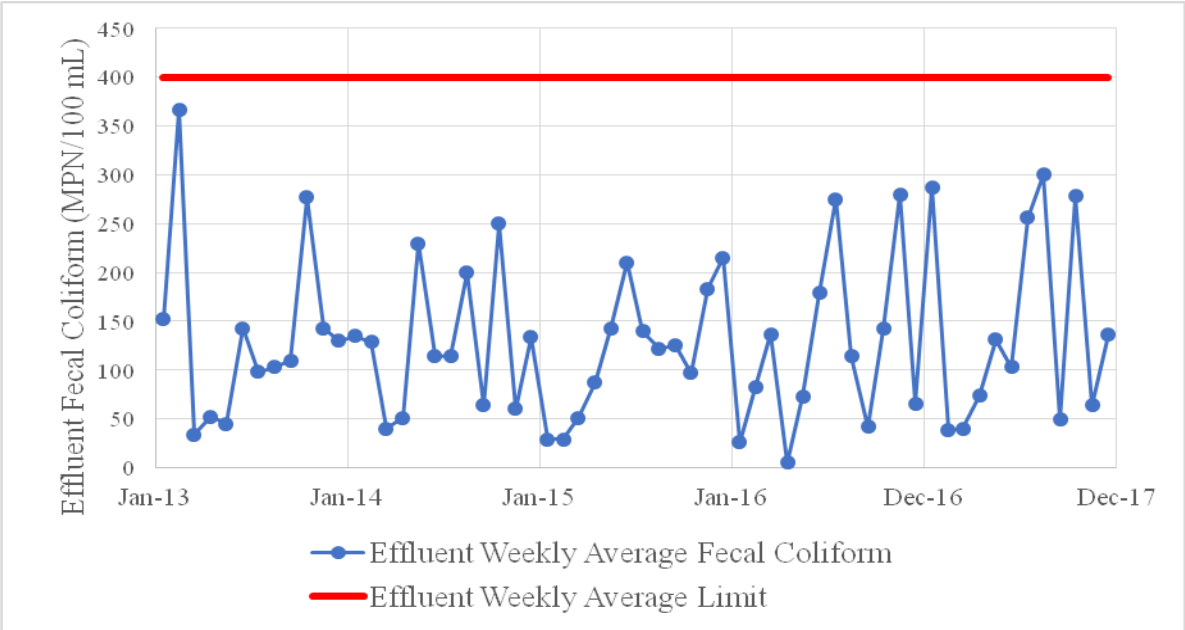


FIGURE 7-5

Clallam Bay Maximum Weekly Fecal Coliform (MPN/100 mL)

SEKIU WWTP

BOD_5 and TSS Effluent Concentrations and Percent Removal

Monthly average and maximum weekly average effluent BOD_5 and TSS concentrations for the period of 2013 through 2017 for Sekiu WWTP were presented in Table 5-4, and are shown graphically in Figures 7-6 and 7-7, respectively. The percent removal of BOD and TSS are shown in Figure 7-3.

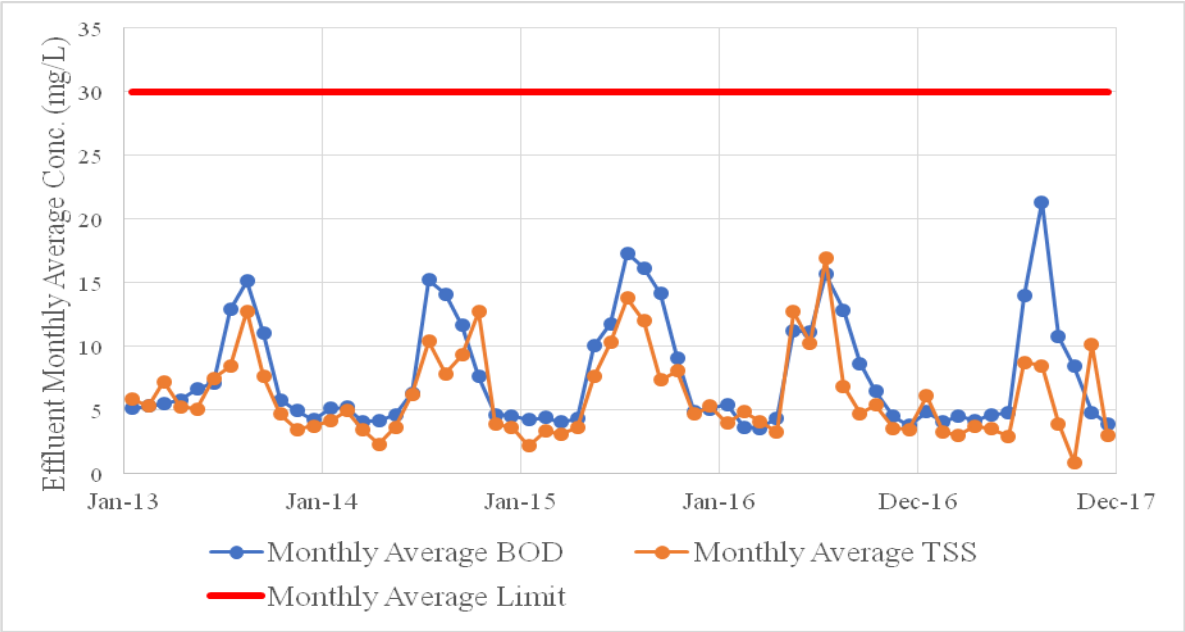


FIGURE 7-6

Sekiu Monthly Average Effluent BOD and TSS Concentration (mg/L)

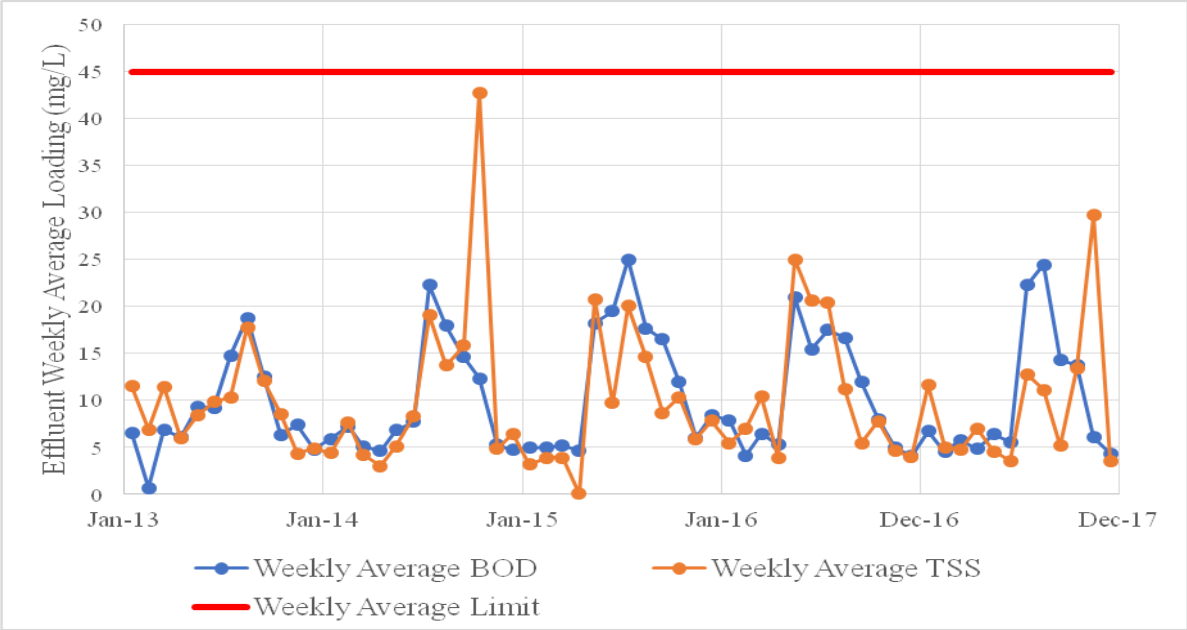


FIGURE 7-7

Sekiu Maximum Weekly Effluent BOD and TSS Concentration (mg/L)

There have been no exceedances for average monthly and weekly effluent BOD_5 and TSS concentration, and the averages for the study period are well below the limits for the Sekiu WWTP.

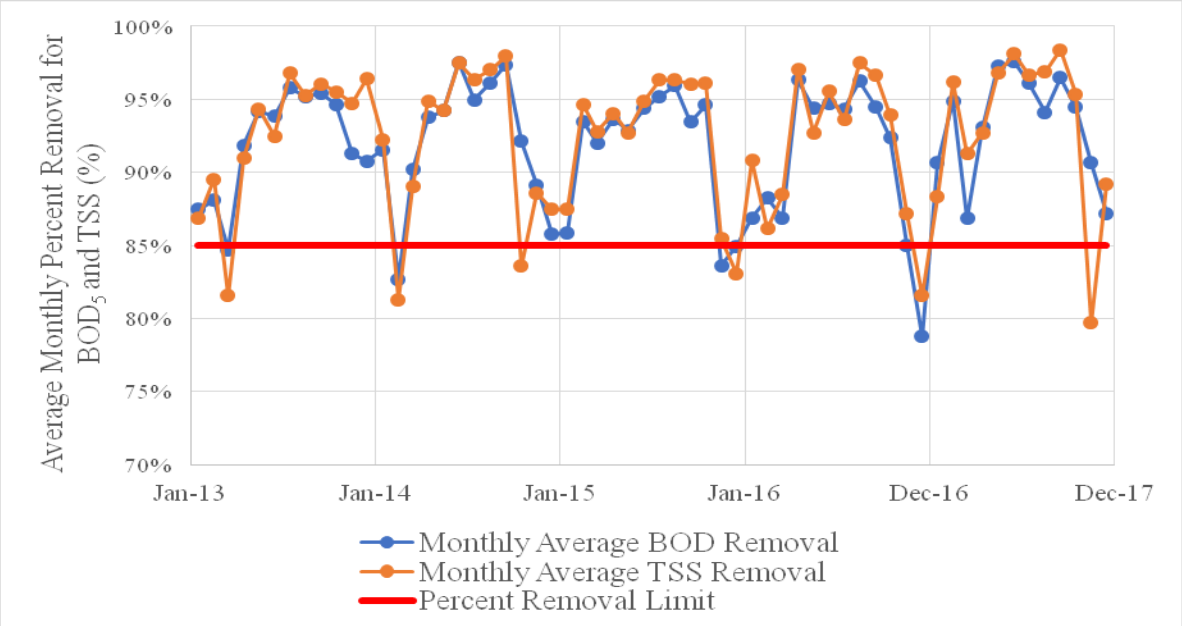


FIGURE 7-8

Sekiu Average Monthly BOD and TSS Removal (%)

There are six instances for TSS removal and five instances for BOD removal where monthly average removal percentages drop below the 85 percent loading removal permit limits at the Sekiu WWTP, as shown in Figure 7-8. These exceedances are most likely due to dilute influent BOD and TSS concentrations during high wintertime flows which make it difficult to achieve the minimum percent removal.

Effluent Fecal Coliform Count

Average weekly and monthly effluent fecal coliform count discharged by the Sekiu WWTP for the period of 2013 through 2017 were shown in Table 5-4, and are presented in Figures 7-9 and 7-10, respectively. There were no exceedances for the monthly or weekly average fecal coliform count.

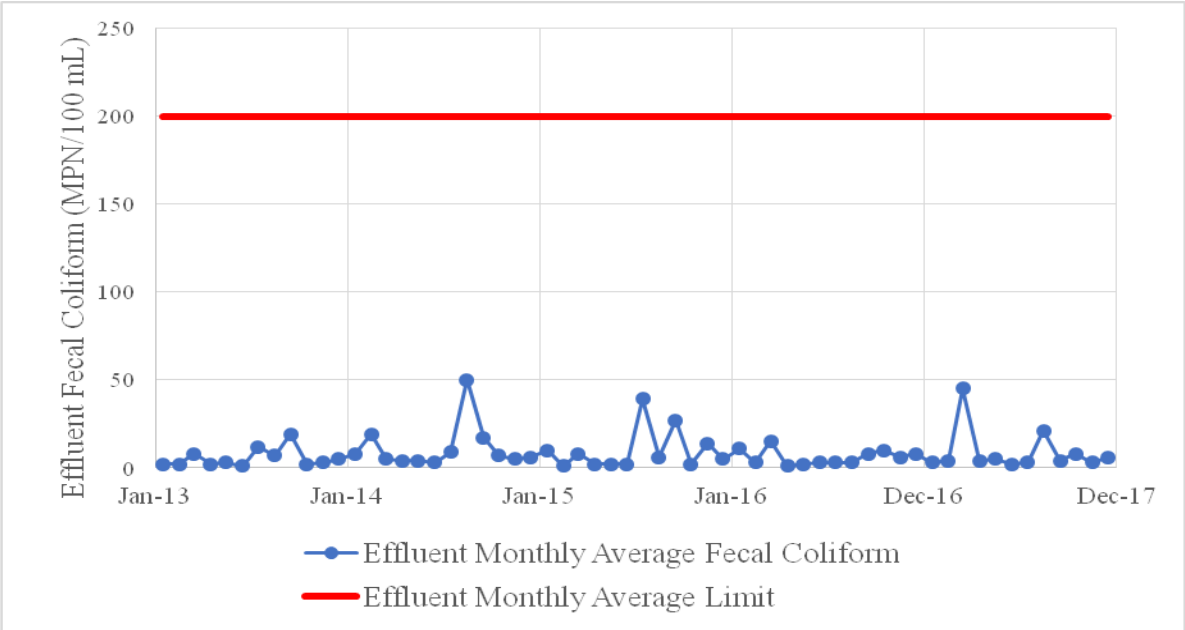


FIGURE 7-9

Sekiu Monthly Average Fecal Coliform (MPN/100 mL)

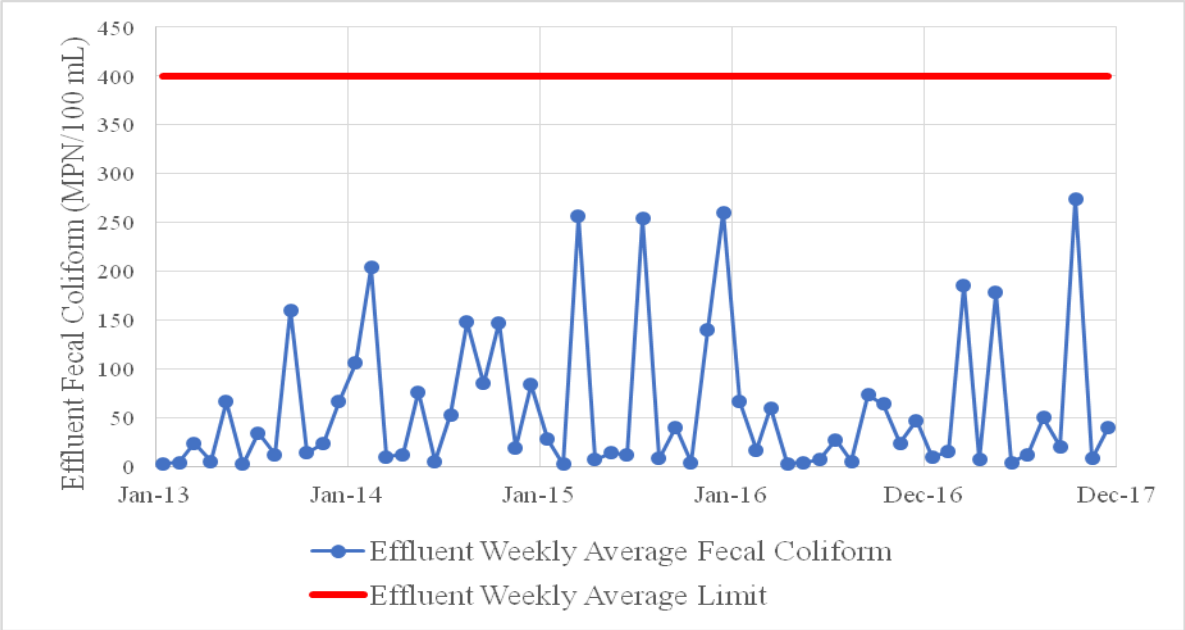


FIGURE 7-10

Sekiu Maximum Weekly Fecal Coliform (MPN/100 mL)

FACILITY EVALUATION AT PROJECTED DESIGN CRITERIA

This section summarizes an evaluation of the capacities of the major WWTP components at 2028 and 2038 projected flows and loadings, and where applicable, compares them to accepted design criteria, such as those published in the Ecology's *Criteria for Sewage Works Design (Orange Book, 2008),* WEF *Design of Wastewater Treatment Plants*, Manual of Practice No. 8 (2010) and *Wastewater Engineering* (Metcalf and Eddy, 2014). This evaluation is summarized in Table 7-5 and Table 7-6, which provides the operating conditions with all units in service.

TABLE 7-5

Comparison of Component Design Criteria and Projected Flows and Loadings – Clallam Bay WWTP

Component (Parameter)	Capacity/Criteria	Reference	2028 Operating Condition (Meets Criteria?)	2038 Operating Condition (Meets Criteria?)	2028 Operating Condition w/25% I/I Reduction (Meets Criteria?)	2038 Operating Condition w/25% I/I Reduction (Meets Criteria?)
Influent Flow Metering	Measure Influent Flow	Ecology, 2008	No	No	No	No
Influent Fine Screen	3/8-in max opening	WAC 173-308-205	1/2-in (No)	1/2-in (No)	1/2-in (No)	1/2-in (No)
Influent Coarse Screen	3/8-in max opening	WAC 173-308-205	1/2-in (No)	1/2-in (No)	1/2-in (No)	1/2-in (No)
Grit Chamber (PHF)	1.0 mgd	Engineering Report, CWC	0.422 (Yes)	0.444 (Yes)	0.303 (Yes)	0.306 (Yes)
Primary Clarifier (Redundancy)	Alternate unit serves 50% of the PHF with primary unit out of service	EPA-430-99-74-001, Reliability Criteria	No[(1)]	No[(1)]	No[(1)]	No[(1)]
Primary Clarifier (Surface Overflow Rate at MMF)	≤ (800 to 1,200) gpd/sf	Ecology, 2008	256 gpd/sf (Yes)	267 gpd/sf (Yes)	220 gpd/sf (Yes)	228 gpd/sf (Yes)
(Surface Overflow Rate at PHF)	≤ (2 ,000 to 3,000) gpd/sf	Ecology, 2008	1,659 gpd/sf (Yes)	1,746 gpd/sf (Yes)	1,191 gpd/sf (Yes)	1,203 gpd/sf (Yes)
Primary Clarifier (Detention Time at AAF)	≥ (1.5 to 2.5) hr	Metcalf & Eddy, 2014	11.1 hours (Yes)	10.5 hours (Yes)	12.1 hours (Yes)	11.1 hours (Yes)
Rotating Biological Contactors (Redundancy)	Alternate unit serves 75% of the PHF with primary unit out of service	EPA-430-99-74-001, Reliability Criteria	Yes	Yes	Yes	Yes

TABLE 7-5 – (continued)

Comparison of Component Design Criteria and Projected Flows and Loadings – Clallam Bay WWTP

Component (Parameter)	Capacity/Criteria	Reference	2028 Operating Condition (Meets Criteria?)	2038 Operating Condition (Meets Criteria?)	2028 Operating Condition w/25% I/I Reduction (Meets Criteria?)	2038 Operating Condition w/25% I/I Reduction (Meets Criteria?)
Rotating Biological Contactors (Hydraulic Loading at MMF)	(1.96 to 3.93) gal/ft^2-d	Metcalf & Eddy, 2014	1.3 gal/ft^2-d (Yes)	1.36 gal/ft^2-d (Yes)	1.12 gal/ft^2-d (Yes)	1.16 gal/ft^2-d (Yes)
Rotating Biological Contactors (Maximum 1st Stage Organic Loading at MMF)	≤ 6.4 lb BOD/d/1,000 ft^2	WEF, 2010	4.05 lb BOD/d/1,000 ft^2 (Yes)	4.45 lb BOD/d/1,000 ft^2 (Yes)	4.05 lb BOD/d/1,000 ft^2 (Yes)	4.45 lb BOD/d/1,000 ft^2 (Yes)
Rotating Biological Contactors (Hydraulic Retention Time at MMF)	≥(0.7 to 1.5) hrs	Metcalf & Eddy, 2014	1.64 hours (Yes)	1.57 hours (Yes)	1.90 hours (Yes)	1.84 hours (Yes)
Secondary Clarifier (Redundancy)	Alternate unit serves 50% of the PHF with primary unit out of service	EPA-430-99-74-001, Reliability Criteria	No	No	No	No
Secondary Clarifier (Surface Overflow Rate at MMF) (Surface Overflow Rate at PHF)	≤ (400 to 700) gpd/sf ≤ (300 to 1,000) gpd/sf ≤ (1,000 to 1,200) gpd/sf	Ecology, 2008 WEF, 2010WEF, 2010 WEF, 2010	255 gpd/sf (Yes) 255 gpd/sf (Yes) 1,658 gpd/sf (No)	267 gpd/sf (Yes) 267 gpd/sf (Yes) 1,745 gpd/sf (No)	220 gpd/sf (Yes) 220 gpd/sf (Yes) 1,191 gpd/sf (No, due to shallow SWD)	228 gpd/sf (Yes) 228 gpd/sf (Yes) 1,203 gpd/sf (No)

TABLE 7-5 – (continued)

Comparison of Component Design Criteria and Projected Flows and Loadings – Clallam Bay WWTP

Component (Parameter)	Capacity/Criteria	Reference	2028 Operating Condition (Meets Criteria?)	2038 Operating Condition (Meets Criteria?)	2028 Operating Condition w/25% I/I Reduction (Meets Criteria?)	2038 Operating Condition w/25% I/I Reduction (Meets Criteria?)
Secondary Clarifier (Solids Loading Rate at MMF)	≤ (19.2 to 28.8) lb/sf-d ≤ (20 to 30) lb/sf-d	Metcalf & Eddy, 2014 WEF, 2010	4.0 lb/sf-d (Yes) 4.0 lb/sf-d (Yes)	4.2 lb/sf-d (Yes) 4.2 lb/sf-d (Yes)	3.52 lb/sf-d (Yes) 3.52 lb/sf-d (Yes)	3.63 lb/sf-d (Yes) 3.63 lb/sf-d (Yes)
(Solids Loading Rate at PHF)	≤ 48 lb/sf-d ≤ 50 lb/sf-d	Metcalf & Eddy, 2014 WEF, 2010	26.0 lb/sf-d (Yes) 26.0 lb/sf-d (Yes)	27.2 lb/sf-d (Yes) 27.2 lb/sf-d (Yes)	18.9 lb/sf-d (Yes) 18.9 lb/sf-d (Yes)	19.1 lb/sf-d (Yes) 19.1 lb/sf-d (Yes)
UV Disinfection System (Capacity)[1] – PDF	0.07 mgd @ 50% UVT with one bank[(2)]	Manufacturer's Representative	0.147 mgd (No)	0.150 mgd (No)	0.117 mgd (No)	0.120 mgd (No)
UV Disinfection System (Capacity) – MMF	0.07 mgd @ 50% UVT with one bank at MMF	Manufacturer's Representative	0.065 mgd (Yes)	0.068 mgd (Yes)	≤0.065 mgd (Yes)	≤0.068 mgd (Yes)

(1) See discussion below. Single primary clarifier may be acceptable based on loading and with provisions for a bypass pipe.
(2) Typically, design for PDF allows for two banks in service; however, the existing system does not automatically call the second bank during high flows.

TABLE 7-6

Comparison of Component Design Criteria and Projected Flows and Loadings – Sekiu WWTP

Component (Parameter)	Capacity/Criteria	Reference	2028 Operating Condition (Meets Criteria?)	2038 Operating Condition (Meets Criteria?)	2028 Operating Condition w/25% I/I Reduction (Meets Criteria?)	2038 Operating Condition w/25% I/I Reduction (Meets Criteria?)
Influent Flow Metering	Measure Influent Flow	Ecology, 2008	No	No	No	No
Influent Fine Screen	3/8-in max opening	WAC 173-308-205	1/2-in (No)	1/2-in (No)	1/2-in (No)	1/2-in (No)
Influent Coarse Screen	3/8-in max opening	WAC 173-308-205	1/2-in (No)	1/2-in (No)	1/2-in (No)	1/2-in (No)
Grit Chamber (PHF)	1.0 mgd	Engineering Report, CWC	1.46 (No)	1.5 (No)	1.060 (No)	1.062 (No)
Primary Clarifier (Redundancy)	Alternate unit serves 50% of the PHF with primary unit out of service	EPA-430-99-74-001, Reliability Criteria	No [(1)]	No [(1)]	No [(1)]	No [(1)]
Primary Clarifier (Surface Overflow Rate at MMF)	≤ (800 to 1,200) gpd/sf	Ecology, 2008	416 gpd/sf (Yes)	424 gpd/sf (Yes)	329 gpd/sf (Yes)	337 gpd/sf (Yes)
(Surface Overflow Rate at PHF)	≤ (2,000 to 3,000) gpd/sf	Ecology, 2008	3,843 gpd/sf (No)	3,948 gpd/sf (No)	2,790 gpd/sf (Yes)	2,795 gpd/sf (Yes)
Primary Clarifier (Detention Time at AAF)	1.5 to 2.5 hr	Metcalf & Eddy, 2014	5.9 hours (Yes)	5.7 hours (Yes)	7.0 hours (Yes)	6.7 hours (Yes)
Rotating Biological Contactors (Redundancy)	Alternate unit serves 75% of the PHF with primary unit out of service	EPA-430-99-74-001, Reliability Criteria	Yes	Yes	Yes	Yes
Rotating Biological Contactors (Hydraulic Loading at MMF)	≤ (1.96 to 3.93) gal/ft^2/d	Metcalf & Eddy, 2014	0.958 gal/ft^2-d (Yes)	0.976 gal/ft^2-d (Yes)	0.758 gal/ft^2-d (Yes)	0.776 gal/ft^2-d (Yes)

TABLE 7-6 – (continued)

Comparison of Component Design Criteria and Projected Flows and Loadings – Sekiu WWTP

Component (Parameter)	Capacity/Criteria	Reference	2028 Operating Condition (Meets Criteria?)	2038 Operating Condition (Meets Criteria?)	2028 Operating Condition w/25% I/I Reduction (Meets Criteria?)	2038 Operating Condition w/25% I/I Reduction (Meets Criteria?)
Rotating Biological Contactors (Maximum 1st Stage Organic Loading at MMF)	≤ 6.4 lb BOD/d/1,000 ft^2	WEF, 2010	2.71 lb BOD/d/1,000 ft^2 (Yes)	2.98 lb BOD/d/1,000 ft^2 (Yes)	2.71 lb BOD/d/1,000 ft^2 (Yes)	2.98 lb BOD/d/1,000 ft^2 (Yes)
Rotating Biological Contactors (Hydraulic Retention Time at MMF)	≥ (0.7 to 1.5) hrs	Metcalf & Eddy, 2014	1.01 hours (Yes)	0.99 hours (Yes)	1.27 hours (Yes)	1.24 hours (Yes)
Secondary Clarifier (Redundancy)	Alternate unit serves 50% of the PHF with primary unit out of service	EPA-430-99-74-001, Reliability Criteria	No	No	No	No
Secondary Clarifier (Surface Overflow Rate at MMF)	≤ (400 to 700) gpd/sf	Ecology, 2008	416 gpd/sf (Yes)	424 gpd/sf (Yes)	329 gpd/sf (Yes)	337 gpd/sf (Yes)
	≤ (300 to 1,000) gpd/sf	WEF, 2010	416 gpd/sf (Yes)	424 gpd/sf (Yes)	329 gpd/sf (Yes)	337 gpd/sf (Yes)
(Surface Overflow Rate at PHF)	≤ (1,000 to 1,200) gpd/sf	WEF, 2010	3,841 gpd/sf (No)	3,946 gpd/sf (No)	2,788 gpd/sf (No)	2,794 gpd/sf (No)
Secondary Clarifier (Solids Loading Rate at MMF)	≤ (19.2 to 28.8) lb/sf-d	Metcalf & Eddy, 2014 WEF, 2010	9.64 lb/sf-d (Yes)	9.82 lb/sf-d (Yes)	7.69 lb/sf-d (Yes)	7.87 lb/sf-d (Yes)
	≤ (20 to 30) lb/sf-d		9.64 lb/sf-d (Yes)	9.82 lb/sf-d (Yes)	7.69 lb/sf-d (Yes)	7.87 lb/sf-d (Yes)
(Solids Loading Rate at PHF)	≤ 48 lb/sf-d	Metcalf & Eddy, 2014 WEF, 2010	87.7 lb/sf-d (No)	90.1 lb/sf-d (No)	64.1 lb/sf-d (No)	64.2 lb/sf-d (No)
	≤ 50 lb/sf-d		87.7 lb/sf-d (No)	90.1 lb/sf-d (No)	64.1 lb/sf-d (No)	64.2 lb/sf-d (No)
UV Disinfection System (Capacity(2) -PDF	0.07 mgd @ 50% UVT with two banks	Manufacturer's Representative	0.521mgd (No)	0.524 mgd (No)	0.397 mgd (No)	0.4 mgd (No)

TABLE 7-6 – (continued)

Comparison of Component Design Criteria and Projected Flows and Loadings – Sekiu WWTP

Component (Parameter)	Capacity/Criteria	Reference	2028 Operating Condition (Meets Criteria?)	2038 Operating Condition (Meets Criteria?)	2028 Operating Condition w/25% I/I Reduction (Meets Criteria?)	2038 Operating Condition w/25% I/I Reduction (Meets Criteria?)
UV Disinfection System (Capacity)-MMF	0.07 mgd @ 50% UVT with one bank	Manufacturer's Representative	0.158 mgd (No)	0.161 mgd (No)	.125 mgd (No)	0.128 mgd (No)

(1) See discussion below. Single primary clarifier may be acceptable based on loading and with provisions for a bypass pipe.
(2) Typically, design for PDF allows for two banks in service; however, the existing system does not automatically call the second bank during high flows.

HEADWORKS

Influent Screening and Grit Removal

At both the Clallam Bay and Sekiu WWTPs, the existing influent screening system consists of two manually cleaned bar racks in series. The first bar rack has 1-5/8-inch openings and the second bar rack has 1/2-inch openings. These screens do not meet the minimum required criteria of 3/8-inch maximum opening according to WAC 173-308-205.

The grit removal channel at the Clallam Bay WWTP provides satisfactory performance and is capable of adequately treating the projected 2038 flow. The physical condition of the grit removal channel is currently serviceable and is expected to remain in serviceable condition for the 20-year design period.

The grit removal channel at the Sekiu WWTP is not capable of adequately treating the current peak hour flows. The physical condition of the grit removal channel is currently serviceable and is expected to remain in serviceable condition for the 20-year design period.

Influent Flow Meter

Neither WWTP measures influent flow. The requirement for influent flow monitoring is included in the Criteria for Sewage Works Design (Ecology, 2008).

PRIMARY CLARIFIERS

The WWTPs each have one primary clarifier. Both primary clarifiers have 9-foot side water depth (SWD) which is on the shallow end of typical clarifier depth design criteria and thus poorer performance would be expected than with a typical clarifier with the same diameter. The primary clarifier at the Clallam Bay WWTP has an 18-foot diameter and the primary clarifier at the Sekiu WWTP has a 22-foot diameter. They are both peripheral feed clarifiers with center withdrawal, which is opposite of current best practices. The concrete tanks are structurally sound. The mechanical equipment including weirs, bridge, and rotating equipment are approaching the end of their service life and are not expected to provide reliable and continuous service for the 20-year design period.

As shown in Table 7-5 and 7-6, the primary clarifiers do not meet the requirements for Reliability Class II. The reliability criteria require that primary clarifiers should be sufficient in number and size so that, with the largest flow capacity unit out of service, the remaining units have a design flow capacity of at least 50 percent of the design flow at the 2028 and 2038 maximum month and peak hour flows. In addition, the primary clarifier at the Sekiu WWTP does not meet the design criteria for surface overflow rates at the 2028 and 2038 peak hour flows. Additional primary clarifier capacity at the Sekiu

WWTP is therefore required. The Clallam Bay WWTP primary clarifier has adequate capacity for the 2028 and 2038 flows but lacks redundancy. Ecology has indicated that they may allow a variance for the redundancy requirement for entities that lack sufficient funding.

ROTATING BIOLOGICAL CONTACTOR BASINS (RBC BASINS)

Each WWTP is equipped with parallel trains of mechanically rotated two-stage RBC basins. The total surface area of the RBCs at the Clallam Bay WWTP is 50,000 square feet and the total surface area of the RBCs at the Sekiu WWTP is 165,000 square feet.

The mechanical and structural components of the existing RBC units appear to be in good condition. The RBCs at both WWTPs appear to have adequate capacities to treat projected hydraulic and organic loading for 2028 and 2038.

SECONDARY CLARIFIERS

The WWTPs each have one secondary clarifier. The secondary clarifiers at both WWTPs have 9-foot SWD which is on the shallow end of typical clarifier depth design criteria. The secondary clarifier at the Clallam Bay WWTP has an 18-foot diameter and the secondary clarifier at the Sekiu WWTP has a 22-foot diameter. They are both peripheral feed clarifiers with center withdrawal, which is opposite of current best practices. The concrete tanks are structurally sound. The mechanical equipment including weirs, bridge, and rotating equipment are approaching the end of their service life and are not expected to provide reliable and continuous service for the 20-year design period.

As shown in Table 7-5 and 7-6, the secondary clarifiers do not meet the requirements for Reliability Class II. The reliability criteria require that secondary clarifiers should be sufficient in number and size so that, with the largest flow capacity unit out of service, the remaining units have a design flow capacity of at least 50 percent of the design flow at the 2028 and 2038 maximum month and peak hour flows. Each WWTP needs an additional secondary clarifier with sufficient capacity to meet the reliability criteria.

The most significant factors that influence the performance of secondary clarifiers include: clarifier design, surface overflow rate (SOR), solids loading rate (SLR), and sludge settleability.

As shown in Tables 7-5 and 7-6, the secondary clarifiers would not meet the design criteria for surface overflow rates at the 2028 and 2038 peak hour flows at both WWTPs.

The existing secondary clarifier sludge pumps are constant speed pumps with limited capability to control the WAS pumping rates.

AERATION BLOWERS

There is one relatively new and one older blower at the Clallam Bay WWTP, each with a capacity of 140 SCFM at 3 psig. The blowers at the Sekiu WWTP both have a design capacity of 275 CFM at 4.5 psig. Although these blowers are currently operating satisfactorily, they are nearing the end of their useful life.

UV DISINFECTION SYSTEM

The existing UV disinfection system at each of the WWTPs consist of a Trojan UV3000PTP 3075 with two parallel banks of modules. There is typically only one bank operating at a time with the other module in standby. It should be noted that there are no provisions for remotely alerting WWTP staff to alarm conditions nor any provisions for automatically transferring flow from the duty bank to the redundant bank in case of bank failure.

Daily UV transmittance (UVT) readings of the WWTP effluent were taken by plant operators from June 25 to July 12, 2018. The average transmittance reading over this time period was 56.7 percent for the Clallam Bay WWTP and 51.6 percent for the Sekiu WWTP. At 65 percent transmittance, the Trojan representative states that the UV design dose is 30 mJ/cm^2 and can treat a flow up to 112,000 gpd. Reduced disinfection performance is expected at the lower UVT valves measured at the WWTPs.

Based on the data provided, the recommended design UV transmittance is 50 percent. (Note: We are waiting to hear from the manufacturer's representative what the capacity at 50 percent transmittance is).

The UV systems are not able to hydraulically pass the peak hour flows. The UV building at the Sekiu WWTP has experienced flooding during periods of high flows.

AEROBIC DIGESTERS

The County hauls biosolids from the digesters for further treatment to the City of Port Angeles wastewater treatment facility. Solids are pumped from the digesters to liquid transport trucks using a trash pump. Production of Class B biosolids using aerobic digestion would provide greater flexibility for long-term management of waste solids at the WWTP. An analysis is performed below to see if there is enough capacity in the existing digesters at each WWTP to produce Class B biosolids at projected 2038 average annual and maximum month flows and loadings.

Waste solids from the primary and secondary clarifiers are conveyed to the aerobic digesters for stabilization and solids reduction. The sludge is aerated and mixed in the digesters to provide oxygen to microorganisms which break down available food to carbon dioxide, water, and cell tissue. As the supply of available food is depleted, the microorganisms begin to consume their own cell mass to obtain energy for cell

maintenance. When this occurs, cell mass is oxidized aerobically to form carbon dioxide, water, and ammonia. A major objective of aerobic digestion is to reduce the mass of the solids for disposal. This reduction takes place predominantly with the biodegradable (organic) content of the sludge, although there may be some removal of inorganics through biological processes as well.

Also, odor may be reduced by stabilizing the sludge in the aerobic digestion process. Wastewater treatment facilities with design flows of 5 mgd and less typically use aerobic digestion for sludge stabilization primarily due to lower capital costs and ease and reliability of operation.

Presently, the Clallam Bay WWTP has two 12' x 14.25' x 8' SWD aerobic digesters with a combined volume of 20,300 gallons. The Sekiu WWTP has two 15.5' x 14.25' x 10' SWD aerobic digesters with a combined volume of 33,000 gallons.

The required volume for an aerobic digestion system is based on the required detention time to achieve pathogen reduction requirements to produce Class B biosolids. The State of Washington Administrative Code (WAC) provides the requirements for biosolids to be classified as Class B with respect to pathogens. WAC 173-308-170 states that to achieve Class B biosolids using aerobic digestion, the biosolids must be agitated with air or oxygen to maintain aerobic conditions for a specific solids retention time (SRT) at a specific temperature. Values for the SRT and temperature must be between 40 days at 20 degrees C (68 degrees F) and 60 days at 15 degrees C (59 degrees F) when accommodating the projected maximum month sludge loadings. The design temperature used in the digester analysis is 15 degrees C with an SRT of 60 days for both WWTPs.

An aerobic digester is sized for 2028 and 2038 flows with the following equation.

Volume of digester = $(SRT, d)(M_{TSS,DS})/(X_i)(8.34)$

SRT = Sludge retention time, d (60 days, per regulation)
$M_{TSS,DS}$ = Mass of TSS in digested sludge wasted from digesters, lb/d
X_i = TSS concentration in digester, mg/L

The required volume of the digesters for the 2038 design criteria is calculated below. For the digester analysis, it is assumed that the primary clarifiers remove 65 percent of the influent TSS and 30 percent of the influent BOD. With an influent max month TSS of 96 lb/d at the Clallam Bay WWTP and 147 lb/d at the Sekiu WWTP, the mass of TSS wasted to the digesters as primary sludge is calculated as:

Clallam Bay $M_{TSS,PS} = (0.65)(96 \text{ lb TSS/d}) = 62 \text{ lb TSS/d}$
Sekiu $M_{TSS,PS} = (0.65)(147 \text{ lb TSS/d}) = 96 \text{ lb TSS/d}$

For the digester analysis, it is assumed that 95 percent of the BOD in the primary effluent is removed by the RBCs, with an observed yield of 0.75 lb VSS/lb BOD removed, and

that the ratio of VSS/TSS in the waste activated sludge is 0.75. With an influent max month BOD of 89 lb/d at the Clallam Bay WWTP and 197 lb/d at the Sekiu WWTP, the mass of TSS wasted to the digesters as waste activated sludge (WAS) from the secondary clarifier is calculated as:

Clallam Bay $M_{TSS,WAS}$ = (89 lb BOD/d)(0.7)(0.95)(0.75 lb VSS/lb BOD)(lb TSS/0.75 lb VSS) = 59 lb/d

Sekiu $M_{TSS,WAS}$ = (197 lb BOD/d)(0.7)(0.95)(0.75 lb VSS/lb BOD)(lb TSS/0.75 lb VSS) = 131 lb/d

The total mass of TSS wasted to the digesters is the combined mass in the primary sludge and WAS:

Clallam Bay $M_{TSS,WS}$ = 62 + 59 = 121 lb/d

Sekiu $M_{TSS,WS}$ = 96 + 131 = 227 lb/d

Assuming that the ratio of VSS/TSS in the waste sludge is 0.75, the mass of VSS in the waste sludge to the digesters is calculated as:

Clallam Bay $M_{VSS,WS}$ = (0.75)(121 lb/d) = 91 lb/d

Sekiu $M_{VSS,WS}$ = (0.75)(227 lb/d) = 170 lb/d

Assuming 35 percent of the TSS is inert, the mass of inert TSS (iTSS) to the digesters is calculated as:

Clallam Bay $Mi_{TSS,WS}$ = (0.35)(121 lb/d) = 43 lb/d

Sekiu $Mi_{TSS,WS}$ = (0.35)(227 lb/d) = 79 lb/d

Assuming 45 percent VSS destruction in the aerobic digesters, the mass of TSS wasted from the digesters as digested sludge is calculated as:

$$M_{TSS,DS} = (0.55)(M_{VSS,WS}) + M_{iTSS,WS}$$

Clallam Bay $M_{TSS,DS}$ = (0.55)(91 lb/d) + 43 lb/d = 93 lb/d

Sekiu $M_{TSS,DS}$ = (0.55)(170 lb/d) + 79 lb/d = 173 lb/d

Using the equation above, the required volume of the digester for the current operation with a solids concentration of 1% in the digesters is calculated:

$$\text{Digester Volume} = (SRT)(M_{TSS,DS})/(X_i)(8.34 \text{ lb/gal})*(10^6 \text{ gal/ million gal})$$

Clallam Bay Digester Volume = (60 d)(93 lb/d)/(10,000 mg/L)(8.34 lb/gal)*(10^6 gal/ million gal) = 67,000 gallons

Sekiu Digester Volume = (60 d)(173 lb/d)/(10,000 mg/L)(8.34 lb/gal)*(10^6 gal/ million gal) = 124,500 gallons

Based on the assumptions in this analysis, the existing digester volumes are not sufficient to reliably produce Class B biosolids for the 2038 design criteria.

Some WWTPs can save money by dewatering their sludge prior to hauling. Based on estimated capital and O&M costs for sludge dewatering, the payback would be too long to justify changing from hauling liquid sludge

NON-POTABLE WATER SYSTEM

The existing non-potable water system at each WWTP is currently in serviceable condition. However, it is recommended that the pumps, hydropneumatic tanks, electrical and controls are replaced in the near future due to the existing equipment approaching the end of their service life.

ELECTRICAL, CONTROL SYSTEM, AND TELEMETRY

The existing 50-kW generators at each WWTP are currently in serviceable condition. They were installed approximately 20-years ago and only have approximately 1,500 hours on them. They are not expected to need replacement in the near future and are anticipated to be able to provide reliable and continuous standby power.

The existing control system at each WWTP does not have the capability or provisions for alerting off-site personnel of alarm conditions or power outages at the facilities. It is recommended that the WWTP control and telemetry systems are upgraded to include provisions for off-site monitoring and alerting personnel of alarm conditions.

OUTFALL

A cathodic protection survey of the outfall pipelines was completed by Corrpro in 2013 (2013 Survey). The 2013 Survey found that the existing cathodic protection systems were no longer serviceable and provided recommendations for work and material required to restore serviceable and reliable cathode protection to the outfall pipeline. It is recommended that the outfalls are inspected and that the work described in the 2013 Survey to restore cathodic protection systems is completed.

The hydraulic capacity of the outfall at each facility was checked at the projected 2038 flows. The Clallam Bay WWTP outfall is expected to have sufficient capacity for the 2038 design flow. The Sekiu WWTP outfall pipeline is expected to have enough capacity to convey the projected 2038 peak hour flow in its current configuration.

EVALUATION OF WWTP ALTERNATIVES

In this section, several wastewater treatment plant improvement alternatives are evaluated to provide a safe work environment, reliable, and serviceable wastewater treatment to the Clallam Bay and Sekiu communities. Each alternative is intended to provide adequate treatment to meet the existing and projected future NPDES effluent permit limits for the flows and loadings projected for the year 2038 and meet the requirements for a Reliability Class II facility as required by each WWTP's NPDES permit.

Three main alternatives were considered for primary and secondary treatment improvements to provide wastewater treatment for the projected flows and loadings. These alternatives are summarized below:

1. Alternative 1: Modification/Expansion of Both Existing RBC Facilities.

2. Alternative 2: Modification/Expansion/Upgrade of Clallam Bay Facility to Treat Wastewater from both Clallam Bay and Sekiu.

3. Alternative 3: Construct New Upland WWTP to Treat Wastewater from both Clallam Bay and Sekiu.

Within each of the three main alternatives, there are permutations based on possible infiltration and inflow reduction of 25 percent (the maximum I/I reduction typically observed with robust reduction efforts) and impacts based on receiving wastewater from the Clallam Bay Corrections Center (CBCC). These permutations are discussed qualitatively, in general terms due to the number of alternatives generated when considering I/I reductions and receiving flow from CBCC.

The common elements of each of the three main alternatives evaluated are listed below and a more detailed description of each item is provided in the following section:

1. Headworks: New headworks would be constructed, which would consist of a new concrete structure with the following components:

    a. Influent flow metering and sampling.
    b. Mechanical fine screen system.
    c. Manual bypass screen
    d. Aerated grit chamber and grit hydrocyclone/classifier system.

2. UV Disinfection Equipment: The existing UV disinfection equipment would be upgraded to eliminate hydraulic bottlenecks and provide sufficient UV dose for disinfection at the most challenging conditions (peak flows and low levels, 10^{th} percentile, of UV transmittance).

3. Non-Potable Water System: The existing non-potable water systems require replacement. The new non-potable water systems would be equipped with new non-potable water pumps, hydropneumatic tank, instrumentation, and controls.

4. Sludge Processing Equipment: The existing sludge processing equipment requires replacement. The piping, valves, and pumps would be upgraded for reliability and serviceability.

5. Instrumentation, Telemetry, and Controls: The upgraded facilities would be equipped with provisions for alerting off-site personnel to alarm conditions at the facility.

A summary of the major components that differ between the alternatives considered is presented in Table 7-7.

TABLE 7-7

Summary of Biological Treatment and Secondary Clarification Alternatives Considered

Alternative No.	Biological Treatment	Secondary Clarification
Alternative 1: Upgrade Each WWTP	No change required.	Construct one new secondary clarifier at Clallam Bay and two new clarifiers at Sekiu and upgrade the existing secondary clarifiers.
Alternative 2: Treat flow from Sekiu and Clallam Bay at the Clallam Bay WWTP	• Activated RBC • Conventional Activated Sludge • Oxidation Ditch	Construct one new secondary clarifier and upgrade the existing secondary clarifiers.
Alternative 3: Construct a new WWTP at an upland site to treat flow from both Sekiu and Clallam Bay	• Conventional Activated Sludge • Oxidation Ditch	Construct two new secondary clarifiers.

The following sections describe the three alternatives in greater detail.

ALTERNATIVE 1: MODIFICATION/EXPANSION OF BOTH WWTPS

The objective of Alternative 1 is to maintain the existing treatment methods and maximize the use of existing treatment structures. This alternative includes

improvements to the headworks, rehabilitation of the primary clarifiers, new UV systems, new non-potable water system, construction of additional secondary clarifier capacity, and new instrumentation, telemetry, and control systems. In addition, an effluent pump station would be constructed at the Sekiu WWTP. Due to the significant I/I experienced at the Sekiu WWTP and the dilute wastewater associated with significant I/I events, it is recommended that the facility install effluent filters to meet effluent permit limits for BOD removal during storm events.

Site plans for the two plants under Alternative 1 are provided in Figures 7-11 and 7-12.

Clallam Bay Flood Protection

The Clallam Bay WWTP is within the 100-year flood zone. In order to protect public health and safety, and to qualify for federal funding, critical elements of the facility need to be protected from flooding. In addition, all alternatives assume 1 foot of potential sea level rise. Alternatives for providing the necessary protections are considered below. It is assumed that the facilities would need to be elevated to elevation 16.25 feet.

Earthen Berm

The first alternative is to construct an earthen berm around the entire Clallam Bay WWTP along the existing fence line. This alternative would be easy to construct. However, the berm would occupy a significant footprint at the plant. Also, since this alternative prevents the flow of water from occupying space that would normally provide flood storage during a flood, and it is within a critical area, county code requires that a flood impact study be performed. The flood impact study would determine if there are downstream impacts and if any mitigation would be required. It is estimated that the flood impact study and mitigation would cost approximately $30,000. In addition, facilities would need to be constructed to pump out any water entering the site via groundwater or overtopping of the berm. Because of these issues, this alternative is not further considered.

Concrete Flood Wall

The second alternative for providing flood protection to the Clallam Bay WWTP is to construct a concrete wall to hold back flood waters. This alternative has the advantage of occupying smaller footprint than the earthen berm alternative. However, similar to the earthen berm alternative, a flood impact study would be required resulting in potential mitigation, and the ability to pump water from the WWTP site is necessary. The estimated capital cost for this alternative not including a flood impact study or mitigation or facilities to pump out the site is $945,000 dollars.

Localized Building and Structure Specific Flood Proofing

The third alternative consists of modifying existing structures and constructing new facilities that place critical facilities at an elevation above the flood elevation. The modifications would consist primarily of elevating equipment and structures without expanding their footprint, which would reduce downstream impacts. Recent project experience with flood proofing individual process components at other wastewater facilities has proven to be extremely difficult. Based on this experience, this alternative is not considered a viable alternative.

Raise Site Grades

The final alternative is to raise site grades by importing fill. Every structure except for the RBC and sludge holding tanks would need to be modified or replaced to accommodate the grade change. Similar to the earthen berm alternative, a flood impact study would be required resulting in potential mitigation. The estimated capital cost for this alternative including a flood impact study or mitigation is $430,000 dollars.

Flood Protection Alternative Screening

The four alternatives were pre-screened resulting in two viable alternatives. Based on capital cost, and the fact that it is not necessary to pump water from the WWTP site, the preferred alternative is to raise site grades.

Primary Clarifiers

Reliability Criteria

At both WWTPs, there is only one primary clarifier. The facilities are required to have a redundant clarifier that is able to treat 50 percent of the peak hour flow with the largest clarifier out of service. Based on the reliability criteria, one additional clarifier should be installed to satisfy these criteria. However, based on a review of the capacity of the RBCs, the RBCs have sufficient capacity to provide biological treatment without the primary clarifiers during the maximum month loading to the RBC. Since the WWTPs are projected to be able to provide sufficient treatment without the required redundant clarifier, it may be allowable to continue to have only one primary clarifier at the WWTPs. It is recommended that a flow diversion structure is constructed to divert a portion of the influent flow directly to the RBCs during peak flows.

Rehabilitation

At both WWTPs, the existing primary clarifier mechanisms are at the end of their useful service life. It is recommended that all of the mechanical components and the walkways on the clarifiers are replaced. The primary clarifiers would be equipped with a center feed well with energy dissipating inlets, bridge supported spiral rake arms, as well as new

FRONTIER STREET

ELEVATED SITE GRADES

MODIFIED NON–POTABLE WATER SYSTEM

MODIFIED EFFLUENT STRUCTURE

UPGRADED UV SYSTEM

BAR SCREEN

FINE SCREEN

AERATED GRIT CHAMBER

PRIMARY SEDIMENTATION TANK FLOW CONTROL STRUCTURE

MODIFIED CONTROL BUILDING

SECONDARY CLARIFIER SPLITTER BOX

MODIFIED PRIMARY SEDIMENTATION TANK

ROTATING BIOLOGICAL CONTACTORS

AEROBIC DIGESTERS

MODIFIED SECONDARY SEDIMENTATION TANK

NEW SECONDARY SEDIMENTATION TANK

MODIFIED EQUIPMENT BUILDING

CLALLAM BAY WWTP SITE PLAN

SCALE: 1"=20'–0"

CLALLAM COUNTY

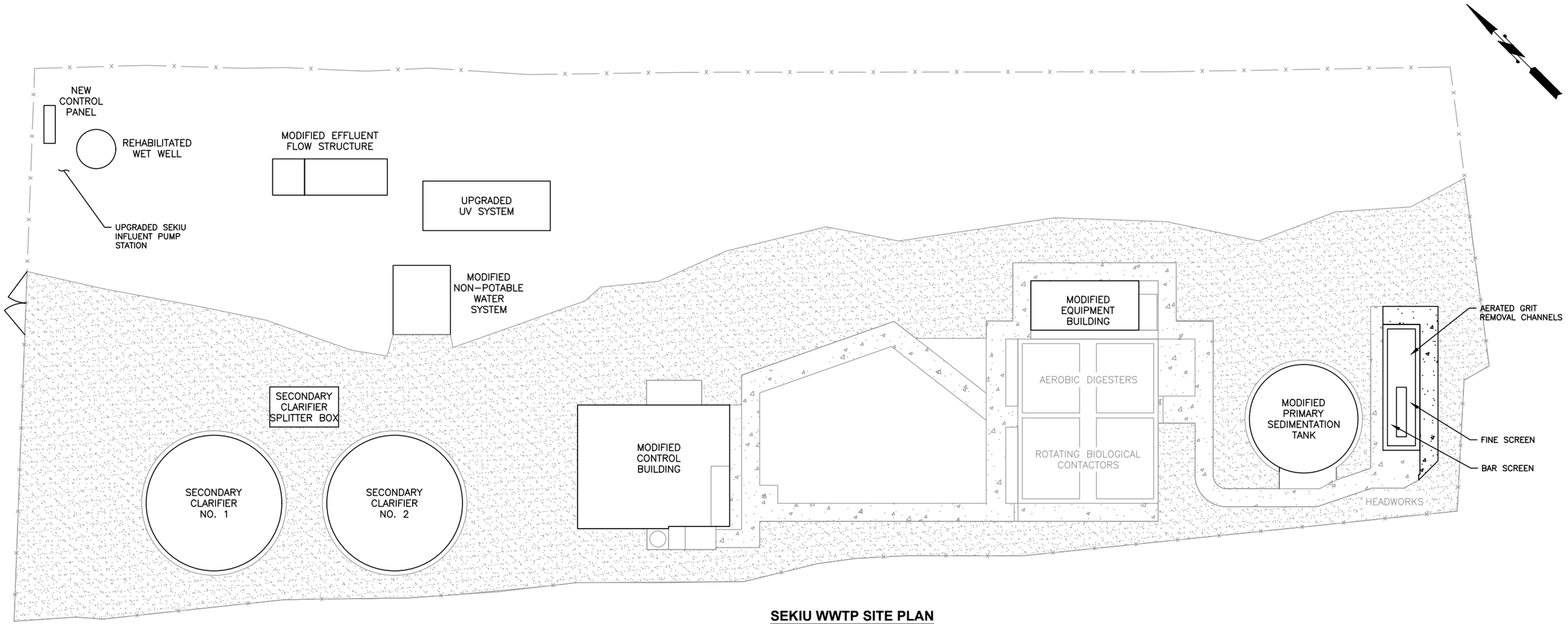
CLALLAM BAY/SEKIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 7-11

ALTERNATIVE 1 - CLALLAM BAY PROPOSED SITE PLAN

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\E–CLALLAM FULL SITE_ALT 1.DWG



SEKIU WWTP SITE PLAN

SCALE: 1/2"=1'-0"

CLALLAM COUNTY

CLALLAM BAY/SEKIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 7-12

ALTERNATIVE 1 - SEKIU PROPOSED SITE PLAN

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\E-SEKIU FULL SITE.DWG

effluent weirs and launder. The primary clarifiers would be equipped with new scum pump stations.

Secondary Clarifiers

At both WWTPs, there is only one secondary clarifier. In accordance with the criteria for Reliability Class II facilities, the WWTPs are required to have a redundant clarifier that is able to treat 50 percent of the peak hour flow with the largest clarifier out of service. The existing secondary clarifiers at both WWTPs are not able to treat 50 percent of the peak hour flow. Therefore, it is recommended that new secondary clarifiers are constructed at each WWTP.

The new secondary clarifiers would have a 13-foot sidewater depth, center-feed well with energy dissipating inlets, bridge supported spiral rake arms, and an effluent launder and weir at the perimeter of the clarifier. A new secondary clarifier splitter box would be constructed upstream of the secondary clarifiers to provide an even flow split between the clarifiers and allow operators to take clarifiers on and off line with stop gates.

One new secondary clarifier would be constructed at Clallam Bay and would be 22 feet in diameter. The existing clarifier would be rehabilitated with new equipment and the walls elevated to be above the flood elevation.

Two new 30-foot diameter secondary clarifiers would be constructed at Sekiu. The existing secondary clarifier at Sekiu could be retrofitted for use as an effluent filtration or effluent pump station basin.

UV Disinfection System

The UV disinfection system at both WWTPs lack provisions for automatically switching from a system in fault to the standby system. Also, the UV systems do not have the capability of automatically alerting operators of any fault condition or alarm situation.

Clallam Bay

The existing UV disinfection system at Clallam Bay has sufficient capacity for the projected 2038 flows. However, the system is vulnerable to flooding as it is below the 100-year flood elevation. It is recommended that the building is modified to prevent floodwaters from entering the building. It is recommended that the existing UV system is upgraded with controls to be able to automatically bring the redundant UV bank online in case the duty bank fails. The existing packaged system can be reused in the flood proofed building with the upgraded controls.

Sekiu

The existing UV disinfection system at Sekiu does not have sufficient capacity to disinfect the projected 2038 flows. It is recommended that the existing UV system is upgraded to be able to treat the projected flows. The recommended system would be packaged system in a stainless steel channel with integral weir. The system would include provisions for monitoring and alarms

Outfall Cathodic Protection

At both WWTPs, the condition of the outfall is unknown. It is recommended that both outfalls are inspected. The inspection should include a TV inspection of the interior of the pipe and a diving inspection that examines the condition of the submerged portion of the outfall.

In addition, in 2013 an inspection of the existing cathodic protection system at both WWTP outfalls found that the existing systems are not functional and are in need of replacement. It is recommended that the cathodic protection systems are replaced.

Sekiu Effluent Filtration

During periods of peak wet weather flows that consist primarily of wastewater diluted with rainwater it is difficult for the facility to achieve the required 85 percent removal of influent BOD_5 and TSS. Two possible solutions for achieving the necessary removal are reducing I/I and installing effluent filtration systems. It is recommended that I/I be removed to the extent possible as a general recommendation, and that the effluent filtration system is installed to ensure permit compliance should I/I removal efforts prove difficult.

Sekiu Outfall Hydraulic Capacity

The existing outfall serving the Sekiu WWTP does not have enough hydraulic capacity to continue to convey the projected design flow including projected flow from the WSDOC Clallam Correctional Facility by gravity. The combined 2038 peak hour flow from the Sekiu WWTP and the WSDOC CBCC correctional facility is 2.22 mgd. Three alternatives for modifications to be able to convey the design flow through the outfall are presented below.

Construct a New Outfall

Constructing a new outfall would allow the effluent to exit the WWTP by gravity. A new outfall would consist of a larger diameter pipe constructed roughly parallel to the existing outfall. Construction of this pipe would require approximately 1,400 feet of excavation from the WWTP to the edge of the water and approximately 720 feet of marine installation in Clallam Bay. Permitting this construction would require hydrological,

anthropological, and biological evaluations, and would require permits for Rivers and Harbors Act Section 10, DNR Aquatic Lands Use Authorization, and other County required Permits. The permitting process would take several years to complete prior to construction. The permitting, design, and construction costs for this alternative are much higher than the other alternatives.

Construct a Head Box

A head box is often used to provide the additional head required to maintain gravity flow through the outfall pipe. A head box typically consists of a non-pressurized reservoir with walls taller than the highest water surface elevation required for gravity flow. The walls of the existing effluent flow metering structure could be modified to be elevated to have the necessary head to convey the effluent via gravity flow.

The effluent head box structure would be equipped with a check valve to enable gravity flow at low tide and lower flows. At higher tides and flows an effluent pump would be used to increase the water level in the head box structure to the point that it would flow out of the outfall. The walls of the existing effluent structure would need to be raised up to elevation 33 feet. The top of the head box would be approximately 22 feet above grade. At this elevation, the headbox alternative is not considered feasible. The WSDOC CBCC gravity effluent pipe would be submerged during high flows and access to the head box would not be convenient.

Pressurize the Outfall

Pressurizing the outfall would be accomplished by pumping the combined WWTP and WSDOC effluent. This alternative is technically feasible, comparatively inexpensive, and could be accomplished without the cost and delay of additional permitting as would be required for constructing a new outfall. In addition, a check valve could be added to the outfall pipe near the outfall structure that would allow the combined effluent to flow by gravity for the majority of the time. At flows above peak day flow, the effluent would need to be pumped. The pumps would discharge downstream of the check valve and pressurize the force main. The effluent pumps would be duplex, submersible pumps located in an adjacent wet well structure.

Modifications Required at Both Facilities

Alternative 1 would include the following modifications to the Clallam Bay and Sekiu WWTPs.

- Construct new headworks to include:
    - Influent flow metering
    - Mechanical fine screening
    - Aerated grit chamber, grit hydrocyclone/classifier system

  - Manual screen for use as redundant/bypass

- Existing RBC rehabilitation
- Construct new secondary clarifier splitter box
- Construct additional secondary clarifier
- UV disinfection system upgrades
- New non-potable water system
- Aerobic digester system improvements, to include:

  - New blowers
  - Piping and valve improvements
  - New sludge pumps

- New effluent flow meters
- Construct new control building

Permit Compliance During Construction

It is imperative that the facilities maintain permit compliance while upgrading the existing treatment facilities. Performing the work while the facilities are in service will present some complexities that will be addressed in detail during design and during construction. Prior to beginning any work, the County will provide a Plan of Operation to the Department of Ecology. The Plan of Operation will provide details on the plans for maintaining interim operation during construction. The construction cost estimate includes provisions for temporary facilities.

Some examples on how permit compliance will be maintained during construction are as follows:

- Keep existing treatment processes in operation during construction of new processes.
- Provide temporary piping and pumping as required to construct improvements.
- Provide temporary electricity and standby power during construction.
- Provide temporary treatment facilities during construction, i.e., temporary chlorination and dechlorination facilities for disinfection.

The estimated capital cost for this alternative is $19,510,000.

ALTERNATIVE 2: UPGRADE CLALLAM BAY WWTP TO TREAT FLOW FROM BOTH WWTPS

In Alternative 2, the Clallam Bay WWTP is upgraded to treat wastewater from both Clallam Bay and Sekiu. The Sekiu WWTP would be decommissioned and a new lift

station and force main would be constructed to convey wastewater from Sekiu to the Clallam Bay WWTP. The existing Sekiu Lift Station could be upgraded for this purpose. New force mains consisting of parallel 12-inch and 4-inch diameter HDPE would need to be installed in Highway 112 from the Sekiu to Clallam Bay WWTPs. The 12-inch diameter force main is required to handle peak flows and the 4-inch diameter force main would be used during periods of lower flow. The Clallam Bay WWTP would be upgraded to be able to treat the design flows and loadings from both WWTPs.

Three alternatives were considered for primary and secondary treatment improvements. These alternatives are summarized below:

A. Modification/Expansion of the Clallam Bay Facility to an Activated RBC Facility.
B. Modification/Expansion of the Clallam Bay Facility to a Conventional Activated Sludge Facility.
C. Modification/Expansion of the Clallam Bay Facility to an Oxidation Ditch Facility.

Alternatives for both membrane bioreactors (MBRs) and sequencing batch reactors (SBRs) were initially considered. However, due to higher project costs, and since both of these alternatives have additional operational complexity and would require a large equalization basin volume, these alternatives were rejected.

Table 7-8 presents the projected flows and loading from both Clallam Bay and Sekiu that would be treated at the upgraded Clallam Bay facility in Alternative 2.

TABLE 7-8

WWTP Influent Design Criteria for Combined Sekiu and Clallam Bay WWTP

Parameter	2018 Value	Projected 2028 Value	Projected 2038 Value	Projected 2038 Value w/25% I/I Reduction
Average Annual Flow, AAF (mgd)	0.101	0.107	0.111	0.098
Maximum Month Flow, MMF (mgd)	0.219	0.223	0.229	0.186
Peak Day Flow, PDF (mgd)	0.764	0.768	0.774	0.620
Peak Hour Flow, PHF (mgd)	1.788	1.882	1.944	1.368
Average Annual BOD_5 Loading (lb/d)	111	122	135	--
Maximum Month BOD_5 Loading (lb/d)	235	260	286	--
Average Annual TSS Loading (lb/d)	83	92	101	--
Maximum Month TSS Loading (lb/d)	198	220	243	--

Activated RBC

The concept of this alternative is to minimize additional construction by continuing use of the existing RBCs and adding additional contact/stabilization tanks to modify the existing process to be a contact stabilization treatment process. This process provides a high degree of BOD removal in a relatively limited volume compared to other complete mix activated sludge processes, and can be readily paired with RBCs. In the configuration proposed for this alternative, primary effluent would flow into the contact basin, followed by the RBCs and secondary clarifiers. A portion of the primary effluent would also flow directly to the RBCs to ensure adequate soluble BOD for the fixed film bacteria. The stabilization basins would receive activated sludge from the secondary clarifiers for additional aerobic treatment and would seed the contact basin with mixed liquor. The existing primary clarifier would be rehabilitated and equipped with a flow diversion structure to bypass flows around the clarifier during high flows. New 38-foot diameter secondary clarifiers would be constructed in order to have sufficient process capacity.

Table 7-9 presents the advantages and disadvantages for the activated RBC process.

TABLE 7-9

Activated RBC Alternative

Advantages	Disadvantages
• Familiarity with process	• Primary clarifiers needed
• Good effluent quality	• Variable flow not desirable
• Repurposed tanks	• Moderate operational costs
• Smaller additional footprint	• Added operational complexity
• Efficient removal of scum in secondary clarifiers	

The estimated capital cost for this alternative is $21,947,000.

The proposed site plan for this alternative is shown on Figure 7-13.

Conventional Activated Sludge

With this alternative, biological treatment would be provided in rectangular aeration basins and settling provided in circular, secondary clarifiers. Each new aeration basin would have three selector zones designed to promote the rapid uptake of soluble substrate, yielding a mixed liquor with good settling characteristics. Each aeration basin would also have three aerobic zones and two anoxic zones. The secondary clarifiers would be designed to provide efficient and effective solids separation. Return and waste activated sludge pumping systems would also be required under this option.

FRONTIER STREET

ELEVATED SITE GRADES

MODIFIED
NON–POTABLE
WATER SYSTEM

MODIFIED EFFLUENT
STRUCTURE AND
PUMP STATION

UPGRADED
UV
SYSTEM

BAR SCREEN

FINE SCREEN

PRIMARY SEDIMENTATION
TANK FLOW CONTROL
STRUCTURE

AERATED GRIT
CHAMBER

MODIFIED
CONTROL
BUILDING

CONTACT/STABILIZATION
BASINS

SECONDARY
CLARIFIER
SPLITTER BOX

MODIFIED
PRIMARY
SEDIMENTATION
TANK

ROTATING BIOLOGICAL
CONTACTORS

AEROBIC DIGESTERS

MODIFIED
SECONDARY
SEDIMENTATION
TANK

NEW
SECONDARY
SEDIMENTATION
TANK

MODIFIED
EQUIPMENT
BUILDING

CLALLAM BAY WWTP SITE PLAN

SCALE: 1"=20'–0"

CLALLAM COUNTY

**CLALLAM BAY/SEKIU GENERAL SEWER/
WASTEWATER FACILITIES PLAN**

FIGURE 7-13

**ALTERNATIVE 2A - CLALLAM BAY ACTIVATED RBC
PROPOSED SITE PLAN**

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L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\E–CLALLAM FULL SITE_ALT 2.DWG

With this alternative, the primary clarifiers and RBCs would be abandoned and/or repurposed. New 38-foot diameter secondary clarifiers would be constructed in order to provide the necessary treatment capacity.

Table 7-10 presents the advantages and disadvantages for the activated conventional activated sludge process.

TABLE 7-10

Conventional Activated Sludge Alternative

Advantages	Disadvantages
• Resistant to shock loading • Good effluent quality • Produces sludge with excellent settling characteristics • Readily expandable • Process can reliable remove ammonia • Efficient removal of scum in secondary clarifiers	• High operational cots • High operational complexity • High capital cost • New process for operators

The estimated capital cost for this alternative is $25,528,000.

Oxidation Ditch

The oxidation ditch process is similar to the conventional activated sludge process described above, except that the biological reactor is an elongated oval-shaped tank. RAS and influent are mixed in exterior selector tanks, and then discharged into the oxidation ditch. The mixed liquor travels in a path around the oval-shaped ditch, with a center wall creating the "racetrack." The mixed liquor is aerated and kept in motion by horizontal brush aerators. Submersible mixers are used to keep the mixed liquor in suspension when the brush aerators are shutdown during anoxic periods. The mixed liquor is withdrawn over a weir and carried to the secondary clarifiers. Two secondary clarifiers would be provided for redundancy and would provide for efficient and effective solids separation.

Oxidation ditches are designed to operate at longer hydraulic retention times (HRT) than the conventional activated sludge system, in a process mode known as "extended aeration," which results in lower sludge production. Volume requirements are greater than for conventional aeration basins, but the process is typically more stable and accommodates greater fluctuations in flow and loading rates without process upsets.

The existing primary clarifiers, RBCs, and secondary clarifiers would be abandoned. The oxidation ditch would be equipped with bioselectors to promote the growth of floc

forming bacteria. New secondary clarifiers would be constructed for the sake of simplifying the piping control scheme.

Table 7-11 presents the advantages and disadvantages for the oxidation ditch process.

TABLE 7-11

Oxidation Ditch Alternative

Advantages	Disadvantages
• Resistant to variable loading • Stable operation • Relatively simple to operate • Good effluent quality • Produces lower yield of sludge, and with moderate settling characteristics • Efficient removal of scum in secondary clarifiers	• Moderate operational cots • Larger footprint than other activated sludge alternatives • High capital cost • New process for operators

The estimated capital cost for this alternative is $24,370,000.

Sekiu Lift Station Upgrades and Conveyance Force Mains

In order to convey the flow of wastewater from the Sekiu WWTP to the Clallam Bay WWTP, the existing Sekiu Lift Station would be upgraded. The lift station would consist of a new or rehabilitated wet well with new submersible pumps. The new control panels would be mounted outdoors adjacent to the wet well. The control panels would be equipped with telemetry for remote control and monitoring.

The lift station would discharge into a parallel 12-inch and 4-inch diameter HPDE force mains located in Highway 112 that goes to the new headworks at the Clallam Bay WWTP. The force mains would be approximately 12,500 feet long. The force main alignment is subject to sliding hillsides along multiple segments. In order to provide reliability and redundancy, several isolation and bypass pumping connections would be installed in vaults along the alignment. In addition, special pipe fittings would be used to allow some movement at key locations along the alignment. There would be parallel force mains in order to provide appropriate scouring velocities in the smaller pipe during periods of lower flow. This would keep solids in suspension within the force main and prevent slug loads to the WWTP during periods of high flow. The pump station would be equipped with a control system and valve actuators to automatically direct flow to the necessary force main depending on the flow to the station.

Flood Protection

The flood protection required at Clallam Bay WWTP in order to receive flows from both Clallam Bay and Sekiu, is similar to the flood protection described in Alternative 1.

Clallam Bay Outfall Hydraulic Capacity

The existing outfall serving the Clallam Bay WWTP does not have enough hydraulic capacity to continue to convey the projected design flow from Clallam Bay including projected flow from Sekiu by gravity. The combined 2038 peak hour flow from the Sekiu WWTP and the Clallam Bay WWTP is 1.94 mgd. Three alternatives for modifications to be able to convey the design flow through the outfall are presented below.

Construct a New Outfall

Constructing a new outfall would allow the effluent to exit the upgraded Clallam Bay WWTP by gravity. A new outfall would consist of a larger diameter pipe constructed roughly parallel to the existing outfall. Construction of this pipe would require approximately 1,300 feet of excavation from the WWTP to the edge of the water and approximately 820 feet of marine installation in Clallam Bay. Permitting this construction would require hydrological, cultural resource, and biological evaluations, and would require permits for Rivers and Harbors Act Section 10, DNR Aquatic Lands Use Authorization, and other County required Permits. The permitting process would take several years to complete prior to construction. The permitting, design, and construction costs for this alternative are much higher than the other alternatives.

Pressurize the Outfall

Pressurizing the outfall would be accomplished by pumping the combined WWTP effluent. This alternative is technically feasible, comparatively inexpensive, and could be accomplished without the cost and delay of additional permitting as would be required for constructing a new outfall. The effluent pumps would be duplex, submersible pumps located in an adjacent wet well structure.

Construct a Head Box

A head box is often used to provide the additional head required to maintain gravity flow through the outfall pipe. A head box typically consists of a non-pressurized reservoir with walls taller than the highest water surface elevation required for gravity flow. The walls of the existing effluent flow metering structure could be modified to be elevated to have the necessary head to convey the effluent via gravity flow.

At higher tides and flows an effluent pump would be used to increase the water level in the head box structure to the point that it would flow out of the outfall. The walls of the

existing effluent structure would need to be raised up to elevation 21.5. The top of the head box would be approximately 5.25-feet above grade. Constructing improvements to convey the effluent via a headbox is preferable since during the majority of the time, effluent would flow by gravity and it has a similar capital cost as pressurizing the outfall.

WWTP Modifications

Alternative 2 would include the following modifications to the Clallam Bay WWTP independent of which alternative is selected.

- Construct new headworks to include:
    - Influent flow metering
    - Mechanical fine screening
    - Aerated grit chamber, grit hydrocyclone/classifier system
    - Manual screen for use as redundant/bypass
- Construct new secondary clarifier splitter box
- Construct two new 38-foot diameter secondary clarifiers
- New UV disinfection system
- New non-potable water system
- Aerobic digester system improvements, to include:
    - New blowers
    - Piping and valve improvements
    - New sludge pumps
- New effluent flow meters
- Construct new control building
- Construct outfall modifications

Outfall Cathodic Protection

The condition of the Clallam Bay WWTP outfall is unknown. It is recommended that the outfall is inspected. The inspection should include a TV inspection of the interior of the pipe and a diving inspection that examines the condition of the submerged portion of the outfall.

In addition, in 2013 an inspection of the existing cathodic protection system at both WWTP outfalls found that the existing systems are not functional and are in need of replacement. It is recommended that the cathodic protection systems on the Clallam Bay WWTP outfall are replaced.

Permit Compliance During Construction

It is imperative that the facilities maintain permit compliance while upgrading the existing treatment facilities at Clallam Bay. Performing the work while the treatment facility is in service will present some complexities that will be addressed in detail during design and during construction. Prior to beginning any work, the County will provide a Plan of Operation to the Department of Ecology. The Plan of Operation will provide details on the plans for maintaining interim operation during construction. The construction cost estimate includes provisions for temporary facilities.

Some examples on how permit compliance will be maintained during construction are as follows:

- Keep existing treatment processes in operation during construction of new processes.
- Provide temporary piping and pumping as required to construct improvements.
- Provide temporary electricity and standby power during construction.
- Provide temporary treatment facilities during construction, i.e. temporary chlorination and dechlorination facilities for disinfection.

ALTERNATIVE 3: CONSTRUCT NEW UPLAND WWTP TO TREAT FLOW FROM BOTH WWTPS

In Alternative 3, a new upland WWTP is constructed to treat wastewater from both Clallam Bay and Sekiu. The new WWTP would be located out of the flood zone, the tsunami inundation zone, and the slide zone. In order to construct this alternative, the County would need to purchase and develop land suitable for the new WWTP. The WWTP would be designed with provisions to allow for expansion to possibly treat flows from the CBCC in the future. In addition, the site would be designed to allow storage of the County's critical maintenance equipment such as excavators, trucks, and other tools. This alternative assumes the new WWTP would be located in either Clallam Bay or Sekiu outside of critical areas. Table 7-12 presents the influent design criteria for the new upland WWTP.

TABLE 7-12

WWTP Influent Design Criteria for Combined Sekiu and Clallam Bay WWTP

Parameter	2018 Value	Projected 2028 Value	Projected 2038 Value	Projected 2038 Value w/25% I/I Reduction
Average Annual Flow, AAF (mgd)	0.101	0.107	0.111	0.098
Maximum Month Flow, MMF (mgd)	0.219	0.223	0.229	0.186
Peak Day Flow, PDF (mgd)	0.764	0.768	0.774	0.620
Peak Hour Flow, PHF (mgd)	1.788	1.882	1.944	1.368
Average Annual BOD_5 Loading (lb/d)	111	122	135	--
Maximum Month BOD_5 Loading (lb/d)	235	260	286	--
Average Annual TSS Loading (lb/d)	83	92	101	--
Maximum Month TSS Loading (lb/d)	198	220	243	--

New Lift Stations and Force Mains

In order to convey flow from the communities of Clallam Bay and Sekiu to the new upland WWTP, new force mains would need to be constructed and existing lift stations would need to be upgraded.

In Sekiu, to convey the flow of wastewater from the Sekiu WWTP and from the Clallam Bay community to the new upland WWTP, the existing Sekiu Lift Station would be upgraded. The lift station would consist of a new or rehabilitated wet well with new submersible pumps. The new control panels would be mounted outdoors adjacent to the wet well. The control panels would be equipped with telemetry for remote control and monitoring. The Sekiu Lift Station would convey wastewater to the new WWTP headworks via parallel 12-inch and 4-inch diameter HPDE force mains located in Highway 112. The need for parallel force mains from Sekiu to the new upland WWTP would be the same as discussed in the previous alternative.

In Clallam Bay, the Light House Lift station would be upgraded and the discharge force main would be modified to bypass the old Clallam Bay WWTP by connecting to the Clallam Bay Lift Station force main. The existing Clallam Bay Lift Station would be upgraded to receive flow from the Light House Lift Station. The upgraded Clallam Bay Lift Station would discharge into parallel 8-inch and 4-inch diameter HDPE force mains located in Highway 112 that convey wastewater to the new wet well at the upgraded Sekiu Lift Station. The force main from the Clallam Bay Lift Station to the Sekiu Lift Station would be approximately 12,500 feet long. The force main alignment is subject to sliding hillsides along multiple segments. In order to provide reliability and redundancy, several isolation and bypass pumping connections would be installed in vaults along the alignment. In addition, special pipe fittings would be used to allow some movement at key locations along the alignment.

WWTP Modifications

Alternative 3 would include the construction of the following new facilities at the new upland WWTP independent of which process alternative is selected.

- Headworks to include:
    - Influent flow metering
    - Mechanical fine screening
    - Aerated grit chamber, grit hydrocyclone/classifier system
    - Manual screen for use as redundant/bypass
- Secondary clarifier splitter box
- Two 38-foot diameter secondary clarifiers
- UV disinfection system
- Non-potable water system
- Aerobic digester to include:
    - Blowers
    - Piping and valves
    - Sludge pumps
- New effluent flow meters
- Equipment/control building
- Effluent pipe extension to existing outfall
- Effluent pump station
- Outfall modifications

Type of Plant and Biological Treatment

Similar to Alternative 2, a number of types of plants and biological treatment schemes could be employed for Alternative 3. For the purposes of this evaluation, conventional activated sludge and oxidation ditch were considered. Sizing would be similar to that for Alternative 2.

The estimated capital cost for the Conventional Activated Sludge alternative is $29,357,000.

The estimated capital cost for the Oxidation Ditch alternative is $27,334,000.

The proposed site plan for this alternative is shown on Figure 7-14.

Permit Compliance During Construction

It is imperative that the existing facilities maintain permit compliance while constructing the new upland WWTP. Constructing a new upland WWTP will alleviate some of the complexities associated with work to upgrade the existing WWTP's under the other alternatives. Plans to maintain permit compliance will be addressed in detail during design and during construction. Prior to beginning any work, the County will provide a Plan of Operation to the Department of Ecology. The Plan of Operation will provide details on the plans for maintaining interim operation during construction. The construction cost estimate includes provisions for temporary facilities.

Some examples on how permit compliance will be maintained during construction are as follows:

- Keep existing WWTPs in operation during construction of new WWTP.
- Provide temporary piping and pumping as required to construct improvements.

ALTERNATIVE WASTEWATER TREATMENT TECHNOLOGIES

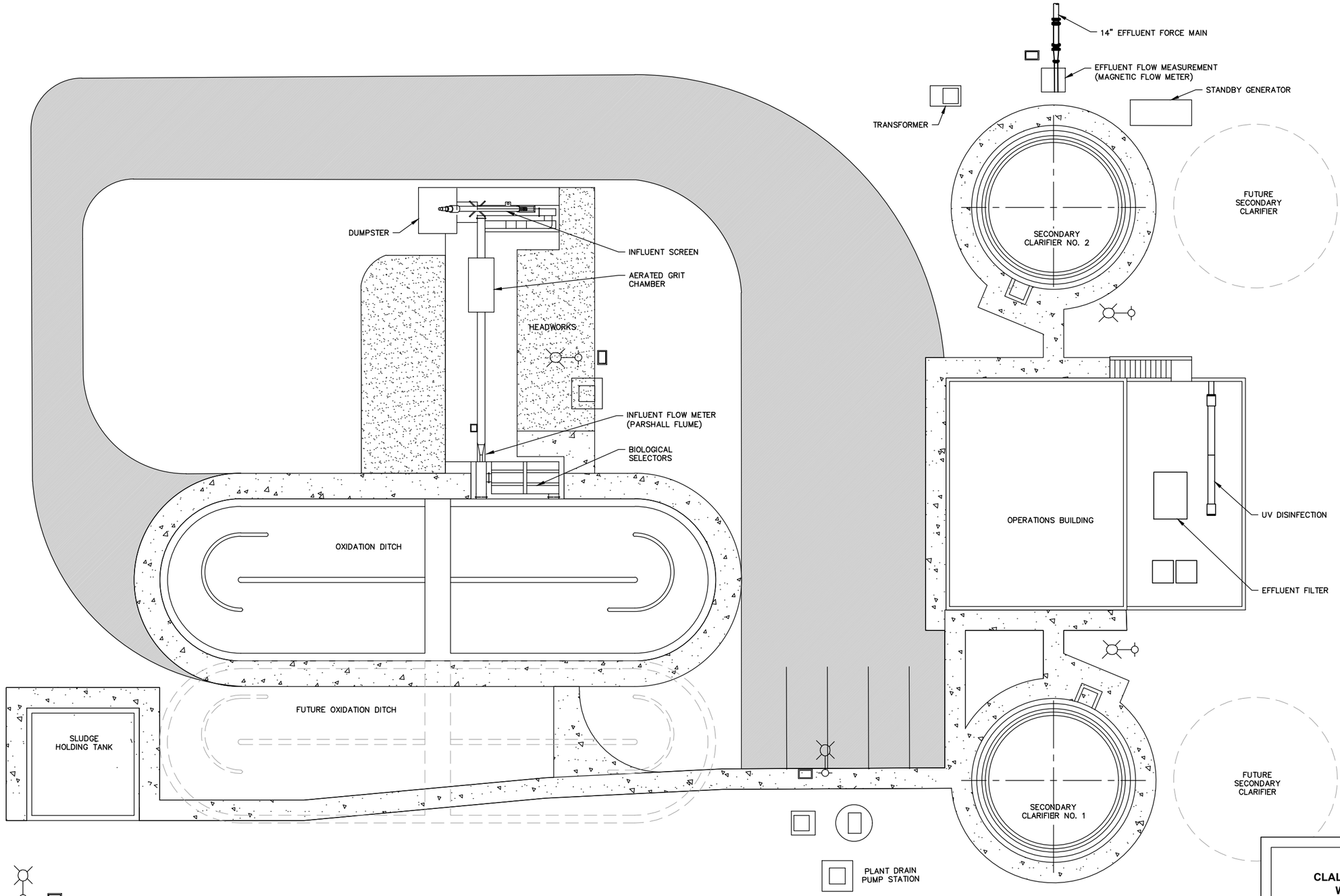
Per discussion with the County, alternative wastewater treatment technologies were evaluated for Clallam Bay–Sekiu. These technologies included (1) Composting Toilets; (2) Large On-site Sewage Systems; and (3) Lagoon Treatment Systems.

COMPOSTING TOILETS

The following information regarding composting toilets was obtained from *Water Conserving On-site Wastewater Treatment Systems - Recommended Standards and Guidance*, published by the Washington State Department of Health (July 1, 2012):

1. Composting Toilet are defined as a system designed to store and compost (primarily by unsaturated, aerobic microbial digestion) human excrement (human urine and feces) to a stable soil-like material called "humus." These systems are commonly designed to accommodate fecal and urinary wastes (human excrement), toilet paper and small amounts of organic carbonaceous material added to assist their function.

2. The owner/operator of a composting toilet system should be aware that the successful operation of these systems requires a consistent diligence to the details of the composting process. Only individuals, private organizations or government agencies who are willing to accept the responsibility of composting human excrement should be involved. If composting toilet systems are not routinely monitored and maintained as required, or improperly operated, they will fail and the owner will be faced with disposing of unprocessed human excrement. Owners/operators of



WWTP SITE PLAN
SCALE: 1"=20'

CLALLAM COUNTY
CLALLAM BAY/SEKIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 7-14

ALTERNATIVE 3B - NEW UPLAND OXIDATION DITCH WWTP

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L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\FIGURE 7-14.DWG

composting toilet systems should also be fully aware of how the final composted product may either be used for beneficial purposes or disposed according to federal and state sludge/biosolids laws and regulations.

3. Use of a waterless toilet requires a means to properly treat and dispose of the remaining greywater. Greywater treatment may be achieved through an on-site sewage system or public sewer, or through greywater treatment and reuse via subsurface landscape irrigation, saving potable water for other purposes.

4. Greywater systems are virtually the same as combined-wastewater on-site sewage systems. Gravity flow greywater systems consist of a septic tank and a subsurface drainfield. Pressurized greywater systems consist of a septic tank, a pump chamber or vault, and a subsurface drainfield. Other types of sewage technologies, pre-treatment methods and drainfield design and materials options may also be incorporated in greywater systems.

5. The primary distinction between a greywater system and a combined wastewater system is the lower volume of wastewater. As a result the size of the septic tank and the subsurface drainfield is smaller compared to a system that treats and disposes of all the household wastewater (combined) through a septic tank and drainfield.

Based on this information from the Department of Health, discussions with Ecology and County staff, and past experience in the Clallam Bay–Sekiu area, the following conclusions are provided:

1. Composting toilets could be installed in Clallam Bay–Sekiu. However, as noted by the Department of Health, "constant diligence" and maintenance by the homeowners would be required. In addition, management of the composted feces ("humus") and treatment of greywater would be required. In order to be successful, the community would need to accept these responsibilities and support a conversion to composting toilets.

2. The toilets could be purchased and installed for a few thousand dollars per household; however, in addition to this expense, there would be costs to re-plumb the homes to route the greywater separately. The soils and climate in the area are not conducive to individual greywater treatment systems (septic tank and a subsurface drainfield), so either (1) the existing wastewater collection and treatment systems would need to be maintained (with down-sized treatment) or (2) Large On-Site Systems (LOSS systems) would need to be constructed. As described below, LOSS systems are not considered feasible in the Clallam Bay-Sekiu area.

3. Based on discussion with the Department of Ecology, no public sewer systems have converted to composting toilets in the past in Washington State.

Because of these issues, conversion to composting toilets is not recommended.

LARGE ON-SITE SEWAGE SYSTEMS

In theory, the Clallam Bay –Sekiu sewerage could be converted into several Large On-site Sewage (LOSS) Systems. LOSS systems offer an alternative to centralized municipal sewage treatment plants and can serve from 10 to about 370 individual residences, or equivalent flows from schools and churches, campgrounds and recreation vehicle parks, resorts or state park sites, or smaller cities or towns. Department of Health LOSS Program staff review and approve LOSS project applications state-wide. The LOSS rule is Chapter 246-272B WAC, developed under authority of Chapter 70.118B RCW. The revised rule became effective July 1, 2011. All existing LOSS systems are required to obtain and renew annual operating permits from the Department of Health.

LOSS systems require septic tanks and drainfield. Larger systems often involved higher level treatment methods, such as recirculating gravel filters, in combination with a drainfield, particularly when there is a concern about nutrients such as nitrates in the groundwater.

Per discussion with County staff and Ecology, LOSS systems are not expected to be feasible for Clallam Bay-Sekiu. In theory, multiple large mounds and/or recirculating gravel filter systems could be constructed; however, implementation would require new collection system piping and still require repair of some of the existing conveyance system. It is expected that the systems would fail due to the nature of the soils and climate, as have other similar systems in the area. The reason public sewers and treatment plants were constructed in the first place was because on-site systems were failing,

Because of these concerns, conversion to large on-site sewage systems is not recommended.

LAGOON TREATMENT SYSTEMS

Lagoon treatment systems can be cheaper to construct and operate for communities the size of Clallam Bay-Sekiu. Such systems are also simpler to operate; however, due to multiple issues, many communities have converted to mechanical plants (as are used in Clallam Bay and Sekiu) from lagoon systems. These issues include:

1. Lagoon systems require much larger space than mechanical plants.

2. Lagoons often leak; accordingly, Ecology requires that new lagoons be double-lined with leak protection, significantly increasing the cost.

3. Most importantly, most lagoons will provide substantially lower effluent quality compared to mechanical plants. This poorer effluent quality has led to NPDES violations, enforcement actions and third-party lawsuits for communities with lagoon plants in Washington State. EPA and Ecology can provide relaxed effluent permit limits for some lagoon plants; however, per federal law (the Clean Water Act), a community cannot be granted less stringent permit limits than previously enforced, due to a provision called "anti-backsliding". Per discussion with Ecology, this provision would likely apply to Clallam Bay-Sekiu. This would significantly increase the capital and operating cost of a lagoon plant for Clallam Bay-Sekiu.

Because of these issues, conversion to a lagoon plant is not recommended.

The Clallam Bay Correctional Center (CBCC) is a lagoon plant. In theory, wastewater from Clallam Bay-Sekiu could be conveyed to an upgraded CBCC WWTP for treatment. However, this would likely lead to more stringent permit limits for the CBCC WWTP due to the anti-backsliding provisions, which would likely make it unattractive and more costly for WSDOC (requiring secondary clarification at a minimum). In addition, pumping to CBCC would require new conveyance infrastructure and significant energy costs due to the higher elevation. Finally, per discussion with County staff, treatment of Clallam Bay-Sekiu wastewater by WSDOC would be opposed by the community. Because of these issues, treatment of Clallam Bay-Sekiu wastewater at an expanded CBCC WWTP is not recommended.

ALTERNATIVES EVALUATION

The capital costs, operations costs, and 20-year life cycle costs for each alternative are listed in Table 7-13. The relative operational costs summarized in Table 7-13 include only the electrical operational costs, since it is assumed that the maintenance, chemical, labor, and biosolids handling would be equivalent for each of the alternatives.

TABLE 7-13

Cost Estimates for WWTP Alternatives

Alternative	Capital Cost
Alternative 1: Modification/Expansion of Both Facilities	$19,510,000
Alternative 2A: Clallam Bay Activated RBC	$21,947,000
Alternative 2B: Clallam Bay Conventional Activated Sludge	$25,528,000
Alternative 2C: Clallam Bay Oxidation Ditch	$24,370,000
Alternative 3A: Upland WWTP Conventional Activated Sludge	$29,357,000
Alternative 3B: Upland WWTP Oxidation Ditch	$27,334,000

Each of the six wastewater treatment alternatives was evaluated based on a list of criteria encompassing a variety of economic, environmental, and non-monetary considerations. The eight criteria used for this comparative analysis are listed below.

1. Capital Cost
2. Operating Costs
3. Operational Complexity
4. Reliability
5. Environmental Benefits
6. Flexibility for Expansion
7. Resilience
8. Aesthetics/Visibility

The six wastewater treatment alternatives were rated on a scale of 1 (poor) to 10 (excellent) for each of the criteria listed above. The criteria were weighted from 1 (lowest) to 10 (highest) in importance, with cost and operation & maintenance criteria receiving the highest weighting. The results of this analysis, and a brief description of the criteria, are presented in Table 7-14.

Based on the evaluation and ratings, the two upland WWTP alternatives scored highest. These alternatives scored the highest based on the ability to operate a single plant at a location out of the flood plain, out of the tsunami zone, and out of the landslide zone. The site and WWTP layout could be readily expanded to accommodate CBCC wastewater, if the Department of Corrections were to discontinue use of the CBCC WWTP. Alternative 3B, the upland oxidation ditch WWTP, the highest scoring alternative, is further developed later in this chapter. In addition, Alternative 1 is further developed, given the differential in capital costs, and the economic hardship in the community, and lack of rate-payers.

TABLE 7-14

Relative Criteria Ratings for WWTP Alternatives

	Criteria	Goal	Importance Score (1 to 10)	Weighted Importance %	Alternative 1: Modification/ Expansion of Both Facilities		Alternative 2A: Clallam Bay Activated RBC		Alternative 2B: Clallam Bay Conventional Activated Sludge		Alternative 2C: Clallam Bay Oxidation Ditch		Alternative 3A: Upland WWTP Conventional Activated Sludge		Alternative 3B: Upland WWTP Oxidation Ditch	
					Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
1	Capital Cost	Minimize capital cost	10	20.8%	10	2.08	6	1.25	5	1.04	4	0.83	2	0.42	3	0.63
2	Operating Costs	Minimize O&M cost (e.g., energy, transportation cost, labor, etc.)	10	20.8%	4	0.83	5	1.04	5	1.04	6	1.25	4	0.83	6	1.25
3	Operational Complexity	Minimize challenges for operational procedures and monitoring requirements	3	6.3%	6	0.38	5	0.31	4	0.25	5	0.31	4	0.25	5	0.31
4	Reliability	Minimize risk that process may fail or need frequent or complex maintenance	4	8.3%	4	0.33	5	0.42	5	0.42	6	0.50	4	0.33	5	0.42
5	Environmental Benefits	Provide high quality effluent with minimal consumption of energy	5	10.4%	4	0.42	6	0.63	6	0.63	6	0.63	6	0.63	6	0.63
6	Flexibility for Expansion	Maximize flexibility of new infrastructure to fit into potential future treatment plans (incl. regionalization with CBCC)	6	12.5%	1	0.13	2	0.25	3	0.38	3	0.38	10	1.25	10	1.25
7	Resilience	Ability to withstand disasters, including floods, tsunamis, landslides and earthquakes	7	14.6%	2	0.29	3	0.44	3	0.44	3	0.44	9	1.31	9	1.31
8	Aesthetics/Visibility	Limit visual and odor impact of WWTP	3	6.3%	3	0.19	4	0.25	4	0.25	4	0.25	5	0.31	5	0.31
TOTAL			**48**	**100%**		**4.65**		**4.58**		**4.44**		**4.58**		**5.33**		**6.10**

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FINAL TWO ALTERNATIVES – DETAILED DISCUSSION

The section below describes the final two alternatives in more detail.

ALTERNATIVE 1 – UPGRADE EXISTING PLANT OPTION

Alternative 1 has the lowest capital cost over the other alternatives, and only slightly higher operating costs. The County is familiar with the operation of RBC WWTPs, which is the current mode operation.

The WWTP expansions would be designed to comply with the requirements of a Class 2 reliability classification per the DOE design criteria. The proposed WWTP upgrade site plans for the Clallam Bay and Sekiu WWTPs were shown in Figure 7-11 and Figure 7-12, respectively. The proposed WWTP upgrade process flow diagrams for the Clallam Bay and Sekiu WWTPs are provided in Figures 7-15 and Figure 7-16, respectively.

Each of the process components are described generally below and the detailed design criteria for each component is summarized in Tables 7-15 and 7-16 at the end of this section.

HEADWORKS

For both WWTPs, new headworks structures would be constructed near the existing headworks structure. This structure would be a cast-in-place concrete structure incorporating several components to reduce the project footprint and reduce project costs by utilizing common wall construction. The headworks would have a below-grade footing and would have a higher top of wall elevation than the existing headworks to accommodate the higher design flows and additional downstream components.

The new WWTP headworks structure would include the following components:

1. Influent flow meters
2. Influent sampler
3. Concrete influent channel head box
4. Concrete influent channels with new mechanically cleaned fine screen and bypass manual bar screen
5. Aerated grit chamber and grit removal cleaning system
6. Concrete primary clarifier flow diversion box.

The primary clarifier flow diversion structure is discussed in the following sections. The other headworks components are discussed below.

A head box would be installed at the upstream end of the influent channel, which would consist of a section of channel with a higher wall height to prevent splashing of the high

velocity pumped influent above the top of the channel and a straight run of horizontal channel to provide quiescent flow prior to the flow meter. Immediately downstream of the headbox, a parshall flume would be constructed to measure influent flow.

The influent channel would split into two parallel channels downstream of the head box, one channel would be the primary channel and be equipped with a new mechanical fine screen and the other channel would be the bypass channel equipped with a manually cleaned fine screen that would serve as a redundant backup unit. The mechanical fine screen would have a perforated in-channel screen basket with 6-mm perforations, a spiral assembly, transport tube, press zone assembly, discharge section, drive system, pivot stand and control. The screen shall be self-cleaning and would include a washing mechanism and compaction zone to minimize the screenings volume, which would be transported to the top of the assembly and drop into a new screw conveyor. The screw conveyor would transport the dewatered screenings from the screen to a dumpster located at grade next to the headworks. When the system is in "Auto" mode, the screen would be started automatically when the flow level in the channel rises to the adjustable set point in the ultrasonic level controller, or by an adjustable override timer which is set through the PLC. The manual screen would have 3/8-inch openings.

A new influent sampler would be used for flow proportional sampling from the channel downstream of the influent screens.

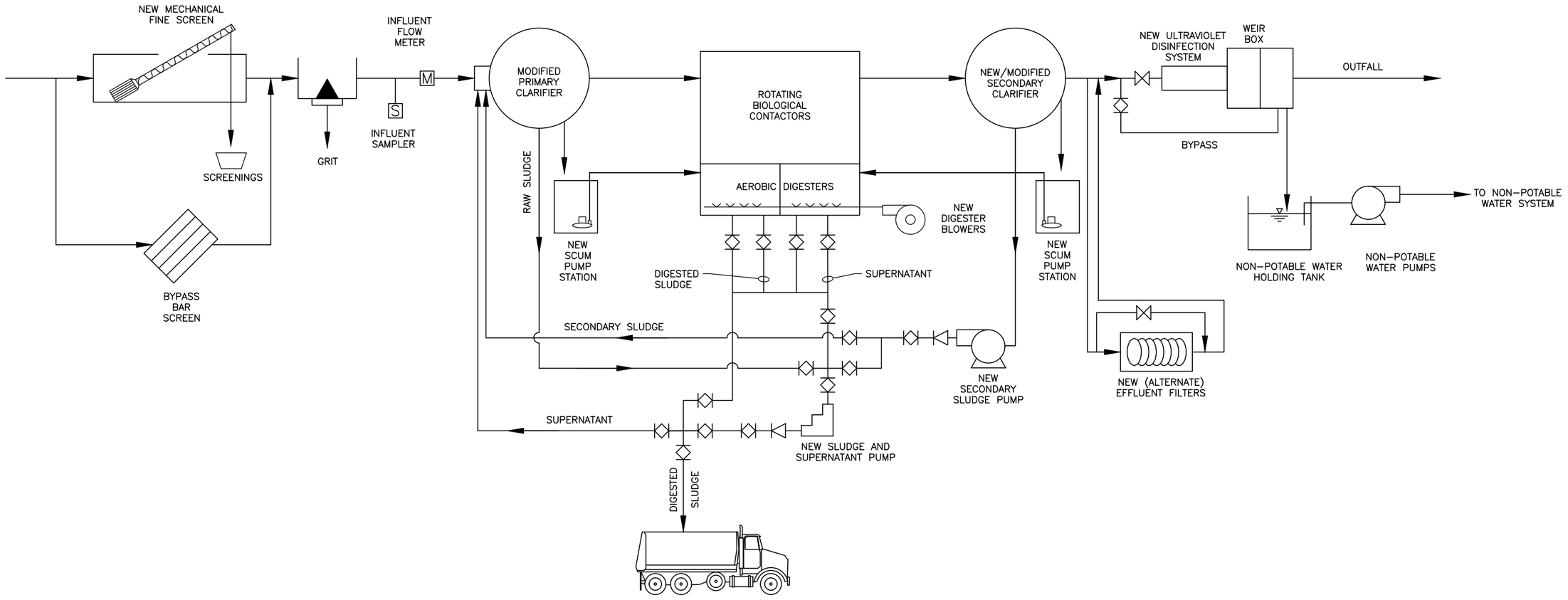
The aerated grit chamber would be downstream of the influent screen channels and would be equipped with a coarse air diffuser along one side of the basin to induce a spiral pattern of flow through the chamber. As the wastewater passes along the bottom of the chamber and begins moving vertically along the aerated wall, grit falls into a trough where it is collected by a cross collector screw and drops into a sump containing the submersible grit pump. The grit pump would discharge to a grit hydrocyclone/classifier for removal from the wastewater. The separated grit would drop from the grit classifier outlet into a dumpster located at grade. The grit blower and grit pump would be equipped with VFD drives to allow them to be tuned for optimal grit removal.

PRIMARY CLARIFIER FLOW DIVERSION STRUCTURE

A new primary clarifier flow diversion structure would be constructed near the existing headworks structure. This structure would convey flow from the headworks to the primary clarifiers. At times of peak flow, a portion of the flow would go over a weir directly to the RBCs. Stop gates would be provided to allow operators to isolate the primary clarifier for service.

PRIMARY CLARIFIERS

The existing primary clarifiers would be rehabilitated with all new equipment including bridge structure, drives, and weirs. The clarifiers would have an energy dissipating inlet (EDI) well within a center feed well and effluent weirs located around the perimeter of



CLALLAM COUNTY

CLALLAM BAY/SEKIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 7-15

PROPOSED PROCESS FLOW DIAGRAM, CLALLAM BAY, ALTERNATIVE 1

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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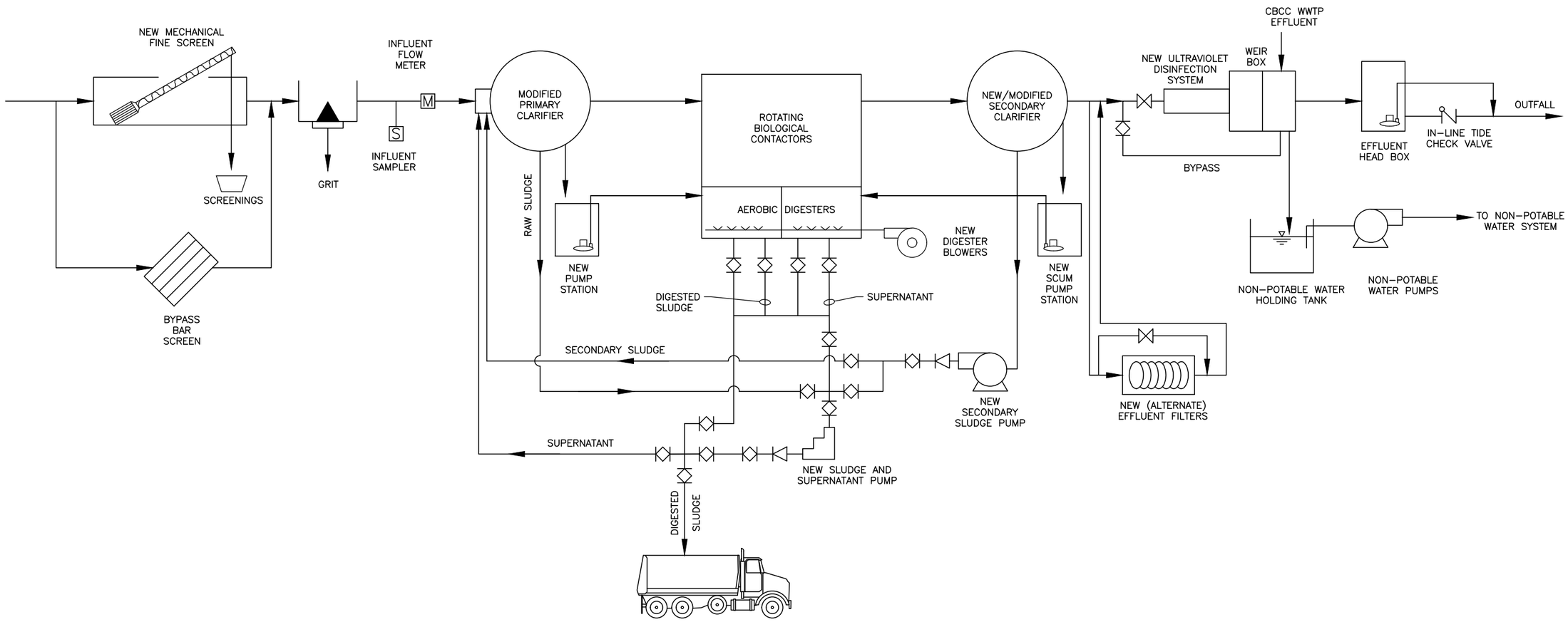


CLALLAM COUNTY

CLALLAM BAY/SEKIU GENERAL SEWER/ WASTEWATER FACILITIES PLAN

FIGURE 7-16

PROPOSED PROCESS FLOW DIAGRAM, SEKIU, ALTERNATIVE 1

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\CLALLAMCO\18486 CLALLAM BAY SEKIU GSP WWFP\FIGURES\E-PFD_FIG_7-X.DWG

the basin. The central EDI would be equipped with outlet vanes designed to improve settling efficiency by directing flow tangentially outward within the influent feed well. Influent flow would then pass down under the feed well and into the clarifier basin. The effluent weirs would be located on new concrete launders. Stamford baffles would be added to the outside wall to prevent upward wall currents and short circuiting.

A new concrete scum pit would be constructed adjacent to the exterior wall of each secondary clarifier. Scum would be pumped out of the scum pit to the sludge holding tank by new scum pumps.

A non-potable water pipe and several spray nozzles would be installed along the clarifier walkway to help direct clarifier surface scum towards the scum box.

Settled sludge would be collected using spiral scrapers which would push the sludge toward the center of the basin. A scum skimmer along with a scum beach and trough would also be provided for the collection and removal of surface scum.

The clarifier drive mechanism would be outfitted with anew motor and torque overload protection.

ROTATING BIOLOGICAL CONTACTOR EQUIPMENT REPLACEMENT

The existing primary RBCs would be outfitted with new drive motors and gear reducers. New sheaves drive belts, and safety guards would be furnished. In addition, the RBCs would be modified by replacing the existing shaft bearings and installing new load cells to monitor the mass of the biofilm on the RBC media.

SECONDARY CLARIFIER SPLITTER BOX

A new secondary clarifier splitter box would be constructed at each WWTP. The secondary clarifier splitter box would receive flow from the RBCs and split the flow to the secondary clarifiers. The splitter box would be cast in place concrete with fabricated metal weirs for flow control.

SECONDARY CLARIFIERS

The existing secondary clarifier at Clallam Bay would be rehabilitated with all new equipment including bridge structure, drives, and weirs. The walls of the existing clarifier would be elevated above the flood elevation.

One new secondary clarifier would be constructed at Clallam Bay and would be 22 feet in diameter.

Two new 30-foot diameter secondary clarifiers would be constructed at Sekiu. The existing secondary clarifier at Sekiu could be retrofitted for use as an effluent filtration basin (if needed).

The new clarifiers would have a 13-foot side water depth, an energy dissipating inlet (EDI) well within a center feed well, and effluent weirs located around the perimeter of the basin. The central EDI would be equipped with outlet vanes designed to improve settling efficiency by directing flow tangentially outward within the influent feed well. Influent flow would then pass down under the feed well and into the clarifier basin. The effluent weirs would be located on new concrete launders.

A new concrete scum pit would be constructed adjacent to the exterior wall of each pair of secondary clarifiers. Scum would be pumped out of the scum pit to the sludge holding tank by new scum pumps.

A non-potable water pipe and several spray nozzles would be installed along the clarifier walkways to help direct clarifier surface scum towards the scum box.

Settled sludge would be collected using spiral scrapers which would push the sludge toward the center of the basin. A scum skimmer along with a scum beach and trough would also be provided for the collection and removal of surface scum.

The secondary clarifier designs would meet the Reliability Class 2 requirement that the units shall be sufficient in number and size so that, with one unit out of service, the remaining units shall have flow capacity of at least 50 percent of the total design flow for each WWTP.

UV DISINFECTION SYSTEM

A new ultraviolet (UV) effluent disinfection would be installed at each WWTP and used for effluent disinfection. The UV disinfection systems would be a new packaged, horizontal, low-pressure, low-intensity system that is comprised of two banks of UV lamps located in stainless steel vessels at each WWTP. The system would be capable of delivering a design dose of 30,000 $\mu Wsec/cm^2$ at a transmittance of 40 percent (at a wavelength of 253.7 nm) at maximum day flow. Based on experience at other WWTPs, this dose is sufficient to produce an average monthly coliform count of less than 200 per 100 mL sample. One bank would be designed to provide this level of disinfection. An additional UV bank would be included for redundancy.

A finger weir at the outlet of the channel would control the level in the channel, ensuring that the recommended water level range is maintained in the UV channel during all flow conditions.

At the Sekiu WWTP, the existing UV Disinfection System Building would be reused. At Clallam Bay, the existing UV Disinfection System Building would be modified to be

elevated above the flood elevation and the new UV Disinfection System would be placed inside.

NON-POTABLE WATER PUMP STATION

The existing non-potable water system at the Sekiu WWTP would be replaced. New instrumentation and controls would be provided. The 430-gallon hydropneumatic tank would be replaced in-kind with a new unit. The pumps would be replaced with centrifugal pumps with a capacity of 60 gpm at 140 feet.

The existing non-potable water system at the Clallam Bay WWTP is located within the floodplain. The existing building would be modified to be located above the flood plain. New instrumentation and controls would be provided. The 430-gallon hydropneumatic tank would be replaced in kind with a new unit. The pumps would be replaced with centrifugal pumps with a capacity of 60 gpm at 140 feet.

EFFLUENT FILTER

At the Sekiu WWTP, due to the effect of high I/I reducing influent BOD and TSS concentrations, the actual effluent BOD and TSS concentrations required to meet the 85 percent removal requirements are such that effluent filtration may be needed.

For effluent filtration, vertically mounted cloth media discs with a backwash system would be used. The filter tank would also have a hopper-bottom and solids removal system. For this application, pile filter cloth would be used. The filter tank would be covered to avoid exposure to bright sunlight, commonly causing excessive algae growth in the effluent filters.

It should be noted that if influent I/I is reduced, the need for effluent filtration has the potential to be eliminated.

EFFLUENT FLOW MEASUREMENT AND SAMPLING

A new effluent magnetic flow meter would be installed on the piping downstream of the UV disinfection system. The effluent flow meter would measure the real time flow rate of the effluent flow from the facility at all times.

An effluent sampler would be used for flow proportional sampling from the effluent downstream of the UV disinfection system. The sampler would be an automated and refrigerated sampler.

SLUDGE HOLDING TANK AERATION SYSTEM

The existing aerobic digesters are not expected to be capable of producing Class B biosolids in the design year, so they are referred to as Sludge Holding Tanks.

The existing systems at each WWTP have two dedicated blowers and associated coarse bubble diffusion systems. The aeration blowers, piping, and valves would be replaced in-kind.

SLUDGE TRANSFER PUMP

A new sludge transfer pump would be installed at each WWTP. This pump would have new suction and discharge piping connections to allow it to transfer sludge from the sludge holding tanks to sludge haul truck. The pumps would be progressing cavity pumps with a capacity of 300 gpm at 30 psi.

EQUIPMENT BUILDING MODIFICATIONS

The equipment building housing the sludge holding tank aeration system and the sludge transfer pump would be equipped with new siding, roof, and paint at the Sekiu WWTP. At the Clallam Bay WWTP, a new building would be constructed with a floor elevation located above the flood elevation.

PLANT DRAIN PUMP STATION

At the Clallam Bay WWTP, the walls of the existing Plant Drain Pump Station would be extended to be above the flood elevation. The pumps would be replaced with submersible centrifugal pumps on guide rails that are removable without entering the pump station. The pump station would be equipped with a submersible level sensor, and a float switch for level control. Check valves and isolation-plug valves for these pumps would be located in a below-grade vault adjacent to the manhole. The plant drain pump station would receive flow from the various plant drains and would pump to the new headworks influent channel downstream of the influent sampler.

OPERATIONS BUILDING

The Operations Building at Sekiu would be modified to incorporate new electrical and instrumentation systems as described in a following section. In addition, the Operations Building at Sekiu would be outfitted with new siding, roof, and paint.

A new Operations Building would be constructed at the Clallam Bay WWTP. The floor elevation would be located above the flood elevation. The design approach for the Operations Building is to create a simple layout to house all of the functional requirements. The operations building would have a laboratory, office, restroom/locker room, control room/library, conference/lunch room, mechanical room, and electrical room.

The floor would be concrete slab on grade. Exterior wall structure would be 12-inch thick insulated concrete masonry units for durability, low maintenance, and energy

efficiency. Interior walls would be 8-inch concrete masonry for durability. Partition walls at the crew area (office, laboratory, restrooms, etc.) may be stud and gypsum wall board construction. Doors and frames would be hollow metal (steel). Exterior windows would be dark bronze anodized aluminum, thermal break type with double pane.

Exterior CMU walls would be a combination of split face and smooth face textures in earth tone colors. The upper portion of the exterior walls would be clad with a steel siding board and batten configuration in a dark bronze color. The sloped roof would be steel for durability and low maintenance. The roof configuration would be corrugated or standing seam.

ELECTRICAL SERVICE

Due to the age of the of the existing motor control centers (MCCs) at both WWTPs, it is recommended that the existing MCCs be removed and replaced with new equipment. During the design of this upgrade, the circuit breaker sizes would be coordinated following appropriate code standards. The MCCs supplying power to motor-driven equipment would be provided with run-time meters and ammeters in the MCC.

STANDBY POWER

During design of the upgrades to the WWTPs, the existing generators would be load-tested and checked for proper operation by an appropriate service provider. It is expected that they would be able to be reused in the upgraded WWTPs

PROCESS CONTROLS AND TELEMETRY

A status and alarm reporting computer (HMI) would be located in the office of the Operations Building at each WWTP. The HMI would display status (i.e., "run" and "fail") of the motor driven equipment.

In the event of a major alarm condition, an alarm horn mounted on the Operations Building would sound for a period of two minutes. If the alarm is not acknowledged within this time period, the HMI and/or an electromechanical auto-dialer would call the appropriate maintenance personnel as designated by the County.

OUTFALL

The impacts of this alternative on the existing gravity outfalls at the existing WWTPs are discussed in this section.

Sekiu

Under this alternative, the outfall at Sekiu would not have sufficient capacity to convey the flow from the Sekiu WWTP and the CBCC WWTP via gravity. The outfall would

need to be pressurized. Pressurizing the outfall would be accomplished by pumping the combined Sekiu WWTP and WSDOC effluent. A check valve would be added to the outfall pipe near the outfall structure that would allow the combined effluent to flow by gravity for the majority of the time. At flows above peak day flow, the effluent would need to be pumped. The pumps would discharge downstream of the check valve and pressurize the force main. The effluent pumps would be duplex, submersible pumps located in an adjacent wet well structure.

Clallam Bay

Under this alternative, the existing Clallam Bay gravity outfall can continue operation as a gravity outfall since it has sufficient capacity.

SUMMARY OF DESIGN CRITERIA

Table 7-15 and Table 7-16 present a summary of the design criteria for the upgrades to the Clallam Bay WWTP and the Sekiu WWTP, respectively.

TABLE 7-15

Clallam Bay WWTP Design Criteria Summary Table

Design Criteria	
Design Influent Flow	
Annual Average	0.039 mgd
Maximum Month	0.068 mgd
Peak Day	0.150 mgd
Peak Hour	0.444 mgd
Design Influent BOD_5	
Annual Average	61 lb/d
Maximum Month	89 lb/d
Design Influent TSS	
Annual Average	54 lb/d
Maximum Month	96 lb/d
Headworks (New)	
Influent Flow Meters	
Quantity	1
Type	Parshall Flume
Size	3-inch throat
Mechanical Fine Screens	
Quantity	1
Type	Helical Basket
Size	20 inch
Orifice Type	0.25 inch
Drive Motor	2 hp

TABLE 7-15 – (continued)

Clallam Bay WWTP Design Criteria Summary Table

Headworks (New) – (continued)	
Aerated Grit Basin	
Quantity	1
Tank Dimensions (L x W x D)	12 ft x 4 ft x 6 ft
Detention Time @ Peak Hour Flow	7 minutes
Grit Cyclone Separator	
Quantity	1
Cyclone Capacity	220 gpm
Grit Aeration Blower	
Quantity	1
Type	Positive Displacement
Air Flow	30 scfm
Air Discharge Pressure	6 psi(g)
Motor	3 hp
Grit Pump	
Quantity	1
Type	Submersible Recess Impeller
Capacity	220 gpm @ 27' TDH
Motor	Max. 7.5 hp
Grit Cross Collector	
Quantity	1
Grit Screw Diameter	10 inch
Motor	1.5 hp
Primary Clarifier (Existing, Upgraded)	
Quantity	1
Type	Circular, Center Feed – Perimeter Withdrawal
Diameter	18 ft
Effective Settling Area, Each	254 ft^2
Effective Side Water Depth	9 ft
Surface Overflow Rate @ Design AAF	153 gpd/ft^2
Surface Overflow Rate @ Design MMF	267 gpd/ft^2
Surface Overflow Rate @ Design PHF	1,745 gpd/ft^2
Detention Time @ Design AAF	9.7 hrs
Detention Time @ Design MMF	5.7 hrs
Detention Time @ Design PHF	0.9 hrs
Weir Length of Each Clarifier	113 ft
Weir Loading @ Design PHF	3,928 gpd/ft
Drive Motor Size	0.5 hp

TABLE 7-15 – (continued)

Clallam Bay WWTP Design Criteria Summary Table

Primary Scum Pump (New)	
Quantity	1
Type	Submersible, non-clog centrifugal
Capacity, each	100 gpm
Motor	5 hp
Primary Sludge Pump (New)	
Quantity	1
Type	Rotary Lobe
Capacity, each	40 gpm @ 30 psi
Motor	5 hp
Rotating Biological Contactors	
Quantity	2
Media Area	50,000 ft^2
Stages	2
Drive Motor	3 hp
Gear Reducer	Dodge No. 188C
Secondary Clarifier 1 (Existing, Upgraded)	
Quantity	1
Type	Circular, Center Feed – Perimeter Withdrawal
Diameter	18 ft
Effective Settling Area, Each	254 ft^2
Effective Side Water Depth	9 ft
Surface Overflow Rate @ Design AAF	153 gpd/ft^2
Surface Overflow Rate @ Design MMF	267 gpd/ft^2
Surface Overflow Rate @ Design PHF	1,745 gpd/ft^2
Detention Time @ Design AAF	9.7 hrs
Detention Time @ Design MMF	5.7 hrs
Detention Time @ Design PHF	0.9 hrs
Weir Length of Each Clarifier	113 ft
Weir Loading @ Design PHF	3,928 gpd/ft
Drive Motor Size	0.5 hp
Effective Settling Area, Each	254 ft^2
Secondary Clarifier 2 (New)	
Quantity	1
Type	Circular, Center Feed – Perimeter Withdrawal
Diameter	22 ft
Effective Settling Area, Each	254 ft^2
Effective Side Water Depth	13 ft
Surface Overflow Rate @ Design AAF	153 gpd/ft^2
Surface Overflow Rate @ Design MMF	267 gpd/ft^2
Surface Overflow Rate @ Design PHF	1,745 gpd/ft^2

TABLE 7-15 – (continued)

Clallam Bay WWTP Design Criteria Summary Table

Secondary Clarifier 2 (New) – (continued)	
Detention Time @ Design AAF	22.4 hrs
Detention Time @ Design MMF	13.3 hrs
Detention Time @ Design PHF	2.1 hrs
Weir Length of Each Clarifier	113 ft
Weir Loading @ Design PHF	3,928 gpd/ft
Drive Motor Size	0.5 hp
Effective Settling Area, Each	254 ft^2
Secondary Sludge Pump (New)	
Quantity	1
Type	Rotary Lobe
Capacity, each	40 gpm @ 30 psi
Motor	5 hp
Sludge Transfer Pump (New)	
Quantity	1
Type	Progressing Cavity
Capacity, each	300 gpm @ 30 psi
Motor	15 hp
UV Disinfection System	
Number of Channels	1
Number of Banks	2
Capacity, one bank out of service	0.07 mgd (MMF)
Capacity, all banks in service	0.14 mgd (PDF)
Design UV Transmittance (min)	50%
Design Dose	30 mJ/cm^2
Effluent Disinfection Standard	200 cfu/100 mL
Non-Potable Water System (New)	
Quantity of Pumps	2
Type	Centrifugal
Capacity	60 gpm @ 140 ft
Motor	3 hp
Hydropneumatic Tank Capacity	430 gallons
Effluent Flow Meter (New)	
Quantity	1
Type	Magnetic
Size	8-inch
Sludge Holding Tanks	
Quantity	2
Basin Dimensions	12’x14’x8’
Volume	2,720 CF
Blowers (New)	
Quantity	2
Capacity	140 SCFM @ 3 psi

TABLE 7-15 – (continued)

Clallam Bay WWTP Design Criteria Summary Table

Sludge Holding Tanks – (continued)	
Motor	5 hp
Plant Drain Pump Station (New)	
Quantity of Pumps	2
Type	Submersible Centrifugal
Capacity	75 gpm @ 25 ft
Motor	3 hp
Emergency Power Generator	
Quantity	1
Capacity	50 kW
Fuel	Diesel, 50 gallons storage

TABLE 7-16

Sekiu Design Criteria Summary Table

Design Criteria	
Design Influent Flow	
Annual Average	0.072 mgd
Maximum Month	0.161 mgd
Peak Day	0.624 mgd
Peak Hour	1.50 mgd
Design Influent BOD_5	
Annual Average	74 lb/d
Maximum Month	197 lb/d
Design Influent TSS	
Annual Average	47 lb/d
Maximum Month	147 lb/d
Headworks (New)	
Influent Flow Meters	
Quantity	1
Type	Parshall Flume
Size	6-inch throat
Mechanical Fine Screens	
Quantity	1
Type	Helical Basket
Size	20 inch
Orifice Type	0.25 inch
Drive Motor	2 hp
Aerated Grit Basin	
Quantity	1
Tank Dimensions (L x W x D)	14 ft x 6 ft x 10 ft
Detention Time @ Peak Hour Flow	6 minutes

TABLE 7-16 – (continued)

Sekiu Design Criteria Summary Table

Headworks (New) – (continued)	
Grit Cyclone Separator	
Quantity	1
Cyclone Capacity	220 gpm
Grit Aeration Blower	
Quantity	1
Type	Positive Displacement
Air Flow	30 scfm
Air Discharge Pressure	6 psi(g)
Motor	3 hp
Grit Pump	
Quantity	1
Type	Submersible Recess Impeller
Capacity	220 gpm @ 27' TDH
Motor	Max. 7.5 hp
Grit Cross Collector	
Quantity	1
Grit Screw Diameter	10 inch
Motor	1.5 hp
Primary Clarifier (Existing, Upgraded)	
Quantity	1
Type	Circular, Center Feed – Perimeter Withdrawal
Diameter	22 ft
Effective Settling Area, Each	254 ft^2
Effective Side Water Depth	9 ft
Surface Overflow Rate @ Design AAF	190 gpd/ft^2
Surface Overflow Rate @ Design MMF	242 gpd/ft^2
Surface Overflow Rate @ Design PHF	1,200 gpd/ft^2, partial flow to RBC
Detention Time @ Design AAF	7.9 hrs
Detention Time @ Design MMF	3.7 hrs
Detention Time @ Design PHF	0.4 hrs
Weir Length of Each Clarifier	138 ft
Weir Loading @ Design PHF	3,619 gpd/ft, partial flow to RBC
Drive Motor Size	0.5 hp
Primary Scum Pump (New)	
Quantity	1
Type	Submersible, non-clog centrifugal
Capacity, each	100 gpm
Motor	5 hp
Primary Sludge Pump (New)	
Quantity	1
Type	Rotary Lobe
Capacity, each	40 gpm @ 30 psi

TABLE 7-16 – (continued)

Sekiu Design Criteria Summary Table

Primary Sludge Pump (New) – (continued)	
Motor	5 hp
Rotating Biological Contactors	
Quantity	2
Media Area	165,000 ft^2
Stages	2
Drive Motor	3 hp
Gear Reducer	Dodge No. 188C
Secondary Clarifiers (New)	
Quantity	2
Type	Circular, Center Feed – Perimeter Withdrawal
Diameter	30 ft
Effective Settling Area, Each	1414 ft^2
Effective Side Water Depth	13 ft
Surface Overflow Rate @ Design AAF	44 gpd/ft^2
Surface Overflow Rate @ Design MMF	114 gpd/ft^2
Surface Overflow Rate @ Design PHF	1,061 gpd/ft^2
Detention Time @ Design AAF	29.5 hrs
Detention Time @ Design MMF	13.7 hrs
Detention Time @ Design PHF	1.5 hrs
Weir Length of Each Clarifier	188 ft
Weir Loading @ Design PHF	7,962 gpd/ft
Drive Motor Size	0.5 hp
Effective Settling Area, Each	707 ft^2
Secondary Sludge Pump (New)	
Quantity	1
Type	Rotary Lobe
Capacity, each	40 gpm @ 30 psi
Motor	5 hp
Sludge Transfer Pump (New)	
Quantity	1
Type	Progressing Cavity
Capacity, each	300 gpm @ 30 psi
Motor	15 hp
UV Disinfection System	
Number of Channels	1
Number of Banks	2
Capacity, one bank out of service	0.158 mgd (MMF)
Capacity, all banks in service	0.54 mgd (PDF)
Design UV Transmittance (min)	50%
Design Dose	30 mJ/cm^2
Effluent Disinfection Standard	200 cfu/100 mL

TABLE 7-16 – (continued)

Sekiu Design Criteria Summary Table

Non-Potable Water System (New)	
Quantity of Pumps	2
Type	Centrifugal
Capacity	60 gpm @ 140 ft
Motor	3 hp
Hydropneumatic Tank Capacity	430 gallons
Effluent Flow Meter (New)	
Quantity	1
Type	Magnetic
Size	10-inch
Sludge Holding Tanks	
Quantity	2
Basin Dimensions	15.5'x14'x10'
Volume	4,400 CF
Blowers (New)	
Quantity	2
Capacity	275 SCFM @ 3 psi
Motor	7.5 hp
Effluent Pump Station (New)	
Quantity of Pumps	2
Type	Submersible Centrifugal
Capacity	1,550 gpm @ 35 ft
Motor	30 hp
Plant Drain Pump Station (New)	
Quantity of Pumps	2
Type	Submersible Centrifugal
Capacity	75 gpm @ 25 ft
Motor	3 hp
Emergency Power Generator	
Quantity	1
Capacity	50 kW
Fuel	Diesel, 50 gallons storage

ALTERNATE 3B – UPLAND OXIDATION DITCH WWTP

This section provides a detailed discussion of Alternative 3B, the upland oxidation ditch WWTP. As shown in Table 7-14, 3B was the highest scoring alternative, based on the ability to operate a single plant at a location out of the flood plain, out of the tsunami zone, and out of the landslide zone, and the ability to be readily expanded to accommodate CBCC wastewater, if the Department of Corrections were to discontinue use of the CBCC WWTP.

The WWTP would be designed to meet the requirements of a Class 2 reliability classification per Ecology design criteria. The proposed WWTP upgrade site plan is shown in Figure 7-14.

This alternative is readily expandable to receive and treat flows from CBCC.

Each of the process components are described generally below and the detailed design criteria for each component is summarized in Table 7-17 at the end of this Section.

LOCATION OF NEW UPLAND WWTP

Viable sites for the new Upland WWTP would be located outside of the critical areas taking geologic, flood, and tsunami hazards into account. This section discusses the considerations for siting the New Upland WWTP in Sekiu and alternatively, in Clallam Bay.

Clallam Bay Upland WWTP Site

Viable sites zoned as Urban Center are located in the Clallam Bay area. Figure 7-17 presents areas located outside of the critical areas. One of the significant disadvantages for locating the New Upland WWTP is conveyance of flow from Sekiu to the new WWTP. Two alternatives are considered for conveying flow from Sekiu to Clallam Bay.

<u>Conveyance from Sekiu to Clallam Bay Upland WWTP Site – Overland</u>

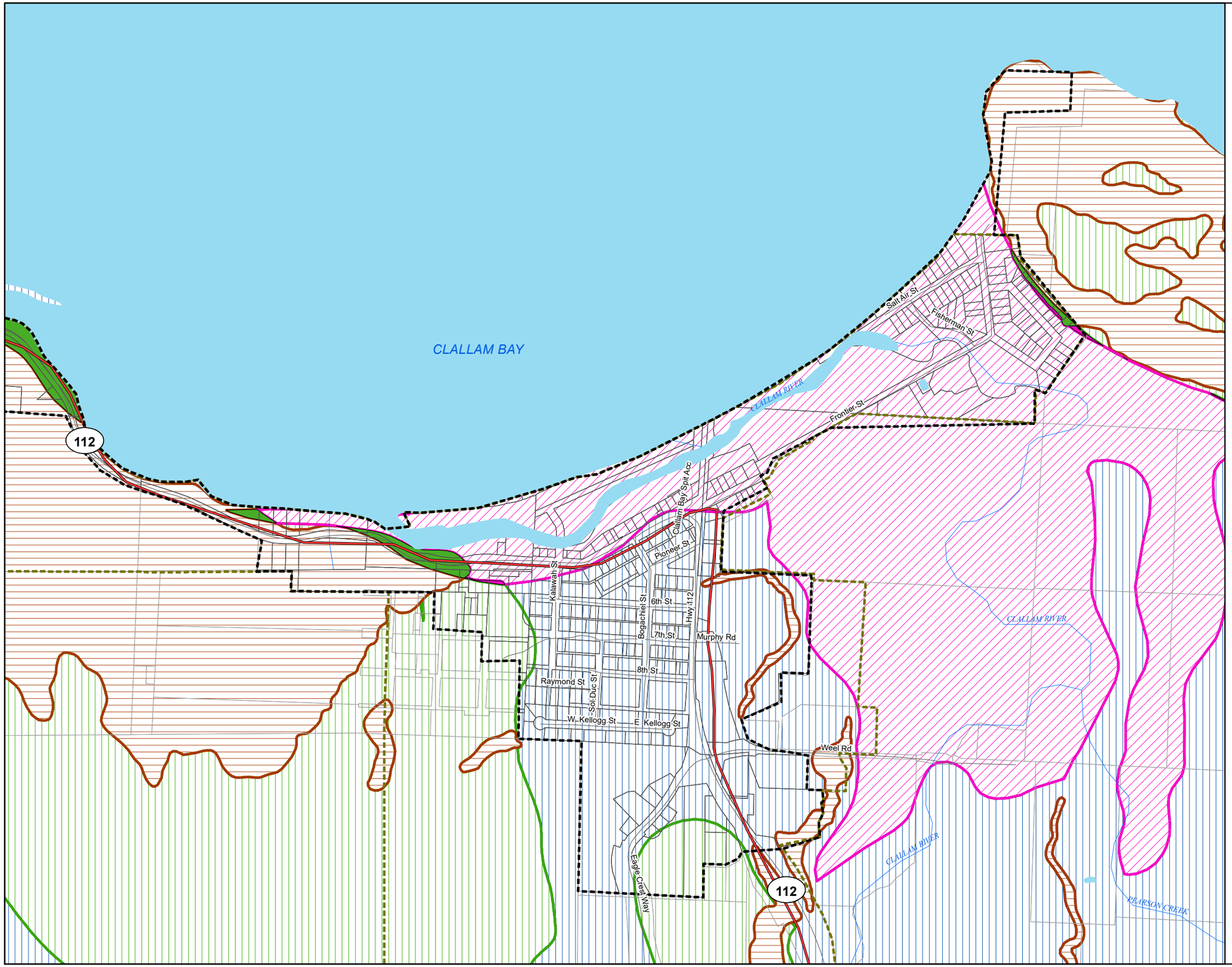
One option for conveying flow from Sekiu to a new upland WWTP located in Clallam Bay would be to convey flow overland past the CBCC to the new Upland Clallam Bay WWTP. This alternative would route the flow from Sekiu uphill in the new CBCC back road to the top of the hill at Eagle Crest Way in a new force main. The wastewater would then flow downhill in Eagle Crest Way in new gravity lines. Due to the elevation gained going this route, an intermediate pump station would need to be constructed along the alignment. In addition, new gravity lines would need to be constructed in Eagle Crest way. The estimated additional cost to route the wastewater overland would be approximately $4,000,000.

<u>Conveyance from Sekiu to Clallam Bay Upland WWTP Site – Highway 112</u>

One option for conveying flow from Sekiu to a new upland WWTP located in Clallam Bay would be to construct improvements to the existing Sekiu Lift Station and install new parallel force mains in Highway 112 from Sekiu to Clallam Bay.

Sekiu Upland WWTP Site

Viable sites zoned as Urban Center are located in the Sekiu area. Figure 7-18 presents potential areas located outside of the critical areas. One option for conveying flow from



N

0 375 750 1,500 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE
- UGA BOUNDARY
- PARCEL
- WATERBODY

GEOLOGIC HAZARD

- EROSION HAZARD
- LANDSLIDE HAZARD
- SEISMIC HAZARD
- LANDSLIDE HAZARD / SEISMIC HAZARD
- EROSION HAZARD / SEISMIC HAZARD
- AREA OUTSIDE OF GEOLOGIC HAZARD AREAS / POTENTIAL UPLAND SITE

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 7-17
POTENTIAL SITES FOR NEW UPLAND WWTP IN CLALLAM BAY

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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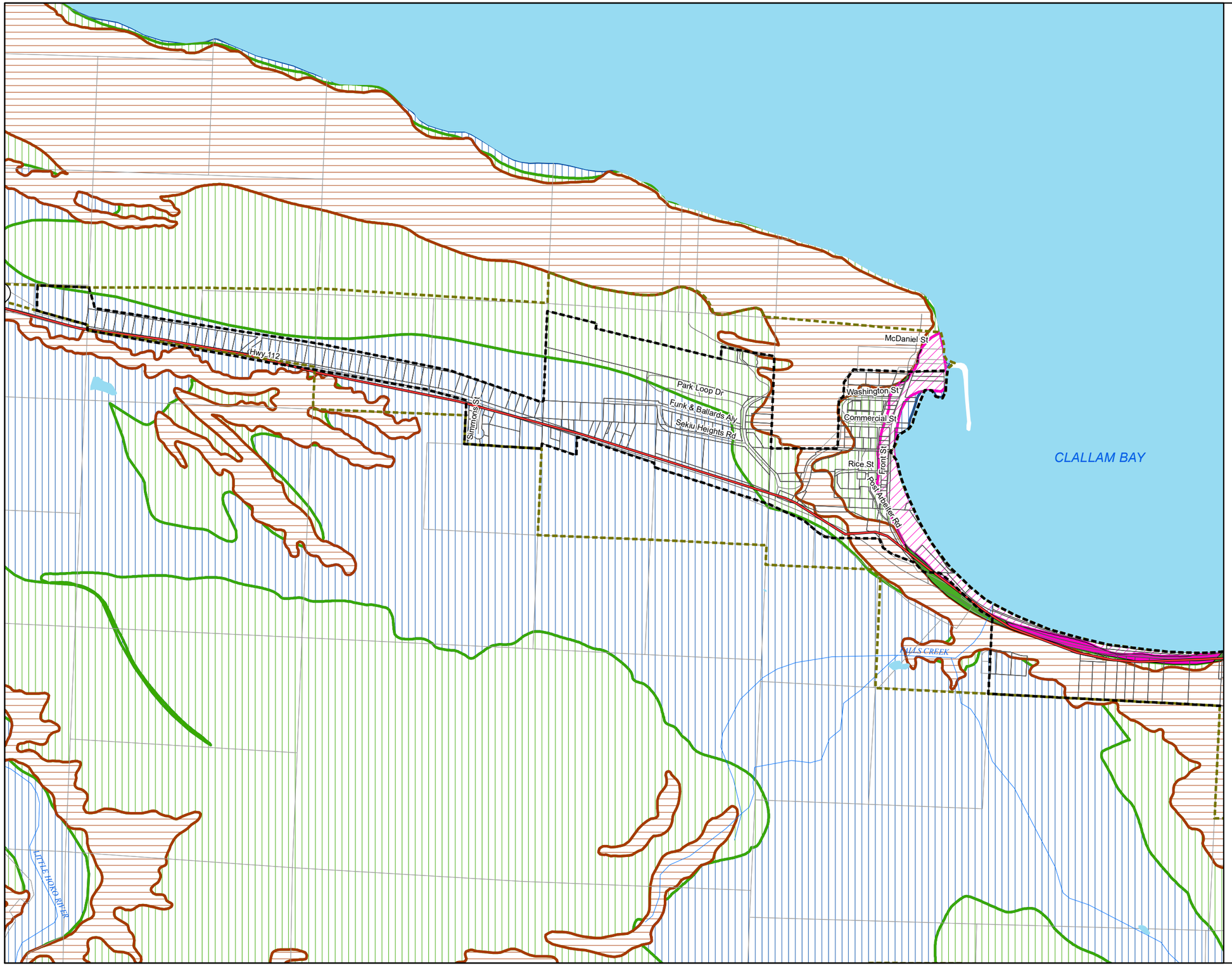

N

0 550 1,100 2,200 Feet

LEGEND

- REGIONAL HIGHWAY
- ROAD
- RIVER
- CURRENT SEWER SERVICE
- UGA BOUNDARY
- PARCEL
- WATERBODY

GEOLOGIC HAZARD

- EROSION HAZARD
- LANDSLIDE HAZARD
- SEISMIC HAZARD
- LANDSLIDE HAZARD / SEISMIC HAZARD
- EROSION HAZARD / SEISMIC HAZARD
- AREA OUTSIDE OF GEOLOGIC HAZARD AREAS / POTENTIAL UPLAND SITE

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 7-18
POTENTIAL SITES FOR NEW UPLAND WWTP IN SEKIU

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\FIG7-18_UPLANDSITES.mxd

Clallam Bay to Sekiu to a new upland WWTP located in Sekiu would be to construct improvements to the existing Clallam Bay Lift Station and install new parallel force mains in Highway 112 from Sekiu to Clallam Bay. One positive consideration for this alternative is that it would be relatively easy to connect the CBCC to the New Upland WWTP for wastewater treatment.

It is recommended that the location of the New Upland WWTP is in Sekiu. It has the advantage of a lower capital cost, ease of connecting potential future flows from CBCC, and lower peak flows from Clallam Bay. The opinion of probably construction cost for Alternative 3B, New Upland WWTP using an oxidation ditch treatment process is based on locating the New Upland WWTP in the Sekiu region.

HEADWORKS

A new headworks structure would be constructed. This structure would be a cast-in-place concrete structure incorporating several components to reduce the project footprint and reduce project costs by utilizing common wall construction. The headworks would have a below grade footing.

The new WWTP headworks structure would include the following components:

1. Influent flow meter.
2. Automatic refrigerated influent sampler.
3. Concrete influent channel head box.
4. Concrete influent channels with new mechanically cleaned fine screen and bypass manual bar screen.
5. Aerated grit chamber and grit removal and cleaning system

The headworks components are discussed below.

A head box would be installed at the upstream end of the influent channel, which would consist of a section of channel with a higher wall height to prevent splashing of the high velocity pumped influent above the top of the channel and a straight run of horizontal channel to provide quiescent flow prior to the flow meter. Immediately downstream of the headbox, a parshall flume would be constructed to measure influent flow.

The influent channel would split into two parallel channels downstream of the head box, one channel would be the primary channel and be equipped with a new mechanical fine screen and the other channel would be the bypass channel equipped with a manually cleaned fine screen that would serve as a redundant backup unit. The mechanical fine screen would have a perforated in-channel screen basket with 6-mm perforations, a spiral assembly, transport tube, press zone assembly, discharge section, drive system, pivot stand and control. The screen would be self-cleaning and would include a washing mechanism and compaction zone to clean the screenings and minimize the screenings volume, which would be transported to the top of the assembly and drop into a new screw

conveyor. The screw conveyor would transport the dewatered and washed screenings from the screen to a dumpster located at grade next to the headworks. When the system is in "Auto" mode, the screen would be started automatically when the flow level in the channel rises to the adjustable set point in the ultrasonic level controller, or by an adjustable override timer which is set through the PLC. The manual screen would have 3/8-inch openings. The manual screen can be replaced with a mechanical fine screen to increase the capacity of the headworks to be able to receive flows from the CBCC.

The aerated grit chamber would be constructed integrally to the headworks, located immediately downstream of the influent screen channels and would be equipped with a coarse air diffuser along one side of the basin to induce a spiral pattern of flow through the chamber. As the wastewater passes along the bottom of the chamber and begins moving vertically along the aerated wall, grit falls into a trough where it is collected by a cross collector screw and drops into a sump containing the submersible grit pump. The grit pump would discharge to a grit hydrocyclone/classifier. The hydrocyclone/classifier washes and dewaters the grit. The grit would drop from the grit classifier outlet into a dumpster located at grade. The aerated grit basin grit blower and grit pump would be equipped with VFD drives to allow them to be tuned for optimal grit removal.

An automated, refrigerated, influent sampler would be used for flow proportional sampling from the channel downstream of the aerated grit chamber.

BIOLOGICAL SELECTORS

After passing through the aerated grit chamber, the screened and degritted influent wastewater would be mixed with return activated sludge (RAS) in the biological selectors. The selectors are reactors that are designed to create conditions that would favor the growth of floc-forming bacteria over filamentous bacteria, thereby producing sludge with good settling characteristics. The theory behind the use of biological selectors to control the growth of filamentous organisms is linked to bacterial kinetics. Due to their high surface to mass ratio, filamentous bacteria are able to more efficiently utilize soluble substrate at lower concentrations than are the non-filamentous bacteria. Therefore, if the food-to-microorganism (F/M) ratio (BOD_5 to active biomass) is low, which is generally the case with oxidation ditches, filamentous bacteria would be favored over floc-forming bacteria, leading to the development of poorly settling sludge. Conversely, although floc-forming are less efficient under low F/M conditions, they have a higher maximum specific growth rate than filamentous bacteria at high F/M conditions. Consequently, if the available substrate (BOD_5) concentration is relatively high, conditions would favor floc-forming bacteria and filamentous bulking is less likely to occur. Therefore, selector zones would be utilized to create conditions that favor floc-forming bacteria.

When sizing selector zones, care must be taken to ensure that the F/M ratio is not too high. If the initial contact loadings are too high, viscous or non-filamentous bulking may occur, rendering the selector zones ineffective. Based on past experience, the selector

zones would be sized to produce an F/M ratio of 6 lbs BOD_5/lb MLSS*d in selector one, and an F/M ratio of 3 lbs BOD_5/lb MLSS*d in the combined selector one and two volume.

A bypass would be provided around the selectors. This bypass would be used while performing maintenance on the selectors.

Each of the selectors would be equipped with a one-horsepower mechanical mixer that would allow the solids to be kept in suspension. A local safety disconnect switch and an "on-off" selector switch would be mounted adjacent to each mixer. Each mixer would be provided with over-temperature switches wired in series with the motor control circuitry to disable the mixers in the event of motor over-temperature. Alarm conditions and mixer status would be monitored by the PLC and reported to the HMI.

OXIDATION DITCH

Biological oxidation of organic materials and nitrogen in the influent wastewater would be achieved in an oxidation ditch, which is an extended aeration process in where the bacterial mass is continuously pumped around an oval concrete basin. The basin is generally mechanically mixed and aerated.

As is the case with most treatment processes, oxidation ditches are typically sized based on the solids retention time (SRT) that is required to achieve the desired level of treatment, i.e., oxidation of organic matter and nitrification of ammonia. Although oxidation of ammonia is not presently required by regulatory agencies for the existing wastewater treatment facilities, the accepted typical design criteria for this process would result in virtually complete oxidation of ammonia to nitrate (nitrification).

Being an extended aeration process, oxidation ditches are typically designed with a hydraulic retention time (HRT) of between 18 to 30 hours and a solids retention time in the range of 15 to 30 days. At these long HRTs and SRTs the microorganisms are generally considered to be operating in their endogenous growth phase. In the endogenous phase the microorganisms consume their own protoplasm because the concentration of food in the bulk liquid is low. During this phase, a phenomenon known as cell lysis occurs. Cell lysis refers to a condition in which nutrients from dead cells diffuse into the bulk liquid where they can be hydrolyzed and consumed by the living cells for food. In the endogenous phase there is not enough food available to support all of the microorganisms present. The microorganisms, therefore, compete very actively for the available food, utilizing their own cell mass for food as necessary. This highly competitive and self-destructive phase produces a highly treated effluent while also resulting in relatively low sludge production.

Oxidation Ditch Sizing

Oxidation ditch capacity requirements are dependent on three major design criteria. These criteria are: solids retention time (SRT), net heterotrophic and autotrophic yields, and design mixed liquor solids (MLSS) concentration. It is recommended that the oxidation ditch activated sludge system be designed to achieve nitrification in accordance with generally accepted design criteria for these types of systems. (The equations used in this analysis are from *Wastewater Engineering Treatment and Reuse*, Metcalf & Eddy, 4th ed.) The net specific growth rate of the nitrifying biomass is an order of magnitude lower than that of the carbon oxidizing bacteria and is, therefore, used as the basis for determining the design SRT of the oxidation ditch.

The first step is to calculate the maximum specific nitrifier growth rate ($\mu_{n,m}$), decay rate (k_{dn}) and ammonia half saturation coefficient (K_N) at the winter design temperature of 7 degrees C for the oxidation ditch using the following equations.

$\mu_{n,m,7} = (\mu_{n,m}) \times (\theta^{t-20}) = (0.9/d) \times (1.072^{7-20}) = 0.365/d$

$K_{N,7} = (K_{N,m}) \times (\theta^{t-20}) = (0.7\ mg/l) \times (1.053^{7-20}) = 0.358\ mg/l$

$k_{dn,7} = (k_{dn,m}) \times (\theta^{t-20}) = (0.17\ mg/l) \times (1.029^{7-20}) = 0.117\ mg/l$

The numerical values for the various parameters above are typical for domestic wastewater.

Although effluent limits for ammonia are not included in the current NPDES permit, the oxidation ditch would be designed to nitrify (remove ammonia), in accordance with the generally accepted design criteria.

Assuming an effluent NH_3-N (N) of 1 mg/L, a dissolved oxygen concentration (DO) of 2.0 mg/L and an oxygen half saturation coefficient (K_O) of 0.5 mg/L, we can calculate the actual nitrifier growth rate as follows:

$$\mu_n = \left(\mu_{n,\max,7^0}\right)\left(\frac{N}{K_N + N}\right)\left(\frac{DO}{K_O + DO}\right) - k_{dn} = \left(0.365/d\right)\left(\frac{1.0}{0.358+1.0}\right)\left(\frac{2}{0.5+2}\right) - 0.117$$

This yields a net specific nitrifier growth rate of 0.098/d, which is then used to calculate the required SRT using the following equation.

$SRT = 1/\mu_n = 1/0.098 = 10.2$ days

Applying a safety/peaking factor of 1.5 to this value produces a design oxidation ditch SRT of 15.3 days. For design purposes, an SRT of 16 days would be used.

In order to calculate the total aerobic mass required for the design SRT, the net sludge production for the treatment system must first be estimated. Assuming a cell yield of 0.4 lb VSS/lb biodegradeable COD (bCOD), an influent wastewater and biomass VSS/TSS ratio of 0.85, a design temperature of seven degrees C, the total sludge production can be determined using the following equation.

$$P_X = \left[\frac{(Y)(S - S_0)}{(1 + (k_{d,t})(SRT))0.85}\right] + \left[\frac{(f_d)(k_d)(Y)(S - S_0)(SRT)}{(1 + (k_{d,t})(SRT))0.85}\right] + \left[\frac{(Y_n)(NO_x)}{(1 + (k_{dn,t})(SRT))0.85}\right] + X_{iVSS} + X_{iTSS}$$

Where:

P_X = mass of waste activated sludge per day, lb/d (to be determined)
Y = heterotrophic cell yield = 0.40 lb/lb bCOD (typical for domestic wastewater)
Y_n = autotrophic cell yield = 0.12 lb/lb TKN (typical for domestic wastewater)
S = mass of influent bCOD, typically 1.6 x influent BOD_5 = 458 lbs/d
S_0= mass of effluent bCOD, typically 1.6 x effluent BOD_5 = 48 lb/d
f_d = fraction of cell mass remaining as cell debris = 0.15 lb/lb (typical for domestic wastewater)
$k_{d,t}$ = endogenous heterotrophic decay coefficient, day^{-1} (see below)
$k_{dn,t}$ = endogenous nitrogenous decay coefficient, day^{-1} (see below)
SRT = solids retention time of the SRT = 16 days
X_{iVSS} = volatile nonbiodegradable solids, typically 0.2 x influent TSS = 49 lb/d
X_{iTSS} = influent nonvolatile suspended solids, typically 0.2 x influent TSS = 49 lb/d
t =oxidation ditch minimum temperature = 7 degrees C
NO_x = amount of influent TKN oxidized to nitrate, typically 80 percent of assumed influent TKN = 0.8 x 57 = 46 lbs/day

The values for k_d and k_{dn} can be determined as follows.

$$k_{d,7^0} = (k_{n,\max})(\theta^{t-20}) = (0.12/d)(1.04^{7-20}) = 0.072/d \text{ (typical for domestic wastewater)}$$

$$k_{dn,7^0} = (k_{n,\max})(\theta^{t-20}) = (0.17/d)(1.029^{7-20}) = 0.117/d \text{ (typical for domestic wastewater)}$$

The sludge production is calculated.

This yields a total estimated waste sludge production of 195 lbs per day. At the design aerobic SRT of 16 days, this results in a required total aerobic mass of 3,120 lbs. At a design MLSS concentration of 2,500 mg/l, the volume of the oxidation ditch can be determined as follows:

Volume = 3,120 lbs/(2,500mg/l x 8.34 lbs/gal) = 0.150 MG = <u>150,000 gallons</u>

Provisions would be made to expand the treatment process with a new ditch using common wall construction and stubouts, if CBCC wastewater were to be treated in the future.

Aeration Requirements

The total oxygen requirement for the oxidation ditch is determined below. (The equations used in this analysis are from *Wastewater Engineering Treatment and Reuse*, Metcalf & Eddy, 4th ed.)

Carbonaceous O_2 Demand= $S - S_0 - 1.42(P_{x,bio})$

Where:

$$P_{x,bio} = 0.85 \times (P_x - X_{iVSS} - X_{iTSS}) = 0.85 \times (195 \text{ lb/d} - 49 \text{ lb/d} - 49 \text{ lb/d}) = 83 \text{ lb/d}$$

Carbonaceous O_2 Demand = *(410 lb/d) – 1.42(83 lb/d) = 292 lb/d*

Nitrogenous O2 Demand: Need to first determine amount of nitrogen oxidized to nitrate = NOx = influent TKN – effluent ammonia – 0.12 Px,bio

NOx = 57 lbs/d – (1.0 mg/l) x (0.229 MGD) x (8.34 lbs/gal) – 0.12 x 83 lbs/d
=45 lbs/d

Nitrogenous O_2 Demand = *4.33 x NO_x = 4.33 x 45 lbs/d = 195 lbs/d*

Total O_2 Demand = *Carbonaceous O_2 Demand + Nitrogenous O_2 Demand*
= 292 lbs/d + 195 lbs/d = 487 lbs/d

Applying a safety factor of 1.3 to this value to account for diurnal fluctuations, the design oxygen demand can be determined.

Design Total O_2 Demand = *(1.3 P. F.) (487 lb/d)*
= 633 lb/d

This demand represents the oxygen that has to be transferred under "standard conditions," which is the aeration of tap water at sea level at a temperature of 20 degrees C and a DO concentration of 0 mg/l. Oxygen transfer is considerably less efficient at a summer temperature of 25ºC, and maintaining a DO of 2 mg/l in the oxidation ditch.

The standard oxygen requirement (SOTR) is calculated based on the basin side water depth, MLSS concentration, operating dissolved oxygen concentration and site elevation and has the following simplified relationship for this system:

$$AOTR = (0.3)(SOTR) \rightarrow SOTR = 633/0.3 = 2{,}110 \text{ lb/d}$$

The resulting standard oxygen requirement is 2,110 lb/d. Assuming an average transfer efficiency of 2.0 percent per foot of water depth, or 22.4 percent at a diffuser depth of 10.0 feet (normal operating depth), the following equation is used to calculate the peak air demand:

$$AirDemand = \left(\frac{SOTR \ lb/d}{(lbO_2 / ft^3 air)(E)(1440 \min/d)} \right)$$

This formula results in a total peak air demand of 425 standard cubic feet per minute (scfm) for the oxidation ditch. The brush rotors would be equipped with variable frequency drives to allow the speed to vary with the oxygen demand. The oxidation ditch would be equipped with dissolved oxygen meters for the control system operation of the rotor speed. The meters would be used in an oxygen feedback control loop. The dissolved oxygen setpoint would be operator adjustable at the HMI.

Local controls for the brush rotors would include a local disconnect switch, a "hand-off-auto" (HOA) selector switch, and a speed potentiometer mounted adjacent to the respective motor. Under normal operation, the HOA switch would be placed in the "auto" position. When the switch is placed in the "hand" position, the brush rotor would operate and the rotor speed would be adjusted manually by the speed potentiometer. Each motor would be provided with over-temperature switches wired in series with the motor control circuitry to disable the rotors in the event of motor over temperature. Rotor status and alarm conditions would be monitored by the PLC and displayed at the HMI.

SECONDARY CLARIFIER SPLITTER BOX

A secondary clarifier splitter box would be provided. The secondary clarifier splitter box would receive flow from the oxidation ditch and split the flow to the secondary clarifiers. The splitter box would be cast in place concrete with fabricated metal weirs for flow control. The splitter box would be constructed with provisions for future expansion (e.g., to accommodate the possibility of receiving CBCC flows in the future).

SECONDARY CLARIFIERS

Two new 38-foot diameter secondary clarifiers would be constructed. The new clarifiers would have a 13-foot side water depth, an energy dissipating inlet (EDI) well within a center feed well, and effluent weirs located around the perimeter of the basin. The central EDI would be equipped with outlet vanes designed to improve settling efficiency by directing flow tangentially outward within the influent feed well. Influent flow would

then pass down under the feed well and into the clarifier basin. The effluent weirs would be located on new interior concrete launders.

A new concrete scum pit would be constructed adjacent to the exterior wall of each pair of secondary clarifiers. Scum would be pumped out of the scum pit to the sludge holding tank by new scum pumps.

A non-potable water pipe and several spray nozzles would be installed along the clarifier walkways to help direct clarifier surface scum towards the scum box.

Settled sludge would be collected using spiral scrapers which would push the sludge toward the center of the basin. A scum skimmer along with a scum beach and trough would also be provided for the collection and removal of surface scum.

The secondary clarifier designs would meet the Reliability Class 2 requirement that the units shall be sufficient in number and size so that, with one unit out of service, the remaining units shall have flow capacity of at least 50 percent of the total design flow.

UV DISINFECTION SYSTEM

A new ultraviolet (UV) effluent disinfection system would be installed and used for effluent disinfection. The UV disinfection system would be a new packaged, horizontal, low-pressure, low-intensity system that is comprised of two banks of UV lamps located in a stainless steel vessel at the WWTP. The system would be capable of delivering a design dose of 30,000 µWsec/cm^2 at a transmittance (at a wavelength of 253.7 nm) of 55 percent at maximum day flow to ensure compliance with the average monthly coliform limit of 200 per 100 mL sample. One bank would be designed to provide this level of disinfection. An additional UV bank would be included for redundancy.

A finger weir at the outlet of the channel would control the level in the channel, ensuring that the recommended water level range is maintained in the UV channel during all flow conditions.

NON-POTABLE WATER PUMP STATION

A new non-potable water pump station would be constructed and furnished with new instrumentation and controls. A hydropneumatic tank would be utilized in combination with new non-potable water centrifugal pumps with a capacity of 150 gpm at 140 feet TDH. The non-potable water system would supply water to the influent screen spray bar, the grit classifier, the clarifier spray bars, and a number of yard hydrants located around the treatment facility for wash down.

EFFLUENT FILTER

Due to the effect of high I/I reducing influent BOD and TSS concentrations, the actual effluent BOD and TSS concentrations required to meet the 85 percent removal requirements are such that effluent filtration may be needed.

Vertically mounted cloth media discs with a backwash system would be used. The filter tank would also have a hopper-bottom and solids removal system. For this application, pile filter cloth would be used. The filter tank would be covered to avoid exposure to bright sunlight, commonly causing excessive algae growth in the effluent filters.

It should be noted that if influent I/I is reduced, the need for effluent filtration has the potential to be eliminated.

EFFLUENT FLOW MEASUREMENT AND SAMPLING

A new effluent magnetic flow meter would be installed on the piping downstream of the UV disinfection system. The effluent flow meter would measure the real time flow rate of the effluent flow from the facility at all times.

An effluent sampler would be used for flow proportional sampling from the effluent downstream of the UV disinfection system. The sampler would be an automated and refrigerated sampler.

SLUDGE HOLDING TANK

A new sludge holding tank would be constructed in this alternative consistent with the current operating configuration of hauling liquid sludge. The new sludge holding tank would have a 12,000-gallon capacity. The sludge holding tanks would have two dedicated blowers and associated coarse bubble diffusion systems.

SLUDGE TRANSFER PUMP

A new sludge transfer pump would be installed at the WWTP. This pump would have new suction and discharge piping connections to allow it to transfer sludge from the sludge holding tanks to a sludge haul truck. The pumps would be progressing cavity pumps with a capacity of 300 gpm at 30 psi.

PLANT DRAIN PUMP STATION

A new Plant Drain Pump Station would be constructed in this alternative. The pumps would be submersible centrifugal pumps on guide rails that are removable without entering the pump station. The pump station would be equipped with a submersible level sensor, and a float switch for level control. Check valves and isolation-plug valves for these pumps would be located in a below-grade vault adjacent to the manhole. The plant

drain pump station would receive flow from the various plant drains and would pump to the new headworks influent channel downstream of the influent sampler and flow meter.

OPERATIONS BUILDING

A new Operations Building would be constructed. The design approach for the Operations Building is to create a simple layout to house all of the functional requirements. The operations building would have a laboratory, office, restroom/locker room, control room/library, conference/lunch room, mechanical room, and electrical room.

The floor would be concrete slab on grade. Exterior wall structure would be 12-inch thick insulated concrete masonry units for durability, low maintenance, and energy efficiency. Interior walls would be 8-inch concrete masonry for durability. Partition walls at the crew area (office, laboratory, restrooms, etc.) may be stud and gypsum wall board construction. Doors and frames would be hollow metal (steel). Exterior windows would be dark bronze anodized aluminum, thermal break type with double pane.

Exterior CMU walls would be a combination of split face and smooth face textures in earth tone colors. The upper portion of the exterior walls would be clad with a steel siding board and batten configuration in a dark bronze color. The sloped roof would be steel for durability and low maintenance. The roof configuration would be corrugated or standing seam.

ELECTRICAL SERVICE

New three-phase 480-volt electrical power would be provided under this alternative. The circuit breaker sizes would be coordinated following appropriate code standards. The MCCs supplying power to motor-driven equipment would be provided with run-time meters and ammeters in the MCC.

STANDBY POWER

A new diesel generator would be installed to provide emergency power to the new WWTP.

PROCESS CONTROLS AND TELEMETRY

A status and alarm reporting computer (HMI) would be located in the office of the Operations Building. The HMI would display status (i.e., “run” and “fail”) of the motor driven equipment.

In the event of a major alarm condition, an alarm horn mounted on the Operations Building would sound for a period of two minutes. If the alarm is not acknowledged

within this time period, the HMI and/or an electromechanical auto-dialer would call the appropriate maintenance personnel as designated by the County.

OUTFALL

The impacts of this alternative on and the fate of the existing gravity outfalls at the two existing WWTPs are discussed in this section.

Sekiu Outfall

Under this alternative, the configuration of the outfall is highly dependent on the selected location of the New Upland WWTP. If the New Upland WWTP is located in Sekiu, there would be sufficient static head to utilize the existing Sekiu outfall with some minor modifications. The tributary gravity effluent piping would be sealed to allow static pressure head to build to an elevation of approximately 30 feet. If the New Upland WWTP is located in Clallam Bay the existing Sekiu outfall would continue to serve as the CBCC WWTP outfall and any piping from the existing Sekiu WWTP would be plugged.

Clallam Bay

Under this alternative, the configuration of the outfall is highly dependent on the selected location of the New Upland WWTP. If the New Upland WWTP is located in Sekiu, the existing Clallam Bay outfall would be decommissioned and abandoned in place. The outfall piping would be plugged at the manhole closest to the water. If the New Upland WWTP is located in Clallam Bay it is likely that the outfall would need to be pressurized. However, this would be dependent on the actual site selected. Pressurizing the outfall would be accomplished by pumping the combined Sekiu and Clallam Bay effluent. A check valve would be added to the outfall pipe near the outfall structure that would allow the combined effluent to flow by gravity for the majority of the time. At flows above peak day flow, the effluent would need to be pumped. The pumps would discharge downstream of the check valve and pressurize the force main. The effluent pumps would be duplex, submersible pumps located in an adjacent wet well structure.

SUMMARY OF DESIGN CRITERIA

Table 7-17 presents a summary of the design criteria for the upgrades to proposed new upland WWTP.

TABLE 7-17

New Upland WWTP Design Criteria Summary Table

Design Criteria	
Design Influent Flow	
Annual Average	0.111 mgd
Maximum Month	0.229 mgd
Peak Day	0.774 mgd
Peak Hour	1.944 mgd
Design Influent BOD_5	
Annual Average	135 lb/d
Maximum Month	286 lb/d
Design Influent TSS	
Annual Average	101 lb/d
Maximum Month	243 lb/d
Headworks	
Influent Flow Meters	
Quantity	1
Type	Parshall Flume
Size	6-inch throat
Mechanical Fine Screens	
Quantity	1
Type	Helical Basket
Size	20 inch
Orifice Type	0.25 inch
Drive Motor	2 hp
Aerated Grit Basin	
Quantity	1
Tank Dimensions (L x W x D)	18 ft x 6 ft x 10 ft
Detention Time @ Peak Hour Flow	6 minutes
Grit Cyclone Separator	
Quantity	1
Cyclone Capacity	220 gpm
Grit Aeration Blower	
Quantity	1
Type	Positive Displacement
Air Flow	30 scfm
Air Discharge Pressure	6 psi(g)
Motor	3 hp
Grit Pump	
Quantity	1
Type	Submersible Recess Impeller
Capacity	220 gpm @ 27’ TDH

TABLE 7-17 – (continued)

New Upland WWTP Design Criteria Summary Table

Headworks – (continued)	
Motor	Max. 7.5 hp
Grit Cross Collector	
Quantity	1
Grit Screw Diameter	10 inch
Motor	1.5 hp
Secondary Clarifiers	
Quantity	2
Type	Circular, Center Feed – Perimeter Withdrawal
Diameter	38 ft
Effective Settling Area, Each	1,134 ft^2
Effective Side Water Depth	13 ft
Surface Overflow Rate @ Design AAF	127 gpd/ft^2
Surface Overflow Rate @ Design MMF	262 gpd/ft^2
Surface Overflow Rate @ Design PHF	1,114 gpd/ft^2
Detention Time @ Design AAF	37 hrs
Detention Time @ Design MMF	24 hrs
Detention Time @ Design PHF	2.7 hrs
Weir Length of Each Clarifier	239 ft
Weir Loading @ Design PHF	477 gpd/ft
Drive Motor Size	0.5 hp
Secondary Sludge Pump	
Quantity	1
Type	Rotary Lobe
Capacity, each	40 gpm @ 30 psi
Motor	5 hp
Sludge Transfer Pump	
Quantity	1
Type	Progressing Cavity
Capacity, each	300 gpm @ 30 psi
Motor	15 hp
UV Disinfection System	
Number of Channels	1
Number of Banks	2
Capacity, one bank out of service	0.230 mgd (MMF)
Capacity, all banks in service	0.774 mgd (PDF)
Design UV Transmittance (min)	55%
Design Dose	30 mJ/cm^2

TABLE 7-17 – (continued)

New Upland WWTP Design Criteria Summary Table

UV Disinfection System – (continued)	
Effluent Disinfection Standard	200 cfu/100 mL
Non-Potable Water System	
Quantity of Pumps	2
Type	Centrifugal
Capacity	150 gpm @ 140 ft
Motor	3 hp
Hydropneumatic Tank Capacity	430 gallons
Effluent Flow Meter	
Quantity	1
Type	Magnetic
Size	8-inch
Sludge Holding Tanks	
Quantity	2
Basin Dimensions	16'x12'x10'
Volume	1,900 CF
Blowers (New)	
Quantity	2
Capacity	140 SCFM @ 3 psi
Motor	5 hp
Plant Drain Pump Station	
Quantity of Pumps	2
Type	Submersible Centrifugal
Capacity	75 gpm @ 25 ft
Motor	3 hp
Emergency Power Generator	
Quantity	1
Capacity	250 kW
Fuel	Diesel, 500 gallons storage

WATER RECLAMATION AND REUSE EVALUATION

Per RCW 90.48.112, this Plan will evaluate the potential for reuse of reclaimed water. "Reclaimed Water" is defined in RCW 90.46.010 as "effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur, and is no longer considered wastewater."

Wastewater reuse can potentially be cost-effective by reducing demand for potable water by providing an environmental benefit, and by generating revenue by selling effluent to customers for use in irrigation and other non-potable uses. Reclaimed water may contain small amounts of nitrogen and phosphorus, which provide fertilizer when used for crop or turf irrigation. Standards concerning reuse of reclaimed water are discussed in Chapter 3 of this Plan.

POTENTIAL FOR WATER REUSE

The RCW 90.46 *Washington State Water Reclamation and Reuse Standards* describe several allowable beneficial uses for reclaimed water, including:

- Agricultural irrigation;
- Landscape irrigation;
- Groundwater recharge;
- Streamflow augmentation;
- Industrial and commercial uses; and
- Municipal uses.

Depending upon its end use, there are four categories of reclaimed water Class A, Class B, Class C, and Class D. Class A had the highest degree of effluent treatment. In general, when unlimited public access to the reclaimed water is involved or when irrigation or crops for human consumption is the intended end use, the criteria will require Class A reclaimed water.

The County has a limited number of options for beneficial use of reclaimed water for agricultural irrigation, streamflow augmentation, or industrial and commercial uses. The following alternatives were proposed and reviewed based on their potential for beneficial reuse:

- Alternative 1: Irrigation for the Clallam Bay School
- Alternative 2: Irrigation for Clallam Bay Correctional Center

A tertiary treatment system to treat effluent to Class A reclaimed water standards requires continuous filtration, oxidation and coagulation. In addition, a higher design UV disinfection dose is required to meet the more stringent fecal coliform requirements for reclaimed water. The conceptual design for the water reuse facility would therefore consist of additional coagulation and filtration using a new effluent disk filter and associated polymer addition system, followed by additional UV disinfection with required additional telemetry and alarms, and downstream storage and pumping systems. Note that emergency storage, for instances when the WWTP cannot meet Class A requirements, is not required since the WWTP can dispose of the effluent to the outfall at all times.

The reclaimed water distribution system components for each alternative are discussed below and a summary of the costs for each alternative is provided in Table 7-17.

Alternative 1: Irrigation for the Clallam Bay School

The Clallam Bay School has approximately 10.4 acres of lawns, football fields, and baseball fields. An irrigation demand of 2.67 feet per year (1 inch per week for the 12 weeks of summer and 0.5 inches per week for the remaining 40 weeks of the year) was assumed. At this water demand, the school would use about 11 million gallons per year for irrigation. A reclaimed water line would extend from the WWTP to the school. For planning purposes it is assumed that approximately 16,000 feet of 4-inch reclaimed water pipe would be required for this alternative.

Alternative 2: Irrigation for Clallam Bay Correctional Center

This alternative is not considered viable since historically the DOC has indicated that the use of reclaimed water at correctional facilities due to issues with inmate sensitivity.

Summary

Cost estimates, including the cost per CF over 20 years, for each alternative are summarized in Table 7-18.

TABLE 7-18

Cost Estimates for Reclaimed Water Distribution Pipeline

Alternative No.	Estimated Project Cost	Estimated Annual O&M Cost	Total Annual Cost(1)	Demand Per Year (CF)	Cost Per CF
1: Irrigation for the Clallam Bay School	$9,651,000	$30,000	$281,500	1,418,000	$0.20
2: Irrigation for Clallam Bay Correction Center	Not considered feasible.				

(1) Cost Per CF is calculated by dividing the estimated total annual cost by the demand over 20 years.

The current residential base cost of water per CF plus monthly connection charge with the County is $0.04103. The cost of reclaimed water production for Alternative 1 considered is significantly greater than the cost of purchasing water; therefore, the installation of a reclaimed water treatment and distribution system is not economically feasible until demand for the reclaimed water and/or the price of water rises sharply.

CHAPTER 8

CAPITAL IMPROVEMENT PROGRAM

INTRODUCTION

This chapter presents the Capital Improvement Plan (CIP) for the Sekiu and Clallam Bay sewer systems. Wastewater capital improvements have been identified and prioritized based on the system hydraulic analysis, lift station evaluation, regulatory requirements, component age, condition and reliability, operation and maintenance consideration, system benefit, and cost. For all proposed projects identified in this chapter, detailed preliminary project cost estimates are presented in Appendix F. Figures illustrating the locations of the proposed conveyance improvement project are included in Figures 8-1 through 8-4.

Other capital improvement projects may arise in the future that are not identified as part of the County's CIP presented in this chapter. Such projects may be deemed necessary for remedying an emergency situation, accommodating improvements resulting from land development, or addressing unforeseen problems with the County's wastewater system. Due to budgetary constraints, the construction of these projects may require changes in the proposed start date for projects in the CIP. When new information becomes available, the Plan should remain flexible to allow rescheduling, addition to, or deletion of proposed projects or to expand or reduce the scope of the projects, as best determined by the County. Each capital improvement project should be reevaluated to consider the most recent planning efforts as the proposed start date for the project approaches.

PROPOSED SYSTEM IMPROVEMENTS

The proposed system improvements in the CIP are described below. Each project cost estimate includes an 8.5 percent sales tax, a 20 percent construction contingency, 20 percent for engineering services, 12 percent for construction administration and 10 percent for legal, permitting and project administration. The asphalt restoration costs within the estimates include trench repair only. It should be noted that in some cases, an overlay may be required and the cost adjusted accordingly. All project costs are based on 2018 dollars with no adjustments made for inflation in future years.

SEWER SYSTEM CAPITAL IMPROVEMENTS

The gravity system improvements identified are generally designed to repair or replace aging sewer mains. Unless noted otherwise, for budgeting purposes, the cost estimates shown here assume open trench construction in existing right-of-way. The County should verify the method of construction during the predesign or design phase of these projects.

EXISTING GRAVITY MAINS

CIP 1 – I/I Repair Program

Replace 81 cleanout caps in Sekiu and Clallam Bay and provide additional CCTV for 3,475 feet in Sekiu along the Sekiu Airport Road Basin.

Estimated Project Cost: $152,000

CIP 2 – Funk & Ballard Pipe Repairs

Repair a 6-inch side sewer located north of MH 6.02 in Funk & Ballards, repair one misaligned side sewer connection west of MH 6.02, and provide a flexible coupling on disjointed PVC pipes downstream of MH 6.02.

Estimated Project Cost: $52,000

CIP 3 – Snob Hill LS Basin I/I and Pipe Improvements (Phase I)

Replace five sewer manholes that have infiltration possibilities due to gaps in the riser rings, holes within the manhole walls or failing grout.

Estimated Project Cost: $134,000

CIP 4 – Area Drain Disconnection

Disconnect area drain in school parking lot from the sanitary sewer and direct to a new infiltration trench west of the parking lot.

Estimated Project Cost: $58,000

CIP 5 – Middle Point LS Basin I/I and Pipe Improvements

Includes projects resulting from the CCTV inspection including: two side sewer replacements, two manhole replacements, and two new manholes associated with 120 LF of new pipe to replace the bend between MH 13.05 and MH 13.06.

Estimated Project Cost: $93,000

CIP 6 – Sekiu LS Basin I/I Improvements

Includes three manhole replacements which were projects resulting from the CCTV inspection.

Estimated Project Cost: $102,000

N

0 100 200 400 Feet

LEGEND

- CIP 1: Cleanout Replacements
- CIP 5: Middle Pt LS I/I Imp. (MH Repair)
- CIP 5: Middle Pt LS I/I Imp. (Spot Pipe Repair)
- CIP 5: Middle Pt LS I/I Imp. (Side Sewer Repair)
- L S CIP 15: Middle Point LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- Parcel
- UGA Boundary

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 8-1
CIPS 1, 5, 15
(MIDDLE POINT)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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N

Feet

0 100 200 400

LEGEND

- CIP 1: Cleanout Replacements
- CIP 1: I/I Repair Program (CCTV)
- CIP 6: Sekiu LS Basin I/I Imp. (MH Repair)
- CIP 6: Sekiu LS Basin I/I Imp. (Spot Pipe Repair)
- CIP 8: Sekiu LS Basin Pipe Replacements
- CIP 9: Sekiu Airport Rd Basin Pipe Replacements
- L S CIP 17: Sekiu LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- P S Pump station
- Sewer Treatment Plant
- Parcel
- UGA Boundary

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 8-2
CIPS 1, 6, 8, 9, 17
(SEKIU LS / SEKIU AIRPORT RD BASINS)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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LEGEND

- CIP 1: Cleanout Replacements
- CIP 1: I/I Repair Program (CCTV)
- CIP 2: Funk and Ballard Side Sewer Replacement
- CIP 2: Funk and Ballard Pipe Repairs (Side Sewer Repair)
- CIP 2: Funk and Ballard Pipe Repairs (Spot Pipe Repair)
- CIP 3: Snob Hill LS Basin I/I Impvts (Ph. I - MH Repair)
- CIP 9: Sekiu Airport Rd Basin Pipe Replacements
- CIP 10: Snob Hill LS Basin I/I and Pipe Impvt (Ph. II)
- CIP 11: West End LS Basin Pipe Replacements
- L S CIP 14: West End LS
- L S CIP 16: Snob Hill LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- Parcel
- UGA Boundary

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 8-3
CIPS 1, 2, 3, 9, 10, 11, 14, 16
(SNOB HILL LS / SEKIU AIRPORT RD./ WEST END LS BASINS)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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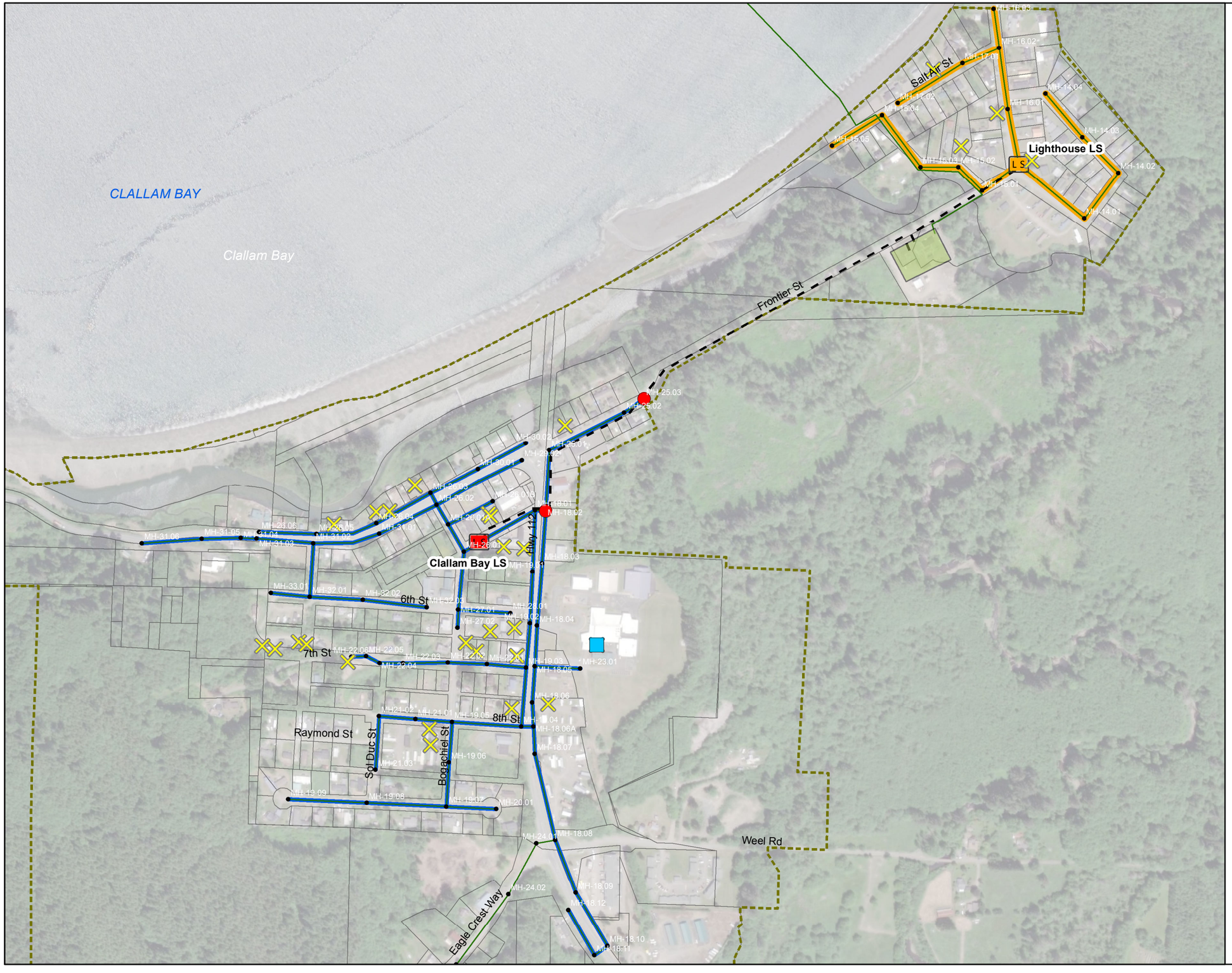

LEGEND

- CIP 1: Cleanout Replacements
- CIP 3: Disconnect Area Drain
- CIP 7: Clallam Bay I/I Impvt (MH Repair)
- CIP 12: Clallam Bay LS Basin Pipe Replacements
- CIP 13: Lighthouse LS Basin Pipe Replacements
- L S — CIP 19: Clallam Bay LS
- L S — CIP 20: Lighthouse LS
- Manhole
- Gravity Sewer Pipe
- Force Main
- P S — Pump station
- Sewer Treatment Plant
- Parcel
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 8-4
CIPS 1, 3, 7, 12, 13, 19, 20
(CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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CIP 7 - Clallam Bay I/I Improvements

Includes two manhole replacements which are projects resulting from field inspections.

Estimated Project Cost: $84,000

CIP 8 – Sekiu LS Basin Pipe Replacements

Includes replacing 3,340 LF of existing 8-inch concrete pipe with PVC pipe.

Estimated Project Cost: $1,619,000

CIP 9 – Sekiu Airport Road Basin Pipe Replacements

Includes replacing 1,340 LF of existing 8-inch concrete pipe with PVC pipe.

Estimated Project Cost: $790,000

CIP 10 – Snob Hill LS Basin I/I and Pipe Improvements (Phase II)

Includes replacing 4,745 LF 8-inch concrete pipe with 8-inch PVC pipe as well as 11 manholes.

Estimated Project Cost: $2,441,000

CIP 11 – West End LS Basin Pipe Replacements

Includes replacing 1,580 LF of existing 8-inch concrete pipe with PVC pipe.

Estimated Project Cost: $719,000

CIP 12 – Clallam Bay LS Basin Pipe Replacements

Includes replacing 13,665 LF of existing 8-inch concrete pipe with PVC pipe.

Estimated Project Cost: $6,072,000

CIP 13 – Lighthouse LS Basin Pipe Replacements

Includes replacing 3,680 LF of existing 8-inch concrete pipe with PVC pipe.

Estimated Project Cost: $1,685,000

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TABLE 8-1

Gravity System Capital Improvement Project Summary

Project CIP No.	Project Name	Project Description	Projected Year	Total Estimated Cost[(1)]
CIP 1	I/I Repair Program	Replace 81 cleanout caps in Sekiu and Clallam Bay and provide additional CCTV for 3,475 feet in Sekiu along the Sekiu Airport Road Basin.	2019	$52,000
CIP 2	Funk & Ballard Pipe Repairs	Repair 6-inch side sewer located north of MH 6.02 in Funk & Ballards, repair one misaligned side sewer connection west of MH 6.02, and provide a flexible coupling on disjointed PVC pipes downstream of MH 6.02.	2019	$52,000
CIP 3	Snob Hill LS Basin I/I and Pipe Improvements (Phase I)	Replace five sewer manholes that have infiltration possibilities due to gaps in the riser rings, holes within the manhole walls or failing grout.	2019	$134,000
CIP 4	Area Drain Disconnection	Disconnect area drain in school parking lot from the sanitary sewer and direct to a new infiltration trench west of the parking lot.	2019	$58,000
CIP 5	Middle Point LS Basin I/I and Pipe Improvements	Includes projects resulting from the CCTV inspection including: two side sewer replacements, two manhole replacements, and two new manholes associated with 120 LF of new pipe to replace bend between MH 13.05 and MH 13.06.	2019	$93,000
CIP 6	Sekiu LS Basin I/I Improvements	Includes projects resulting from the CCTV inspection including: three manhole replacements.	2019	$102,000
CIP 7	Clallam Bay I/I Improvements	Includes projects resulting from field inspections including: two manhole replacements.	2019	$84,000
CIP 8	Sekiu LS Basin Pipe Replacements	Includes replacing 3,340 LF of existing 8-inch concrete pipe with PVC pipe.	2019	$1,619,000
CIP 9	Sekiu Airport Road Basin Pipe Replacements	Includes replacing 1,340 LF of existing 8-inch concrete pipe with PVC pipe.	2019	$790,000
CIP 10	Snob Hill LS Basin I/I and Pipe Improvements (Phase II)	Includes replacing 4,745 LF 8-inch concrete pipe with 8-inch PVC pipe as well as 11 manholes.	2019	$2,441,000
CIP 11	West End LS Basin Pipe Replacements	Includes replacing 1,580 LF of existing 8-inch concrete pipe with PVC pipe.	2019	$719,000
CIP 12	Clallam Bay LS Basin Pipe Replacements	Includes replacing 13,665 LF of existing 8-inch concrete pipe with PVC pipe.	Beyond 2024	$6,072,000
CIP 13	Lighthouse LS Basin Pipe Replacements	Includes replacing 3,680 LF of existing 8-inch concrete pipe with PVC pipe.	Beyond 2024	$1,685,000
Total Gravity System Improvement Costs:				**$14,001,000**

(1) All costs are in 2018 dollars

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LIFT STATION CAPITAL IMPROVEMENTS

The following lift station projects are designed to improve operation and/or to replace aged portions of the existing lift stations.

CIP 14 – West End Lift Station

Lift station upgrades include new control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitation of the wet well.

Estimated Design Cost: $138,000
Estimated Construction Cost: $810,000
Estimated Total Project Cost: $947,000

CIP 15 – Middle Point Lift Station

Lift station upgrades include new control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitation of the wet well.

Estimated Design Cost: $132,000
Estimated Construction Cost: $772,000
Estimated Project Cost: $903,000

CIP 16 – Snob Hill Lift Station

Lift station upgrades include new control panels with telemetry, convert station to submersible type with new removable submersible pumps on rails, and a new valve vault with new piping and valves.

Estimated Design Cost: $147,000
Estimated Construction Cost: $863,000
Estimated Project Cost: $1,009,000

CIP 17 – Sekiu Lift Station

Lift station upgrades include new control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, as well as rehabilitation of the wet well.

Estimated Design Cost: $129,000
Estimated Construction Cost: $752,000
Estimated Project Cost: $880,000

CIP 18 –Olson Lift Station

Lift station upgrades include new control panels with telemetry, new removable submersible pumps on rails, new piping and valves in a new valve vault, and rehabilitation of the wet well.

Estimated Design Cost: $129,000
Estimated Construction Cost: $753,000
Estimated Project Cost: $881,000

CIP 19 – Lighthouse Lift Station

Lift station upgrades include new control panels with telemetry, new removable submersible pumps on rails, new piping and valves in a new valve vault, and rehabilitation of the wet well.

Estimated Design Cost: $140,000
Estimated Construction Cost: $821,000
Estimated Project Cost: $960,000

CIP 20 –Clallam Bay Lift Station

Lift station upgrades include new control panels with telemetry, converting the station to a submersible station with new removable submersible pumps on rails, and a new valve vault with new piping and valves.

Estimated Design Cost: $149,000
Estimated Construction Cost: $870,000
Estimated Project Cost: $1,018,000

Table 8-2 provides a summary of each lift station capital improvement project and the proposed schedule for implementation.

TABLE 8-2

Lift Station Capital Improvement Project Summary

Project No.	Project Name	Description	Projected Year	Total Estimated Cost[(1)]
CIP 14	West End LS Upgrades	Design	2019	$138,000
		Construction: New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well	2020-2021	$810,000
Total CIP 14 Cost:				**$947,000**
CIP 15	Middle Point LS Upgrades	Design	2019	$132,000
		Construction: New control panels with telemetry, new removable submersible pumps on rails, new piping & valves in new valve vault, and rehabilitate wet well.	2020-2021	$772,000
Total CIP 15 Cost:				**$903,000**
CIP 16	Snob Hill LS Upgrades	Design	2019	$147,000
		Construction: New control panels with telemetry, convert station to a submersible station with new removable submersible pumps on rails, new valve vault with new piping and valves.	2020-2021	$863,000
Total CIP 16 Cost:				**$1,009,000**
CIP 17	Sekiu LS Upgrades	Design	2019	$129,000
		Construction: New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well.	2020-2021	$752,000
Total CIP 17 Cost:				**$880,000**
CIP 18	Olson LS Upgrades	Design	2019	$129,000
		Construction: New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well.	2020-2021	$753,000
Total CIP 18 Cost:				**$881,000**

TABLE 8-2 – (continued)

Lift Station Capital Improvement Project Summary

Project No.	Project Name	Description	Projected Year	Total Estimated Cost[(1)]
CIP 19	Lighthouse LS Upgrades	Design	2019	$132,000
		Construction: New control panels with telemetry, convert station to submersible type with new removable submersible pumps on rails, new valve vault with new piping and valves.	2020-2021	$807,000
Total CIP 19 Cost:				**$939,000**
CIP 20	Clallam Bay LS Upgrades	Design	2019	$149,000
		Construction: New control panels with telemetry, new removable submersible pumps on rails, new piping and valves in new valve vault, and rehabilitate wet well.	2020-2021	$870,000
Total CIP 20 Cost:				**$1,018,000**
Total of All Lift Station Design Costs:				$964,000
Total of All Lift Station Construction Costs (w/out Design):				$5,641,000
Total of All Lift Station Project Costs:				**$6,598,000**

(1) Costs are in 2018 dollars.

WASTEWATER TREATMENT PLANT CAPITAL IMPROVEMENTS

The following wastewater treatment plant project is recommended to allow the County to provide wastewater treatment that meets regulatory requirements, ensures a safe working environment and is sustainable.

WWTP 1 and 2 – New Upland Oxidation Ditch WWTP (Design/Construction)

Design and construct a new upland WWTP to treat Clallam Bay and Sekiu flows with potential to increase facilities in the future to accommodate CBCC. Design costs include engineering services, legal, County administration, and permitting. Construction costs include construction administration.

Estimated Design Cost (WWTP 1): $4,824,000
Estimated Construction Cost (WWTP2): $22,510,000

TABLE 8-3

WWTP Capital Improvement Project Summary

Project No.	Description	Year to be Completed	Total Estimated Cost[(1)]
WWTP 1	New Upland Oxidation Ditch – Design	2019	$4,824,000
WWTP 2	New Upland Oxidation Ditch – Construction	2022	$22,510,000
Total WWTP Costs:			**$27,334,000**

(1) All project costs in 2018 dollars.

CAPITAL IMPROVEMENTS PLAN SCHEDULE

Table 8-4 provides a summary and schedule of each capital improvement project intended over the next 6 years whereas Table 8-5 lists the remaining projects scheduled within the next 20 years. The County can reschedule its capital improvement projects as needed to accommodate unanticipated projects or financial constraints in the future.

TABLE 8-4

6-Year Capital Improvement Project Summary

Project No.	Project Name	2019[(1)]	2020[(1)]	2021[(1)]	2022[(1)]	2023[(1)]	2024[(1)]
Gravity Mains							
CIP 1	I/I Repair Program	$52,000					
CIP 2	Funk & Ballard Pipe Repairs	$52,000					
CIP 3	Snob Hill LS Basin I/I and Pipe Improvements (Phase I)	$134,000					
CIP 4	Area Drain Disconnection	$58,000					
CIP 5	Middle Point LS Basin I/I and Pipe Improvements	$93,000					
CIP 6	Sekiu LS Basin I/I Improvements	$102,000					
CIP 7	Clallam Bay I/I Improvements	$84,000					
CIP 8	Sekiu LS Basin Pipe Replacements	$1,619,000					
CIP 9	Sekiu Airport Road Basin Pipe Replacements	$790,000					
CIP 10	Snob Hill LS Basin I/I and Pipe Improvements (Phase II)	$2,441,000					
CIP 11	West End LS Basin Pipe Replacements	$719,000					
Lift Stations							
CIP 14	West End LS Upgrades *(Design)*	$138,000		$810,000			
CIP 15	Middle Point LS Upgrades *(Design)*	$132,000		$772,000			
CIP 16	Snob Hill LS Upgrades *(Design)*	$147,000		$863,000			

TABLE 8-4 – (continued)

6-Year Capital Improvement Project Summary

Project No.	Project Name	2019[(1)]	2020[(1)]	2021[(1)]	2022[(1)]	2023[(1)]	2024[(1)]
Lift Stations – (continued)							
CIP 17	Sekiu LS Upgrades *(Design)*	$129,000		$752,000			
CIP 18	Olson LS Upgrades *(Design)*	$129,000		$753,000			
CIP 19	Lighthouse LS Upgrades *(Design)*	$132,000		$807,000			
CIP 20	Clallam LS Upgrades *(Design)*	$149,000		$870,000			
WWTP							
CIP 21	New Upland Oxidation Ditch WWTP Design & Permitting	$4,824,000					
CIP 22	New Upland Oxidation Ditch WWTP Construction				$22,510,000		
Total Costs:		**$11,924,000**		**$ 5,627,000**	**$22,510,000**		

(1) Costs are in 2018 dollars.

TABLE 8-5

20-Year Capital Improvement Project Summary

Project No.	Project Name	Total Estimated Cost[(1)]
Gravity Mains		
CIP 12	Clallam Bay LS Basin Pipe Replacements	$6,072,000
CIP 13	Lighthouse LS Basin Pipe Replacements	$1,685,000
Total Costs:		**$7,757,000**

(1) All project costs in 2018 dollars.

CHAPTER 9

FINANCIAL ANALYSIS

INTRODUCTION

This chapter contains an analysis that describes how Clallam County can support future operating expenses and finance the wastewater improvement outlined in the previous chapters. The potential funding sources, the financial status of the sewer utility, the funding required to pay for the scheduled improvements, and the impact of wastewater improvements on sewer rates are presented.

FINANCIAL STATUS OF EXISTING CLALLAM BAY – SEKIU SEWER DISTRICT

CURRENT SEWER RATES

The sewer rates for the Clallam Bay – Sekiu Sewer District are defined in the Clallam County Code Chapter 13.04.030. The current rates and the rates for 2019 are shown in Table 9-1.

TABLE 9-1

Clallam Bay – Sekiu Sewer District Rates

Account	2018		2019	
	Basic	Volume Charge(1)	Basic	Volume Charge(1)
Commercial and Government	$55/month	$0.07/cf	$56.50	$0.07
Dwelling Units	$49	$0.07	$51	$0.07

(1) Volume charge: Additional fee per cubic foot of metered water use over 700 cubic feet per month.

CURRENT SEWER CONNECTION CHARGES

Connection charges are defined in the Clallam County Code Chapter 13.04.040. The connection charge for a new connection, residential or commercial/governmental, is $1,500 per connection and $75 fee for inspection. In addition, connection for properties located outside of the Clallam Bay/Sekiu sewage district boundaries will be assessed a $3,000 fee.

HISTORICAL FINANCIAL OPERATIONS

Sewer utility operating revenue and expenses for the years 2015 through 2017 are summarized in Table 9-2.

TABLE 9-2

Historical Operating Revenues and Expenses

Operating Revenue	**2015**	**2016**	**2017**
Inspection Fee	$0.00	$50.00	$0.00
Residential Fees	$140,919.25	$159,324.36	$151,154.42
Commercial Fees	$81,953.28	$73,355.97	$87,452.38
Penalties and Interest	$88,43.22	$2,044.85	$5,550.06
Other Public Authorities	$11,666.28	$11,994.24	$18,201.00
Other Public Authorities -Prison	$24,659.31	$30,595.44	$32,244.80
Investment Interest	$90.71	$276.28	$1,587.83
Interfund Rents	$1,800.00	$1,800.00	$1,800.00
Judgements and Settlements	$0.00	$0.00	$8,310.69
Other Miscellaneous Revenue	$0.00	$0.00	0
Transfer from Real Estate Excise	$50,000.00	$150,000.00	$150,000.00
Transfer from General Fund Reserve	40.00	$0.00	$60,000
Total Operating Revenue	$319,932.05	$429,441.14	$516,301.18
Expenditures	**2015**	**2016**	**2017**
Regular Time	$133,079.90	$141,237.39	$150,606.38
Overtime	$12,190.15	$10,891.63	$11,107.76
Premiums	$240.00	$240.00	$240.00
Benefits	$52,008.76	$57,154.15	$63,869.01
Public Works Supplies	$37,154.63	$33,222.89	$31,894.37
Public Works Intergovernmental Services	$1,453.20	$1,466.16	$1,483.44
Indirect Cost Charges	$36,378.28	$38,464.53	$40,489.28
PW Other Services and Charges	$71,817.56	$88,469.58	$102,292.77
PW Capital Machinery and Equipment	$0.00	$9,474.34	$0.00
Transfer to Employee Health Care	$0.00	$0.00	$0.00
Total Operating Expenses	$344,322.48	$380,616.67	$401,983.01

Table 9-3 summarizes the net operating revenue (operating revenue minus operating expenses) from 2015 to 2017. The net operating revenue is typically positive; however without the annual transfer from the Real Estate Excise Tax and the General Fund the net operating revenue would be negative.

TABLE 9-3

Historical Net Operating Revenue

Net Operating Revenue	2015	2016	2017
Operating Revenue	$319,932.05	$429,441.14	$516,301.18
Operating Expenses	$344,322.48	$380,616.67	$401,983.01
Net Operating Revenue	($24,390.43)	$48,824.47	$114,318.17

PROJECT GROWTH

In order to project future revenues, the growth in the number of customers must be estimated. Chapter 2 included a discussion of the projected population for the Clallam Bay-Sekiu UGO. Current population in the UGO is estimated to be 562. The project population growth is 1.0 percent per year which results in a 2038 population of 693. The projected increase in sewer connections in the sewer systems was also discussed in Chapter 2. The number of sewer connections in 2017 is 327 (259 residential, 52 commercial and 16 public authorities). In addition, it is estimated that there are potentially 245 connections within the sewer service area that are currently unbilled. This number includes 46 permanent residences and 199 transient (i.e., RV parks, motels). Assuming the number of connections increases at the same rate as population per year the number of potential sewer connections in 2038 is 393 residential (including currently un-billed residential connections) and 82 commercial/public authority accounts. If increased at the same growth rate of 1.0 percent per year, the transient connections would escalate to 242 connections. As commercial and transient ERUs may be equivalent to less than or more than one standard single family residence ERU, the County is currently reviewing its policies on how commercial and transient ERUs will be calculated and therefore, how these facilities will be billed.

PROJECTED EXPENSES, REVENUES, AND CAPITAL RESERVES

FUTURE OPERATING REVENUES AND EXPENSES

Tables 9-2 and 9-3 show the background data upon which the operating revenue and expenses projections developed below are based. Forecast factors used in determining the projects are shown in Table 9-4. The sewer rates have increased by approximately 3 percent per year 2017-2019. This rate of increase is assumed to continue. The increase in COLA is assumed to be 3 percent and the inflation increase for goods and services is assumed to be 4 percent. The transfer from the real estate excise tax and general fund are not assumed to increase. The salaries and benefits are assumed to increase 33 percent in 2019 to fund an additional FTE.

Connection charges are based on the total number of connection in the systems projected to increase by 1 percent per year. The growth in connections from 2018-2024 is

projected to be 3 connections/year. An annual connection charge revenue of $4,500/year is anticipated.

Table 9-4 presents the projected operating revenues for the sewer utility. Revenues and expenses for 2018 – 2024 are projected based on the 2017 actual revenue and expenses and the COLA and inflation rates discussed above. It should be noted that the anlaysis presented herein, does not include the currently unbilled transient connections. The County intends to get an accurate count of these connections and will revise its policies as appropriate to charge these connections (i.e., for instance, RV parks could be charged at 60 percent the rate of a single-family residence). Once these currently unbilled connections generate revenue, the County shall reassess the financial forecast.

TABLE 9-4

Projected Operating Revenues

Revenues	2017	2018	2019	2020	2021	2022	2023	2024
Residential Fees(1)	$151,154	$157,246	$161,142	$167,636	$174,392	$181,420	$188,731	$196,337
Commercial Fees	$87,452	$90,977	$94,643	$98,457	$102,425	$106,553	$110,847	$115,314
Penalties and Interest	$5,550	$5,717	$5,888	$6,065	$6,247	$6,434	$6,627	$6,826
Other Public Authorities	$18,201	$18,747	$19,309	$19,889	$20,485	$21,100	$21,733	$22,385
Other Public Authorities - Prison	$32,245	$33,212	$34,209	$35,235	$36,292	$37,381	$38,502	$39,657
Investment Interest	$1,588	$1,651	$1,701	$1,752	$1,804	$1,859	$1,914	$1,972
Interfund Rents	$1,800	$1,854	$1,910	$1,967	$2,026	$2,087	$2,149	$2,214
Judgements and Settlements	$8,311	$8,560	$8,817	$9,081	$9,354	$9,634	$9,923	$10,221
Transfer from Real Estate Excise	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Transfer from General Fund	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000
Total Operating Revenue	$516,301	$527,964	$537,619	$550,082	$563,025	$576,467	$590,427	$604,925

(1) Assumes 1 percent growth per year and 3 percent rate increase. Year 2019 assumes the currently unbilled residential accounts are billed.

Table 9-5 presents the projected operating expenditures for the sewer utility.

TABLE 9-5

Projected Operating Expenditures

Expenses	2017	2018	2019	2020	2021	2022	2023	2024
Salaries and Benefits(1)	$225,823	$232,598	$318,636	$328,195	$338,041	$348,182	$358,627	$369,386
Supplies	$31,894	$33,170	$34,497	$35,877	$37,312	$38,804	$40,357	$41,971
Intergovernmental Services	$1,483	$1,543	$1,604	$1,669	$1,735	$1,805	$1,877	$1,952
Indirect Cost Charges	$40,489	$42,109	$43,793	$45,545	$47,367	$49,261	$51,232	$53,281
Other Services and Charges	$102,293	$106,384	$110,640	$115,065	$119,668	$124,455	$129,433	$134,610
Total Operating Expenses	$401,983	$414,043	$426,464	$439,258	$452,435	$466,008	$479,989	$494,388

(1) Increase in salaries and benefits of 33 percent for 1 additional FTE.

Maintaining reserves at an appropriate level to provide for operations, revenue stabilization, emergency repair or replacement of essential equipment and for capital maintenance is an element of sound utility management. The projected net operating revenue remains positive through the transfers from the real estate excise tax and general fund. The utility is able to support basic operation but because of the limited rate base is not able to support capital improvement expenditures.

CAPITAL EXPENDITURES AND RESERVES

Capital improvement projects to be funded over the period 2019 – 2024 are summarized in Table 9-6. Collection system and WWTP improvements are described in Chapter 6 and 7, respectively, and are summarized below. These projects will be debt financed.

TABLE 9-6

Projected Capital Expenditures

Project No.	Project Name	2019[(1)]	2020[(1)]	2021[(1)]	2022[(1)]	2023[(1)]	2024[(1)]
Gravity Mains							
CIP 1	I/I Repair Program	$52,000					
CIP 2	Funk & Ballard Pipe Repairs	$52,000					
CIP 3	Snob Hill LS Basin I/I and Pipe Improvements (Phase I)	$134,000					
CIP 4	Area Drain Disconnection	$58,000					
CIP 5	Middle Point LS Basin I/I and Pipe Improvements	$93,000					
CIP 6	Sekiu LS Basin I/I Improvements	$102,000					
CIP 7	Clallam Bay I/I Improvements	$84,000					
CIP 8	Sekiu LS Basin Pipe Replacements	$1,619,000					
CIP 9	Sekiu Airport Road Basin Pipe Replacements	$790,000					
CIP 10	Snob Hill LS Basin I/I and Pipe Improvements (Phase II)	$2,441,000					
CIP 11	West End LS Basin Pipe Replacements	$719,000					
Lift Stations							
CIP 14	West End LS Upgrades *(Design)*	$138,000		$810,000			
CIP 15	Middle Point LS Upgrades *(Design)*	$132,000		$772,000			
CIP 16	Snob Hill LS Upgrades *(Design)*	$147,000		$863,000			

TABLE 9-6 – (continued)

Projected Capital Expenditures

Project No.	Project Name	2019[(1)]	2020[(1)]	2021[(1)]	2022[(1)]	2023[(1)]	2024[(1)]
Lift Stations – (continued)							
CIP 17	Sekiu LS Upgrades *(Design)*	$129,000		$752,000			
CIP 18	Olson LS Upgrades *(Design)*	$129,000		$753,000			
CIP 19	Lighthouse LS Upgrades *(Design)*	$132,000		$807,000			
CIP 20	Clallam LS Upgrades *(Design)*	$149,000		$870,000			
WWTP							
CIP 21	New Upland Oxidation Ditch WWTP Design & Permitting	$4,824,000					
CIP 22	New Upland Oxidation Ditch WWTP Construction				$22,510,000		
Total Costs:		**$11,924,000**		**$ 5,627,000**	**$22,510,000**		

(1) Costs are in 2018 dollars.

CAPITAL IMPROVEMENTS FINANCING

The sewer utility is not adequate to self-finance the schedule of project shown in Table 9-6. The County needs to consider a combination of grants, debt financing along with monthly service rate adjustments.

PUBLIC FINANCING SOURCES

The following section describes several financing sources available to the County. Each funding source has different eligibility dependent upon the programs goals and mission. In addition each funding source has different requirements for how they may calculate the County's grant and loan eligibility. Some programs rely on median household income statistics while other programs look at the low-to-moderate income status for the region. Following is a description of each program.

DEPARTMENT OF COMMERCE CDBG GENERAL PURPOSE GRANT

The Department of Commerce administers the Community Development Block Grant (CDBG) General Purpose Grant Program. This program makes funds available annually through a competitive application process to assist Washington cities, towns, and communities. Eligible activities include "public facilities such as water, wastewater, and streets." A main emphasis of this program is to provide services to low- and moderate-income (LMI) persons. To be eligible for the program a community must be over 51 percent LMI. The maximum grant available is $750,000, the applications are typically due in June of each year.

DEPARTMENT OF ECOLOGY STATE REVOLVING FUND

Ecology administers the State Revolving Fund (SRF) program, which makes no- and low-interest loans available to communities with qualifying projects. Application for these funds is through Ecology's annual funding cycle in the fall. SRF loans are available for planning, design, and construction projects. Loans are available for terms up to 30 years at interest rates that are calculated at 60 percent of the average municipal bond interest rate. For qualifying low-income communities, zero percent loans can be made available.

Grant and loan eligibility is based on what Ecology terms as hardship. Hardship is when a community's monthly rate exceeds 2 percent of the median household income (MHI). Ecology has four levels of hardship as shown in Table 9-7.

TABLE 9-7

Ecology Hardship Funding

Sewer Fee/MHI	<2%	>/=2%but<3%	>/=3% but <5%	>/=5%
Hardship Designation	Non-hardship	Moderate hardship	Elevated hardship	Severe hardship
20-Year Loan Rates	1.5%	1.0%	0.5%	0.0%
Grant Eligibility	Not Eligible	50% up to $5M	75% up to $5M	100% up to $5M

USDA-RURAL DEVELOPMENT

The USDA Rural Development agency (RD) has a loan program which, under certain conditions, includes a limited grant program. Grants may be awarded when the average user rate exceeds 1.5 percent of the median household income. Loans are offered at interest rates of around 2.0 to 3.0 percent at terms up to 40 years. Because RD is a federal funding program, an environmental report meeting the requirements of NEPA is required.

REVENUE BONDS

Another source of funds for construction of major utility improvements is the sale of revenue bonds. The County would issue the tax-free bonds. The major source of funds for debt service on these revenue bonds is from sewer service rates. In order to qualify to sell revenue bonds, the County must show that its net operating income (gross income less expenses) is equal to or greater than a debt coverage factor times the annual principal and interest payments due for all outstanding bonded indebtedness. The debt coverage factor is applicable to revenue bonds sold on the commercial market. The County's bond writer will set the debt coverage factor and it may vary from 1.2 to 1.4.

GENERAL OBLIGATION BONDS

The County, by special election, may issue general obligation bonds to finance almost any project of general benefit to the community. Assessments levied against all privately owned properties within the community will pay for the bonds. This includes vacant property that otherwise would not contribute to the cost of such general improvements. This type of bond issue is usually reserved for municipal improvements that are of general benefit to the public, such as arterial streets, bridges, lighting, municipal buildings, firefighting equipment, parks, and water and wastewater facilities. Because the money is raised by assessment levied on property values, the business community also provides a fair share of funds to pay off such bonds.

General obligation bonds have the best market value and carry the lowest interest rate of all types of bonds available to the County.

Disadvantages of general obligation bonds include the following:

- Voter approval is required which may be time-consuming, with no guarantee of successful approval of the bond.

- The County would have a practical or legal limit for the total amount of general obligation debt. Financing large capital improvements through general obligation debt reduces the ability of the utility to issue future debt for projects such as parks and community facilities that cannot be directly funded through enterprise funds.

UTILITY LOCAL IMPROVEMENT DISTRICTS

Another potential source of funds for improvements comes through the formation of Utility Local Improvement Districts (ULIDs) involving an assessment made against properties benefited by the improvements. ULID bonds are further guaranteed by revenues and are financed by issuance of revenue bonds. ULID financing is frequently applied to sewer system extensions into previously unserved areas. Typically, ULIDs are formed by the municipality at the written request (by petition) of the property owners within a specific area of the municipality. Upon receipt of a sufficient number of signatures on petitions, the local improvement area is defined, and a sewer system is designed for that particular area in accordance with the municipality's general comprehensive plan. Each separate property in the ULID is assessed in accordance with the special benefits the property receives from the sewer system improvements.

DEVELOPER FINANCING

Developers may fund the construction of extensions to the sewer system to property within new plats. The developer extensions are turned over to the County for operation and maintenance when completed.

It may be necessary, in some cases, to require the developer to construct more facilities than those required by the development in order to provide either extensions beyond the plat and/or larger pipelines for the ultimate development of the sewer system. The County may, by policy, reimburse the developer through direct outlay, latecomer charges, or reimbursement agreements for the additional cost of facilities, including increased size of pipelines over those required to serve the property under development. Construction of any pipe in commercial or industrial areas that is larger than the size required to serve the development should also be considered as an oversized line possibly eligible for compensation.

COMMUNITY ECONOMIC REVITALIZATION BOARD (CERB)

CERB is administered through the Department of Commerce and provides funding to local governments for public infrastructure which supports private business growth and expansion. Eligible projects for CERB funding include domestic and industrial water, storm water, wastewater, public buildings, telecommunications and port facilities, among others. CERB can provide funding for the following opportunities:

- Committed Private Partner Program: A private business or development is ready to occur and is contingent on approval of CERB funds. The project will create a significant number of permanent jobs or generate significant private capital investment. The median hourly wage of private sector jobs created after the project is completed must exceed the countywide median wage. Up to $300,000, or 50 percent of the total award, whichever is less, may be awarded as grant, with a 20 percent cash match required.

- Planning Projects: Limited funds are available to fund studies which evaluate high priority economic development projects. Priority is given to applications which could ultimately result in a type of project eligible for CERB construction funds. Up to $50,000 may be awarded as grant and a 25 percent cash match is required.

- Prospective Development Construction Program: Rural communities may receive loans and grants for public infrastructure to enable future business development. The Sekiu and Clallam Bay communities would be eligible for this program if an economic feasibility study demonstrated that private business development is likely to occur as a result of the public improvements. As with the Committed Private Partner Program, the development would need to lead to significant job creation, and it must be demonstrated that the applicant has no other feasible funding alternative. Up to $300,000, or 50 percent of the total award may be awarded as grant, with a 50 percent cash match required.

GENERAL FACILITY CHARGE

A General Facility Charge (GFC) is a charge to connect to and purchase capacity in the sanitary sewer system and to address the added demand placed upon the system. A GFC is intended to cover the cost of developing the necessary capital facilities to support the expanded capacity. A GFC is typically charged when a new development connects to a City's system or expansions of a development necessitates additional capacity. A GFC study can be performed to evaluate recommended GFC charges for expansions to the system.

FUNDING SUMMARY

Many of the funding programs described above, such as the CERB program, are specific to a community's particular needs. The most likely funding programs for the capital improvements necessary in Sekiu and Clallam Bay are Ecology Centennial/SRF Program, Rural Development and CDBG.

APPENDIX A

SEPA CHECKLIST

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable: Clallam Bay/Sekiu General Sewer/Wastewater Facilities Plan

2. Name of applicant: Clallam County Department of Public Works

3. Address and phone number of applicant and contact person:
Ross Tyler, P.E.
County Engineer
223 East 4th Street, Suite #6
Port Angeles, WA 98362
360-417-2448

4. Date checklist prepared: October 5, 2018,

5. Agency requesting checklist: Department of Ecology

6. Proposed timing or schedule (including phasing, if applicable): Complete General Sewer/Wastewater Facilities Plan – December 2018

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. Yes

The General Sewer/Wastewater Facilities Plan identifies collection system and wastewater treatment facility improvements that are necessary to maintain the integrity of the system and provide adequate treatment capacity. The County will pursue funding for the design and construction of the improvements. The SEPA process will be followed for all non-exempt construction projects.

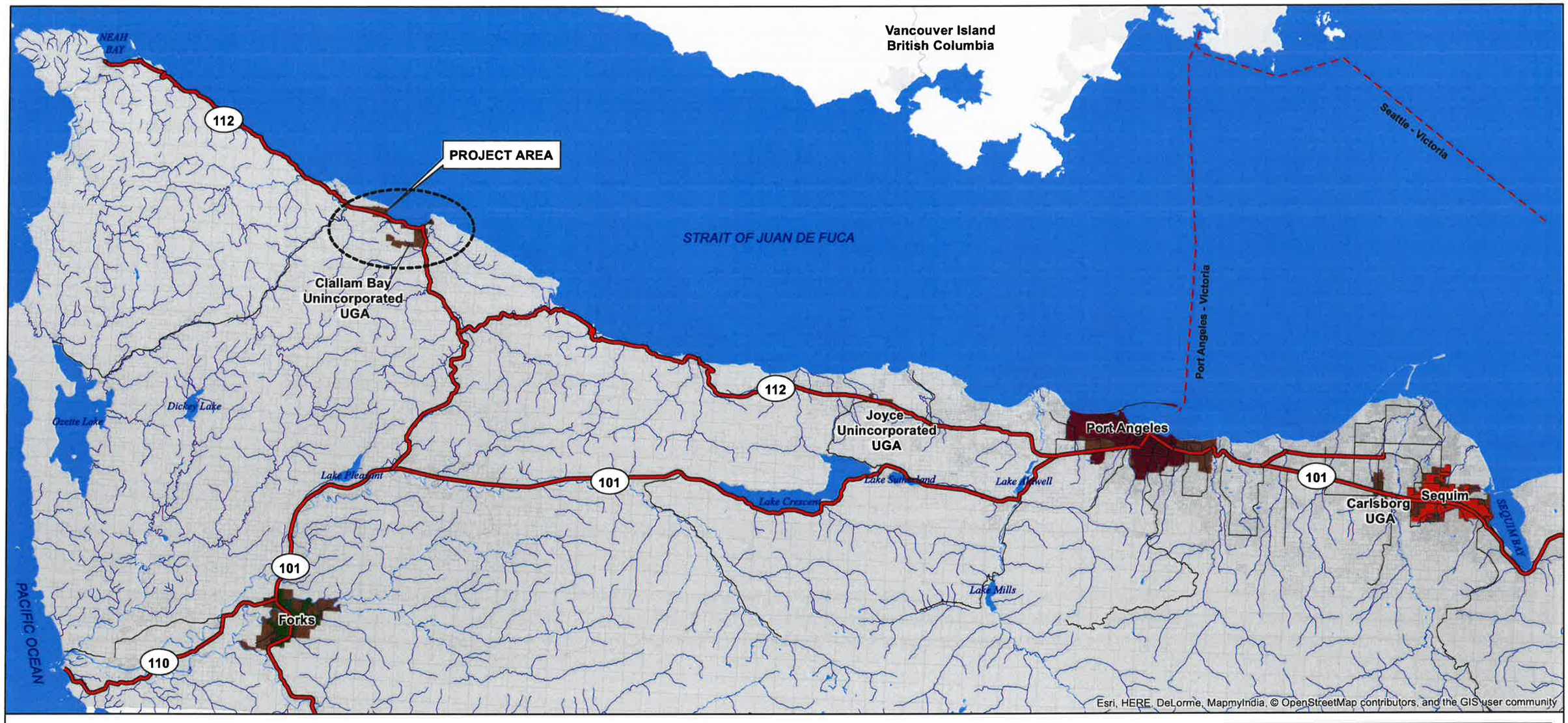
8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- Clallam County Shorelines Master Program, Clallam County, 1976
- Sekiu – Clallam Bay Sewerage General Plan, Kennedy Engineers, August 1972
- Clallam Bay and Sekiu Wastewater Treatment Plants Expansion and Upgrading, Ten Percent Design Report, Culp, Wesner, Culp Consulting Engineers, May 1985
- Infiltration/Inflow Analysis for Clallam Bay and Sekiu Utility Improvement District, HER Engineering, Inc., March 1990
- Geotechnical Report, Front Street Retaining Wall, Sekiu Clallam County, Washington, Shannon and Wilson Geotechnical and Environmental Consultants, June 1993
- Geotechnical Evaluation of Washington Street Slide, Sekiu, Washington, Shannon and Wilson Geotechnical and Environmental Consultants, July 1999
- Clallam County Water System Plan Update, April 2017

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None Known.

10. List any government approvals or permits that will be needed for your proposal, if known.



N

0 2.5 5 10 Miles

LEGEND

- REGIONAL HIGHWAY
- MAJOR ROAD
- RIVER
- WATERBODY
- PARCEL
- FORKS
- PORT ANGELES
- SEQUIM
- UNINCORPORATED URBAN GROWTH AREA

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 1-1
VICINITY MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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WESTEND LIFT STATION

SNOB-HILL LIFT STATION

OUTFALL

OLSON LIFT STATION

SEKIU LIFT STATION

WASTEWATER TREATMENT PLANT

MIDDLE POINT LIFT STATION

CLALLAM BAY

FALLS CREEK

LITTLE HOKO RIVER

112

Hwy 112

Park Loop Dr

Funk & Ballards Aly

Sekiu Heights Rd

Simmons St

Washington St

Commercial St

Rice St

Front St

Konopaski Heights Rd

N

0 625 1,250 2,500 Feet

LEGEND

- SEWER MANHOLE
- GRAVITY SEWER PIPE
- FORCE MAIN
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- CURRENT SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-1
SEWER SERVICE AREA (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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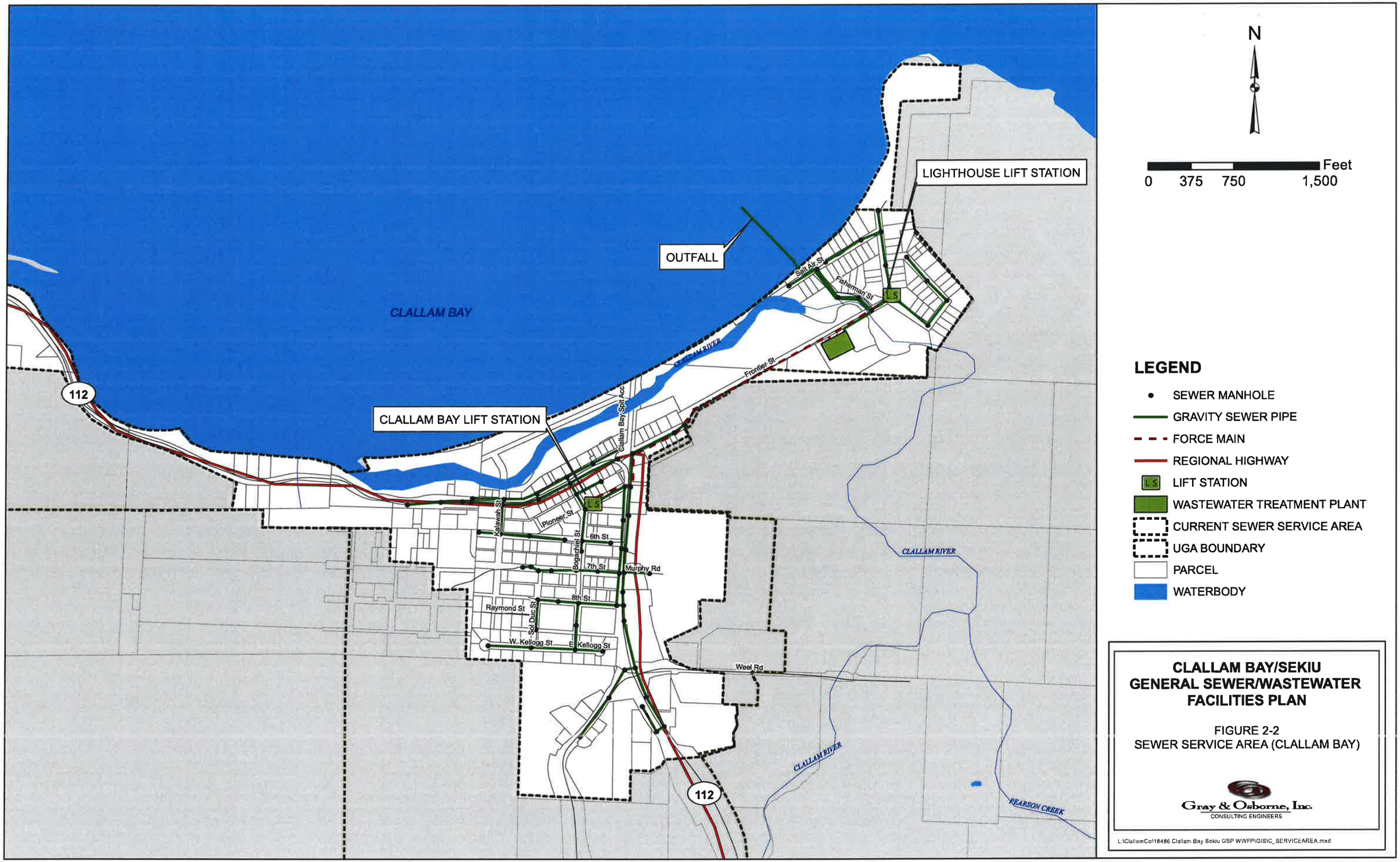

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

FIGURE 2-2
SEWER SERVICE AREA (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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- Department of Ecology Approval for General Sewer Plan/Wastewater Facilities Plan
- SEPA Determination
- Department of Ecology SERP Approval

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

This planning document provides a list of sanitary sewer pipe repair and replacement projects that the County will implement. The replacement of the sewer pipe (less than 12-inch diameter) is exempt from SEPA per WAC 197-11-800(23)(b) – Categorical exemptions.

This planning document also provides proposed conceptual designs, cost estimates, schedule and financing plan for recommended lift station and wastewater treatment facility improvements. The project described in the Plan are consistent with Washington State regulations relating to the prevention and control of discharge of pollutants into waters of the state, anti-degradation of existing and future beneficial uses of groundwater, and anti-degradation of surface water. SEPA checklists for projects other than exempt activities will be prepared.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The sewer collection and treatment systems that are the subject of this planning document are located in the Clallam Bay and Sekiu communities which are located along Highway 112 in northwest Clallam County. Figure 1-1 identifies the location of the study area. Figures 2-1 and 2-2 identify the sewer service areas for Sekiu and Clallam Bay.

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site:

(circle one): Flat, rolling, **hilly**, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)? The steepest slope in the sewer service areas is approximately 20% in Sekiu.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

- Sekiu: Loam and silt loam
- Clallam Bay: Silt loam and very gravelly loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

The east facing hill above the Sekiu waterfront has experienced slope movement. Two geotechnical evaluations have investigated the apparent slope movement.

- A geotechnical evaluation in 1993 was performed to support the installation of a retaining wall along Front Street (Geotechnical Report – Front Street Retaining Wall, Sekiu, Clallam County, Washington, June 1993, Shannon & Wilson, Inc.). Front Street extends northwards from State Route 112 and approximately parallels the Sekiu waterfront. The southern portion of Front Street is located above a steep slope that extends to the east to the beach and near the bottom of a steep slope to the west. The geotechnical evaluation noted that the slope to the east showed signs of creep, the downward movement of loose/soft soils on slopes under the action of gravity. The creeping soils are underlain by more competent weathered sandstone which, in the opinion of the geotechnical engineer, are not likely to experience deep-seated slope stability failure.
- A geotechnical evaluation in 1999 addressed the apparent downward movement of Washington Street, an asphalt-paved roadway that traverses across and down the east-facing hillside (Geotechnical Evaluation of Washington Street Slide, Sekiu, Washington, July 1999, Shannon and Wilson, Inc.). The geotechnical evaluation opined that the observed slope movements are indicative of a relatively large, deep-seated slide and that the cause of the slope movement may be associated with the relatively low shear strength of the silty soils (soft siltstone) and is influenced by moisture content or the degree of saturation of the soil.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The General Sewer/Wastewater Facilities Plan recommends lift station replacement and construction of an upland wastewater treatment plant. Lift station improvements will require excavation for new wet wells or valve vaults. Construction of an upland wastewater treatment plant will require excavation for the treatment tankage and building foundations. The General Sewer/Wastewater Facilities Plan is not a design document and the actual quantity of excavation, fill and grading is not know at this time. SEPA checklists will be prepared for specific construction projects.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of the potential for erosion during construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of the percent of impervious coverage of a specific site.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of erosion control that will be implemented during construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of potential air emission sources during and after construction and approximately quantities of air emissions.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of proposed measures to reduce or control air emission during and after construction.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Clallam Bay and the Strait of Juan de Fuca are located immediately adjacent to the communities of Clallam Bay and Sekiu. The Clallam River is located to the north and northeast of the Clallam Bay Wastewater Treatment Plant.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of proposed work over, in or adjacent to the described waters.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of the proposed amount of fill and dredge material that would be placed in or removed from surface water or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that future construction projects will require withdrawals or diversions of surface water.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of the location of the proposed in relation to the 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects including a discussion of the location of discharge of treated effluent from the wastewater treatment facility.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that future construction projects will require withdrawals of groundwater.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that future construction projects will result in the discharge of waste material into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. Stormwater will be generated from impervious surfaces. Future design will include stormwater collection and treatment.

2) Could waste materials enter ground or surface waters? If so, generally describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that future construction projects will result in the discharge of waste material into the ground or surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss the impacts to drainage patterns in the vicinity of the proposed construction project.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that

discuss proposed measures to control surface, ground and runoff water and drainage impacts during and after construction.

4. Plants [help]

a. Check the types of vegetation found on the site: **Plants found in the study area.**

_X___deciduous tree: alder, maple, aspen, other
_X___evergreen tree: fir, cedar, pine, other
_X___shrubs
_X___grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
__X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss the kind and amount of vegetation that will be removed or altered.

c. List threatened and endangered species known to be on or near the site.

The following threatened and endangered species are known to be in or near the study area.

None known

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss proposed landscaping for replaced and upgraded facilities.

e. List all noxious weeds and invasive species known to be on or near the site.

Bohemian knotweed *Polygonum bohemicum*
Giant knotweed *Polygonum sachalinense*
Giant hogweed *Heracleum mantegazzianum*
Butterfly bush *Buddlega davidii*
Reed canarygrass *Phalaris arundinacea*
Herb Robert, *Geranium robertianum*
Canada thistle *Cirsium arvense*

Poison Hemlock *Conium maculatum*
Yellow archangel *Lamium galeobdolon*

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site.

Birds
Marbled Murrelet *Brachyramphus marmoratus* (Threatened)
Short-tailed Albatross *Phoebastria albatrus* (Endangered)
Streaked Horned Lark *Eremophila alpestris strigata* (Threatened)
Yellow-billed Cuckoo *Coccyzus americanus* (Threatened)

Fishes
Bull Trout *Salvelinum confluentus* (Threatened)
Dolly Varden *Salvelinus malma* (Threatened)

c. Is the site part of a migration route? If so, explain.

The study area is located in the Pacific flyway migratory bird flyway.

d. Proposed measures to preserve or enhance wildlife, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss proposed measures to preserve or enhance wildlife.

e. List any invasive animal species known to be on or near the site.

None known.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss energy resources required for the proposed project. It is anticipated lift station and wastewater treatment facilities will rely primarily on electrical energy.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discusses the potential to affect the use of solar energy on adjacent properties. It is not anticipated that the lift station and wastewater treatment facilities will affect the use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discusses the energy conservation features of the lift stations and wastewater treatment facilities. It is anticipated that the energy efficient pumps, motors, mechanical equipment and operating schemes will be incorporated in the lift station and wastewater treatment plant designs.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discusses the potential environmental health hazards associated with the construction and operation of lift stations and wastewater treatment plants and how these hazards will be eliminated or minimized.

1) Describe any known or possible contamination at the site from present or past uses.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discusses the known or possible contamination of the specific sites covered by the SEPA checklist.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss the existing hazardous chemicals/conditions that might affect the project.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss any toxic or hazardous chemicals that might be stored, used or produced by the project.

4) Describe special emergency services that might be required.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss special emergency services that might be required by the project. It is not anticipated that special emergency services will be required for the lift stations and wastewater treatment facility.

5) Proposed measures to reduce or control environmental health hazards, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss measures to reduce or control environmental health hazards that may be associated with the particular project.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. Existing noise does not affect the planning process. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that existing noise in the area will affect the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. This project will not create noise. SEPA checklists will be prepared for specific non-exempt construction projects that discuss the noise levels, duration and occurrence associated with the construction and operation of the lift stations and wastewater treatment facility.

3) Proposed measures to reduce or control noise impacts, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss measure to reduce or control noise generated during construction and operation of the lift stations and wastewater treatment facility.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. The study area includes properties used for residential, commercial and industrial uses. SEPA checklists will be prepared for specific non-exempt construction projects that discuss the land use in the vicinity of the proposed project.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. The study area includes properties that were historically used as working forest land. SEPA checklists will be prepared for specific non-exempt construction projects that discuss the historic land use in the vicinity of the proposed project.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that discuss the effect of the proposal on surrounding farm or forest land.

c. Describe any structures on the site.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the existing structures on the project site.

d. Will any structures be demolished? If so, what?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document and does not identify demolition of any structures. SEPA checklists will be prepared for specific non-exempt construction projects that describe demolition of existing structures on the site.

e. What is the current zoning classification of the site?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the current zoning classification of the site.

f. What is the current comprehensive plan designation of the site?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the current comprehensive plan classification of the site.

g. If applicable, what is the current shoreline master program designation of the site?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the current shoreline master program designation of the site if applicable.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the whether the project site is located in a critical area.

i. Approximately how many people would reside or work in the completed project?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the number of people who will work in the completed project. No people will reside in the recommended project.

j. Approximately how many people would the completed project displace?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the number of people who may be displaced by the project. It is not anticipated people will be displaced by the recommended projects.

k. Proposed measures to avoid or reduce displacement impacts, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the measures taken to avoid displacing people as a result of the project.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the measures taken to ensure the proposal is compatible with existing and projected land use plans.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe the measures taken to ensure the proposal minimizes impact to agricultural and forest-lands of long-term commercial significance.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe that no housing unit will be provided by the project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe that no housing unit will be eliminated by the project.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe that the height of lift station or wastewater treatment facility structures.

b. What views in the immediate vicinity would be altered or obstructed?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe if any views in the immediate vicinity would be altered or obstructed.

b. Proposed measures to reduce or control aesthetic impacts, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe measures to reduce or control aesthetic impacts.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that describe what type of light or glare would be produced.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that light or glare would be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

No off-site sources will affect the planning document discussed in this checklist.

d. Proposed measures to reduce or control light and glare impacts, if any:

None required.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

Fishing, hunting, hiking, and camping.

b. Would the proposed project displace any existing recreational uses? If so, describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that the future projects would displace any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that the future projects would displace any existing recreational uses.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that will identify any buildings, structures or sites that are located on or near the proposed project site.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that will identify any landmarks, features, or other evidence of native American or historic use or occupation that are located on or near the proposed project site.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. The Makah, Lower Elwha Klallam, Jamestown S'Klallam, Quileute and Hoh Tribes, and Department of Archeological and Historic Preservation will be notified of the proposed project.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. If it is determined historic sites are located on or in close proximity to the project are identified a cultural resources survey will be conducted. The construction specifications will include an Inadvertent Discovery Plan that will be implemented in the event cultural resources are uncovered.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The Clallam Bay and Sekiu communities are served by Hwy 112.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

Clallam Transit System services Clallam Bay/Sekiu. There are 4 runs between Forks and Neah Bay with a stop in Clallam Bay four times a day and two times a day on Saturday.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that will describe the parking spaces provided for the proposed project.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that will describe the improvements to existing streets or transportation routes will be required for the proposed project.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that the projects will utilize water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects will describe the number of vehicle trips generated by the proposed project.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that the projects will interfere with the movement of agricultural and forest products.

h. Proposed measures to reduce or control transportation impacts, if any:

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects that will discuss proposed measures to reduce or control transportation impacts.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that the project will result in an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects. It is not anticipated that the project will result in an increased need for public services.

16. Utilities [help]

a. Circle utilities currently available at the site: AVAILABLE IN STUDY AREA
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects which will discuss the utilities available at the proposed sites.

c. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

This SEPA checklist discusses the General Sewer/Wastewater Facility Plan, a planning document. SEPA checklists will be prepared for specific non-exempt construction projects which will discuss the utilities that will be required for the proposed sites.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Nancy Lockett

Name of signee Nancy B. Lockett

Position and Agency/Organization Engineer / Gray + Osborne, Inc.

Date Submitted: 10/9/18

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities will address the needs identified in the plan will be addressed in SEPA checklists prior to construction. The future projects will provide wastewater conveyance and treatment capacity to meet the demands of the community. The discharge of treated wastewater via a marine outfall will increase as the population of the community increases. It is not anticipated there will be releases of toxic or hazardous substances.

Proposed measures to avoid or reduce such increases are:

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities will address the needs identified in the plan will be addressed in SEPA checklists prior to construction. The checklists will address measures that will be included in the project to avoid or reduce emissions to air and use/production/release/storage of toxic or hazardous substances.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities will address the needs identified in the plan are not likely to affect plants, animals, fish or marine life. The proposed projects will comply with environmental regulations regarding water quality, erosion/sediment control, and stormwater control.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities will address the needs identified in the plan are not likely to affect plants, animals, fish or marine life. SEPA checklists will be prepared for future non-exempt projects. The checklists will identify measures that will be implemented to protect or conserve plants, animals, fish or marine life as necessary.

3. How would the proposal be likely to deplete energy or natural resources?

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities will address the needs identified in the plan will include lift stations and wastewater treatment facilities with mechanical equipment. The lift stations and wastewater treatment facilities will rely on electricity for power.

Proposed measures to protect or conserve energy and natural resources are:

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Energy efficient motors, pumps and mechanical equipment will be utilized in future projects to conserve energy and natural resources.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities will address the needs identified in the plan will not be sited in environmentally sensitive areas or areas designated for governmental protection.

Proposed measures to protect such resources or to avoid or reduce impacts are:

Sites for new facilities will be selected to ensure environmentally sensitive and protected areas are not utilized for the proposed lift station upgrades and wastewater treatment facility improvements.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities will address the needs identified in the plan will be sited in designated

land use areas that allow the siting of public utilities. New wastewater treatment facilities will not be located in the shoreline.

Proposed measures to avoid or reduce shoreline and land use impacts are:

Sites for new facilities will be located in appropriate land use areas. If repair/replacement of the existing sewer or outfalls in shorelines is planned construction mitigation measures will be incorporated into the plans and specifications to minimize the impact on shorelines during construction.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities identified in the plan are unlikely to increase demands on transportation, public services and utilities.

Proposed measures to reduce or respond to such demand(s) are:

Energy efficient pumps, motors and mechanical equipment will be incorporated into the lift station and wastewater treatment upgrades to minimize the increase in electrical energy needed to operate the facilities.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The General Sewer/Wastewater Facility Plan, the subject of this checklist is a planning document. Future projects that will address the upgrade or replacement of sewer conveyance and treatment facilities identified in the plan will not conflict with local, state or federal laws. Future projects will meet local, state and federal laws for wastewater conveyance and treatment and protection of the environment. The driving force behind upgrades to the existing conveyance and treatment facilities is to be in compliance with the federal Clean Water Act and the State of Washington Department of Ecology Washington State regulations relating to the prevention and control of discharge of pollutants into waters of the state, anti-degradation of existing and future beneficial uses of groundwater, and anti-degradation of surface water. .

APPENDIX B

SEKIU WWTP NPDES PERMIT AND CLALLAM BAY WWTP NPDES PERMIT

DRAFT

Issuance Date: _____
Effective Date: July 1, 2007
Expiration Date: June 30, 2012

WASHINGTON STATE DEPARTMENT OF ECOLOGY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT NO. WA0024431

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 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 1251 et seq.

Clallam Bay Publicly Owned Treatment Works

Administered by Clallam County Public Works Department

223 East Fourth Street, Suite 6

Port Angeles, WA 98362-3015

Plant Location: 410 Frontier Street, Clallam Bay, WA 98362 South of Slip Pt. Clallam Bay	Receiving Water: Strait of Juan de Fuca
Water Body I.D. No.: 48124C2G5	Discharge Location: Latitude: 48° 15' 44" N Longitude: 124° 15' 21" W
Plant Type: Rotating Biological Contactor (RBC) with UV Disinfection	

is authorized to discharge in accordance with the special and general conditions that follow.

Kelly Susewind, P.E., P.G.
Southwest Regional Manager
Water Quality Program
Washington State Department of Ecology

TABLE OF CONTENTS

GENERAL CONDITIONS

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.	Discharge Monitoring Report	Monthly	August 15, 2007
S3.E	Noncompliance Notification	As necessary	
S3.F	Shellfish Protection	As necessary	
S4.B.	Plans for Maintaining Adequate Capacity	As necessary	
S4.C.	Notification of New or Altered Sources	As necessary	
S4.E.	Infiltration and Inflow Evaluation	Annually	March 31, 2008
S4.F.	Wasteload Assessment	Annually	March 31, 2008
S5.	Operations and Maintenance Manual Update	1/permit	May 15, 2009
S8.	Outfall Evaluation	1/permit	May 15, 2009
G1.	Notice of Change in Authorization	As necessary	
G4.	Permit Application for Substantive Changes to the Discharge	As necessary	
G5.	Engineering Report for Construction or Modification Activities	As necessary	
G7.	Application for Permit Renewal	1/permit cycle	December 31, 2011
G21	Notice of Planned Changes	As necessary	
G22	Reporting Anticipated Non-compliance	As necessary	

SPECIAL CONDITIONS

S1. DISCHARGE LIMITATIONS

A. Effluent Limitations

All discharges and activities authorized by this permit shall be consistent 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 shall constitute a violation of the terms and conditions of this permit.

Beginning on the effective date of this permit and lasting through the expiration date, the Permittee is authorized to discharge municipal wastewater at the permitted location subject to complying with the following limitations:

	EFFLUENT LIMITATIONS[a]: OUTFALL # 001	
Parameter	**Average Monthly**	**Average Weekly**
five-day Biochemical Oxygen Demand (BOD_5)[b]	30 mg/L, 20 lbs/day 85% Removal	45 mg/L, 30 lbs/day
Total Suspended Solids (TSS)[b]	30 mg/L, 26 lbs/day 85% Removal	45 mg/L, 39 lbs/day
Fecal Coliform Bacteria	200/100 mL	400/100 mL
pH[c]	Daily minimum is equal to or greater than 6.0 and the daily maximum is less than or equal to 9.0	
[a]The average monthly and weekly effluent limitations are based on the arithmetic mean of the samples taken with the exception of fecal coliform, which is based on the geometric mean.		
[b]The average monthly effluent concentration for BOD_5 and Total Suspended Solids shall not exceed 30 mg/L or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.		
[c]Indicates the range of permitted values.		

B. Mixing Zone Descriptions

The maximum boundaries of the mixing zones are defined as follows: the chronic mixing zone boundary extends in a horizontal direction from any discharge port to a maximum of 218 feet (66.4 meters). The acute mixing zone boundary extends in a horizontal direction from any discharge port to a maximum of 21.8 feet (6.64 meters).

S2. MONITORING REQUIREMENTS

A. Monitoring Schedule

Parameter	Units	Sample Point	Minimum Sampling Frequency	Sample Type
BOD_5	mg/L lbs/day	Influent	1/week	24-hour composite
TSS	mg/L lbs/day	Influent	1/week	24-hour composite
Parameter	**Units**	**Sample Point**	**Minimum Sampling Frequency**	**Sample Type**
Flow	MGD	Effluent	Continuous[(a)]	Recording
BOD_5	mg/L lbs/day	Effluent	1/week	24-hour composite
	% (mg/L) removed from influent		1/week	Calculation
TSS	mg/L lbs/day	Effluent	1/week	24-hour composite
	% (mg/L) removed from influent		1/week	Calculation
pH	Standard Units	Effluent	5/week	Grab
Fecal Coliform	Col./100 mL	Effluent	1/week	Grab

[(a)] Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance. Sampling shall be taken daily when continuous monitoring is not possible.

B. Sampling and Analytical Procedures

Samples and measurements taken to meet the requirements of this permit shall be representative of the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets and maintenance-related conditions affecting effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit shall 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 to the latest revision of *Standard Methods for the Examination of Water and Wastewater* (APHA), unless otherwise specified in this permit or approved in writing by the Department of Ecology (Department).

C. Flow Measurement

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the quantity of monitored flows. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements are consistent with the accepted industry standard for that type of device. Frequency of calibration shall be in conformance with manufacturer's recommendations and at a minimum frequency of at least one calibration per year. Calibration records shall be maintained for at least three years.

D. Laboratory Accreditation

All monitoring data required by the Department shall be prepared by a laboratory registered or accredited under the provisions of, *Accreditation of Environmental Laboratories*, Chapter 173-50 Washington Administrative Code (WAC). Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement. Conductivity and pH shall be accredited if the laboratory must otherwise be registered or accredited. The Department exempts crops, soils, and hazardous waste data from this requirement pending accreditation of laboratories for analysis of these media.

S3. REPORTING AND RECORDKEEPING REQUIREMENTS

The Permittee shall monitor and report in accordance with the following conditions. The falsification of information submitted to the Department shall constitute a violation of the terms and conditions of this permit.

A. Reporting

The first monitoring period begins on the effective date of the permit. Monitoring results shall be submitted monthly. Monitoring data obtained during each monitoring period shall be summarized, reported, and submitted on a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by the Department. DMR forms shall be received by the Department no later than the 15th day of the month following the completed monitoring period, unless otherwise specified in this permit. Priority pollutant analysis data shall be submitted no later than 45 days following the monitoring period. Unless otherwise specified, all toxicity test data shall be submitted within 60 days after the sample date. The report(s) shall be sent to the Department of Ecology, Southwest Regional Office, P.O. Box 47775, Olympia, Washington 98504-7775.

DMR forms must be submitted monthly whether or not the facility was discharging. If there was no discharge during a given monitoring period, submit the form as required with the words "No Discharge" entered in place of the monitoring results.

B. Records Retention

The Permittee shall retain records of all monitoring information for a minimum of three years. Such information shall 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. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by the Department.

C. Recording of Results

For each measurement or sample taken, the Permittee shall 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; and (6) the results of all analyses.

D. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit using test procedures specified by Condition S2 of this permit, then the results of such monitoring shall be included in the calculation and reporting of the data submitted in the Permittee's DMR.

E. Noncompliance Notification

In the event the Permittee is unable to comply with any of the terms and conditions of this permit due to any cause, the Permittee shall:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance, correct the problem and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to the Department within 30 days after becoming aware of the violation.

2. Immediately notify the Department of the failure to comply.

3. Submit a detailed written report to the Department within 30 days (five days for upsets and bypasses), unless requested earlier by the Department. The report shall contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

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.

F. Reporting - Shellfish Protection

Unauthorized discharges such as collection system overflows, plant bypasses, failure of the disinfection system, or any single effluent fecal coliform sample which exceeds 20,000 org/100 mL shall be reported immediately to the Department of Ecology and the Department of Health, Shellfish Program. The Department of Ecology's Southwest Regional Office 24-hour number is (360) 407-6300, and the Department of Health's Shellfish 24-hour number is (360) 236-3330.

S4. FACILITY LOADING

A. Design Criteria

Flows or waste loadings of the following design criteria for the permitted treatment facility shall not be exceeded:

Average flow for the maximum month:	0.12 mgd
Average BOD_5 loading for maximum month:	135 lbs/day
Average TSS loading for maximum month:	171 lbs/day

B. Plans for Maintaining Adequate Capacity

When the actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three consecutive months, or when the projected increases would reach design capacity within five years, whichever occurs first, the Permittee shall submit to the Department, a plan and a schedule for continuing to maintain capacity at the facility sufficient to achieve the effluent limitations and other conditions of this permit. This plan shall address any of the following actions or any others necessary to meet this objective.

1. Analysis of the present design including the introduction of any process modifications that would establish the ability of the existing facility to achieve the effluent limits and other requirements of this permit at specific levels in excess of the existing design criteria specified in paragraph A above.

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

3. Limitation on future sewer extensions or connections or additional waste loads.

4. Modification or expansion of facilities necessary to accommodate increased flow or waste load.

5. Reduction of industrial or commercial flows or waste loads to allow for increasing sanitary flow or waste load.

Engineering documents associated with the plan must meet the requirements of WAC 173-240-060, "Engineering Report," and be approved by the Department prior to any construction. The plan shall specify any contracts, ordinances, methods for financing, or other arrangements necessary to achieve this objective.

C. Duty to Mitigate

The Permittee is required to 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

The Permittee shall submit written notice to the Department whenever any new discharge or a substantial change in volume or character of an existing discharge into the publicly owned treatment works (POTW) is proposed which: (1) would interfere with the operation of, or exceed the design capacity of, any portion of the POTW; (2) is not part of an approved general sewer plan or approved plans and specifications; or (3*)* would be subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act. This notice shall include an evaluation of the POTW'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 POTW, and the anticipated impact on the Permittee's effluent [40 CFR 122.42(b)].

E. Infiltration and Inflow Evaluation

1. The Permittee shall 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: Publications Office, Department of Ecology, P.O. Box 47600, Olympia, Washington 98504-7600. Plant monitoring records may be used to assess measurable infiltration and inflow.

2. A report shall be prepared which summarizes any measurable infiltration and inflow. If infiltration and inflow have increased by more than 15 percent from that found in the first report based on equivalent rainfall, the report shall contain a plan and a schedule for: (1) locating the sources of infiltration and inflow; and (2) correcting the problem.

3. Any infiltration or inflow identified in segments of the collection system which are under or adjacent to surface water shall be further characterized for the existence of exfiltration.

4. The infiltration and inflow report shall be submitted by **March 31, 2008,** and **annually** thereafter.

F. Waste load Assessment

The Permittee shall conduct an annual assessment of their flow and waste load and submit a report to the Department by **March 31, 2008**, and **annually** thereafter. The report shall contain the following: an indication of compliance or noncompliance with the permit effluent limitations; a comparison between the existing and design monthly average dry weather and wet weather flows, peak flows, BOD, and total suspended solids loadings; and (except for the first report) the percentage increase in these parameters since the last annual report. The report shall also state the present and design population or population equivalent, projected population growth rate, and the estimated date upon which the design capacity is projected to be reached, according to the most restrictive of the parameters above. The interval for review and reporting may be modified if the Department determines that a different frequency is sufficient.

S5. OPERATION AND MAINTENANCE

The Permittee shall 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 adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of this permit. An updated Operation and Maintenance (O&M) Manual is due once during this permit on **May 15, 2009**.

A. Certified Operator

An operator certified for at least a Class II plant by the state of Washington shall 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 shall be in charge during all regularly scheduled shifts.

B. O & M Program

The Permittee shall institute an adequate operation and maintenance program for their entire sewage system. Maintenance records shall be maintained on all major electrical and mechanical components of the treatment plant, as well as the sewage system and pumping stations. Such records shall clearly specify the frequency and type of maintenance recommended by the manufacturer and shall show the frequency and type of maintenance performed. These maintenance records shall be available for inspection at all times.

C. Short-term Reduction

If a Permittee contemplates a reduction in the level of treatment that would cause a violation of permit discharge limitations on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee shall give written notification to the Department, if possible, 30 days prior to such activities, detailing 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 their obligations under this permit.

D. Electrical Power Failure

The Permittee is responsible for maintaining adequate safeguards to 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 either by means of alternate power sources, standby generator, or retention of inadequately treated wastes. The Permittee shall maintain Reliability Class II (EPA 430-99-74-001) at the wastewater treatment plant, which requires primary sedimentation and disinfection.

E. Prevent Connection of Inflow

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

F. Bypass Procedures

Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited, and the Department may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, or 3) is applicable.

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

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health as determined by the Department prior to the bypass. The Permittee shall submit prior notice, if possible at least ten days before the date of the bypass.

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

   This bypass is permitted 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. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.

   c. The Department is properly notified of the bypass as required in Condition S3E of this permit.

3. Bypass which is anticipated and has the potential to result in noncompliance of this permit

   The Permittee shall notify the Department at least 30 days before the planned date of bypass. The notice shall contain: (1) a description of the bypass and its cause; (2) an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing; (3) a cost-effectiveness analysis of alternatives including comparative resource damage assessment; (4) the minimum and maximum duration of bypass under each alternative; (5) a recommendation as to the preferred alternative for conducting the bypass; (6) the projected date of bypass initiation; (7) a statement of compliance with State Environmental Policy Act (SEPA); (8) a request for modification of water quality standards as provided

for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated; and (9) steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above shall be considered during preparation of the engineering report or facilities plan and plans and specifications and shall be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

The Department will consider the following prior to issuing an administrative order for this type bypass:

a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

b. If there are feasible alternatives to bypass, 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.

c. If the bypass is planned and scheduled 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, the Department will approve or deny the request. The public shall be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by the Department under Revised Code of Washington (RCW) 90.48.120.

G. Operations and Maintenance Manual

The approved O&M Manual shall be kept available at the treatment plant and all operators shall follow the instructions and procedures of this manual.

S6. PRETREATMENT

A. General Requirements

The Permittee shall work with the Department to ensure that all commercial and industrial users of the Publicly Owned Treatment Works (POTW) are in compliance with the pretreatment regulations promulgated in 40 CFR Part 403 and any additional regulations that may be promulgated under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act.

B. Wastewater Discharge Permit Required

The Permittee shall not allow significant industrial users (SIUs) to discharge wastewater to the Permittee's sewerage system until such user has received a wastewater discharge permit from the Department in accordance with Chapter 90.48 RCW and Chapter 173-216 WAC, as amended.

C. Duty to Enforce Discharge Prohibitions

1. In accordance with 40 CFR 403.5(a), the Permittee shall not authorize or knowingly allow the discharge of any pollutants into its POTW which cause pass through or interference, or which otherwise violates general or specific discharge prohibitions contained in 40 CFR Part 403.5 or WAC-173-216-060.

2. The Permittee shall 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, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

   e. Petroleum oil, nonbiodegradable 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°C (104°F) unless the Department, 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. All of the following are prohibited from discharge to the POTW unless approved in writing by the Department under extraordinary circumstances (such as a lack of direct discharge alternatives due to combined sewer service or the need to augment sewage flows due to septic conditions):

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 shall notify the Department if any industrial user violates the prohibitions listed in this section.

S7. RESIDUAL SOLIDS

Residual solids include screenings, grit, scum, primary sludge, waste activated sludge, and other solid waste. The Permittee shall store and handle all residual solids in such a manner so as to prevent their entry into state ground or surface waters. The Permittee shall not discharge leachate from residual solids to state surface or ground waters. The disposal of biosolids shall be conducted in accordance with WAC 173-308.

S8. OUTFALL EVALUATION

The Permittee shall inspect, the submerged portion of the outfall line and diffuser to document its integrity and continued function once during the permit cycle. If conditions allow for a photographic verification, it shall be included in the report. By **May 15, 2009**, the inspection report shall be submitted to the Department.

GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

All applications, reports, or information submitted to the Department shall be signed and certified.

A. All permit applications shall be signed by either a principal executive officer or a ranking elected official.

B. All reports required by this permit and other information requested by the Department shall 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 the Department.

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 B.2 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 B.2 above must be submitted to the Department 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 shall 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 shall allow an authorized representative of the Department, 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 the Department's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 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 [40 CFR part 122.64(3)].

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 [40 CFR part 122.64(4)].

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. The Department 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. Cause exists for termination for reasons listed in A1 through A7 of this section, and the Department determines that modification or revocation and reissuance is appropriate.

2. The Department 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 G8) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

G4. REPORTING A CAUSE FOR MODIFICATION

The Permittee shall submit a new application, or a supplement to the previous application, along with required engineering plans and reports whenever a material change to the facility or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application shall be submitted at least 60 days prior to any proposed changes. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G5. PLAN REVIEW REQUIRED

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

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit shall be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. DUTY TO REAPPLY

The Permittee shall apply for permit renewal by **December 31, 2011**.

G8. TRANSFER OF THIS PERMIT

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

A. Transfers by Modification

Except as provided in paragraph (B) 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.

B. Automatic Transfers

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

1. The Permittee notifies the Department at least 30 days in advance of the proposed transfer date.

2. 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.

3. The Department 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.

G9. REDUCED PRODUCTION FOR COMPLIANCE

The Permittee, in order to maintain compliance with its permit, shall 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.

G10. REMOVED SUBSTANCES

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

G11. DUTY TO PROVIDE INFORMATION

The Permittee shall submit to the Department, within a reasonable time, all information which the Department 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 shall also submit to the Department upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G12. OTHER REQUIREMENTS OF 40 CFR

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

G13. ADDITIONAL MONITORING

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

G14. PAYMENT OF FEES

The Permittee shall submit payment of fees associated with this permit as assessed by the Department.

G15. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be 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 shall 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 shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G16. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations 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 limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was

being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in Condition S3.E; and 4) the Permittee complied with any remedial measures required under S5 of this permit.

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

G17. PROPERTY RIGHTS

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

G18. DUTY TO COMPLY

The Permittee shall 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.

G19. TOXIC POLLUTANTS

The Permittee shall 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.

G20. 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.

G21. REPORTING PLANNED CHANGES

The Permittee shall, as soon as possible, give notice to the Department of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in: 1) the permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b); 2) a significant change in the nature or an increase in quantity of pollutants discharged; or 3) a significant change in the Permittee's sludge use or disposal practices. Following such notice, 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 of the terms and conditions of this permit.

G22. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee shall give advance notice to the Department by submission of a new application or supplement thereto at least 180 days prior to commencement of such discharges, of any facility

expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, shall be scheduled during noncritical water quality periods and carried out in a manner approved by the Department.

G23. REPORTING OTHER INFORMATION

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 the Department, it shall promptly submit such facts or information.

G24. 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 shall be submitted no later than 14 days following each schedule date.

APPENDIX C

CLALLAM COUNTY MUNICIPAL CODE SEWER CHAPTER

Chapter 13.04
CLALLAM BAY/SEKIU SEWERAGE RATE SCHEDULE

Sections:

SOURCE: ADOPTED:
Ord. 738 06/03/03

AMENDED SOURCE: ADOPTED:
Ord. 782 11/01/05
Ord. 842 03/03/09
Ord. 914 11/22/16

13.04.010 Purpose.

The purpose of this chapter is to provide for fair and equitable charges for sanitary sewage service to both old and new customers. All customers should pay for the services they receive and, therefore, no customer should receive any service at the expense of other customers. In achieving the foregoing it is necessary to maintain the fiscal integrity of the Clallam Bay/Sekiu Sewerage System.

13.04.020 Definitions.

(1) “Sewerage district” means Clallam Bay/Sekiu Sewerage District.

(2) “Sewer district property owners” means those persons or entities that possess a deed to property within the sewerage district boundaries or receive Clallam Bay/Sekiu sewerage service outside of said district boundaries.

(3) “Hook up” means any connection to the sewerage district.

(4) “Monthly” means each calendar month.

(5) “Commercial accounts” means a building and/or use of property for the purpose of generating revenue for the owner or lessee.

(6) “Dwelling unit” means a unit providing independent living facilities for one or more persons with provisions for eating, sleeping, and sanitation.

(7) “Government accounts” means any governmental agency user of the sewerage system.

(8) “Standard participation” means properties outside of the sewerage district boundaries that purchase sewerage rights through connect fees.

(9) “Basic rate” means basic service rate per month to include 700 cubic feet per month of water usage for sewerage rate calculation.

13.04.030 Rate schedule.

(1) Commercial and Government.

(a) From the first day of the month immediately following the effective date of the ordinance codified in this chapter through December 31, 2017:

(i) $53 basic.

(ii) $0.07 per cubic foot over 700 cubic feet per month.

(b) From January 1, 2018, through December 31, 2018:

(i) $55 basic.

(ii) $0.07 per cubic foot over 700 cubic feet per month.

(c) From January 1, 2019:

(i) $56.50 basic.

(ii) $0.07 per cubic foot over 700 cubic feet per month.

(2) Dwelling Units.

(a) From the first day of the month immediately following the effective date of the ordinance codified in this chapter through December 31, 2017:

(i) $47.50 basic.

(ii) $0.07 per cubic foot over 700 cubic feet per month.

(b) From January 1, 2018 through December 31, 2018:

(i) $49 basic.

(ii) $0.07 per cubic foot over 700 cubic feet per month.

(c) From January 1, 2019:

(i) $51 basic.

(ii) $0.07 per cubic foot over 700 cubic feet per month.

13.04.040 New connection assessment.

Whenever any person or entity desires to connect to the existing Clallam Bay/Sekiu sewerage system, such person or entity is required to pay the following fees:

(1) $1,500 connection to system.

(2) $75 inspection.

(3) Standard Participation. For a property to receive sewerage service outside of the Clallam Bay/Sekiu sewage district boundaries a fee of $3,000 will be assessed.

13.04.050 Repeal of prior fees.

The fees set in this chapter supersede any prior fees set by ordinance or resolution, specifically Ordinance No. 842 adopted March 3, 2009, for the administrative services covered herein.

13.04.060 Severability.

If any provision of this chapter is held invalid by a court of competent jurisdiction, the remaining provisions shall remain valid.

13.04.070 Effective date.

This chapter shall take effect 10 days from adoption of the ordinance codified in this chapter. The new rates shall take effect upon the first day of the first month following the adoption of the ordinance codified in this chapter.

APPENDIX D

MONTHLY DISCHARGE MONITORING REPORT DATA

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month January | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK			5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal		pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0333										6.20	
2					0.0338										6.15	
3					0.0395										6.38	
4					0.0302										6.27	
5					0.0805										6.20	
6					0.0737							E4	6.5		6.04	20.15
7	89.93	40.73	70.5	31.93	0.0543	10.4	88	4.7	11.7	83	5.3				6.22	
8					0.0554										6.28	
9					0.0432										6.19	
10					0.038										6.01	
11					0.0381										6.30	
12					0.0585										6.21	
13					0.0311							E2	5.5		6.22	7.91
14	214.38	49.70	174.34	40.42	0.0278	12.51	94	2.9	14.6	92	3.4				6.28	
15					0.0296										6.17	
16					0.0373										6.15	
17					0.0401										6.31	
18					0.0697										6.19	
19					0.0726										6.00	
20					0.0619							29	5.5		6.28	92.98
21	136.56	58.65	65.57	28.16	0.0515	13.35	90	5.7	16.17	75	6.9				6.20	
22					0.0455										6.11	
23					0.0452										6.15	
24					0.0613										6.02	
25					0.0500										6.16	
26					0.0491										6.25	
27					0.0401							27	10		6.12	71.05
28	164.78	48.65	123	36.31	0.0354	10.37	94	3.1	13.07	89	3.9				6.20	
29					0.0326										6.21	
30					0.0302										6.09	
31					0.0358										6.23	
Total	605.65	197.733	433.41	136.825	1.4253	46.63	366.531	16.41	55.54	339.74	19.49	56	27.5		191.8	
	AVE 151.41	AVG 49.43	AVG 108.35	AVG 34.21	AVG 0.046	AVG 11.66	AVG 92.30	AVG 4.10	AVG 13.89	AVE 87.19	AVE 4.87	GEM 9	AVG 6.88		MIN 6.00	
Permit		135		171	0.12	30	85	20	30	85	26	200			6	
	MAX 214.38	MAX 58.65	MAX 174.34	MAX 40.42	MAX 0.081	AVW 13.35		AVW 5.73	AVW 16.17		AVE 6.95	GMI 29	AVG		MAX 6.38	
Limits						45		30	45		39	400			9	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GM7=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

CORRECTED VERSION

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	4	2	29	27	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.60205999	0.30103	1.462398	1.43136376	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.60205999	0.30103	1.462398	1.43136376	#DIV/0!
Week Avg:	**4**	**2**	**29**	**27**	**#DIV/0!**

Month Avg (log)	0.94921294
Month Avg:	**9**
HIGHEST WEEKLY	**29**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month February | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0336									6.31	
2					0.0309									6.16	
3					0.0209							E36	5	6.33	58.20
4	197.82	45.70	162.67	37.5797	0.0277	10.07	95	2.3	10.56	94	2.4			6.30	
5					0.0478									6.44	
6					0.0889									6.05	
7					0.0914									6.02	
8					0.073									6.02	
9					0.0705									6.17	
10					0.0612							E2	7.5	6.15	28.01
11	117.57	49.03	118.34	49.35	0.050	9.24	92	3.9	12.13	90	5.1			6.08	
12					0.0451									6.04	
13					0.0526									6.02	
14					0.0473									6.11	
15					0.0383									6.04	
16					0.0375									6.11	
17					0.040							50	6	6.34	67.57
18	154.95	40.71	110.5	29.03	0.0315	5.86	96	1.5	6.14	94	1.6			6.10	
19					0.0317									6.00	
20					0.031									6.18	
21					0.0361									6.03	
22					0.027									6.30	
23					0.0329									6.16	
24					0.026							68	6	6.08	51.61
25	239.1	46.26	288	55.72	0.0232	11.42	95	2.2	13.58	95	2.6			6.34	
26					0.0265									6.06	
27					0.0415									6.27	
28					0.0361									6.23	
29															
30															
31															
Total	709.44	181.697	679.51	171.681	1.2002	36.59	378.492	9.929	42.41	372.99	11.74	118	24.5	172.4	
	AVG 177.36	AVG 45.42	AVG 169.88	AVG 42.92	AVG 0.043	AVG 9.15	AVG 94.84	AVG 2.48	AVG 10.60	AVI 93.76	AVG 2.93	GEM 22	AVG 6.13	MIN 6.00	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 239.10	MAX 49.03	MAX 288.00	MAX 55.72	MAX 0.091	AVW 11.42		AVW 3.85	AVW 13.58		AVG 5.06	GMT 68	AVW	MAX 6.44	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	36	2	50	68	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.5563025	0.30103	1.69897	1.83250891	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.5563025	0.30103	1.69897	1.83250891	#DIV/0!
Week Avg:	**36**	**2**	**50**	**68**	**#DIV/0!**

Month Avg (log) 1.34720285

Month Avg:	**22**
HIGHEST WEEKLY	**68**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nı WA0024431 | Month March | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T) RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0218									6.25	
2					0.0417									6.44	
3					0.0257							E434	5.5	6.25	70.28
4	224.18	43.38	183.5	35.51	0.0232	9.72	96	1.9	10.5	94	2.0	E6	6.5	6.30	5.06
5					0.027									6.25	
6					0.0257									6.03	
7					0.0258									6.44	
8					0.0229									6.33	
9					0.0294									6.33	
10					0.0236							E9	5	6.22	18.52
11	259.9	52.02	241	48.24	0.024	9.39	96	1.9	11.89	95	2.4			6.31	
12					0.0262									6.13	
13					0.029									6.38	
14					0.0242									6.41	
15					0.0303									6.18	
16					0.0527									6.17	
17					0.0341							E30	4	6.28	87.75
18	143.82	36.22	110	27.71	0.0302	7.89	95	2.0	7.89	93	2.0			6.15	
19					0.0307									6.13	
20					0.0517									6.11	
21					0.0604									6.16	
22					0.051									6.21	
23					0.050									6.22	
24					0.0433							E7	4.5	6.08	12.05
25	158.75	54.0182	128	43.55	0.0408	8.2	95	2.8	12.83	90	4.4			6.30	
26					0.0493									6.02	
27					0.0416									6.28	
28					0.0473									6.22	
29					0.0411									6.17	
30					0.0501									6.03	
31					0.044							E13	6	6.31	46.68
Total	786.65	185.64	662.5	155.004	1.1188	35.2	381.4	8.538	43.11	372.15	10.76	0	31.5	193.1	
	AVG 196.66	AVG 46.41	AVG 165.63	AVG 38.75	AVG 0.036	AVG 8.80	AVG 95.53	AVG 2.13	AVG 10.78	AVI 93.49	AVG 2.69	GEM 22	AVG 5.25	MIN 6.02	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 259.90	MAX 54.02	MAX 241.00	MAX 48.24	MAX 0.060	AVW 9.72		AVW 2.79	AVW 12.83		AVI 4.37	GMT 51	AVG	MAX 6.44	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	434	9	30	7	
Day 4 (CFU/100 mL)	6				
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	2.63748973	0.95424251	1.47712125	0.84509804	
Day 4 (log)	0.77815125				
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.70782049	0.95424251	1.47712125	0.84509804	#DIV/0!
Week Avg:	**51**	**9**	**30**	**7**	**#DIV/0!**

Month Avg (log) 1.33842056

Month Avg:	**22**
HIGHEST WEEKLY	**51**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month April | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1	88.82	30.07	88.5	29.97	0.0406	6.93	92	2.3	14.5	84	4.9			6.21	
2					0.0392									6.08	
3					0.0523									6.28	
4					0.0442									6.28	
5					0.0493									6.15	
6					0.053									6.40	
7					0.0338							E7	5.5	6.26	40.74
8	162.77	37.87	129	30.02	0.0279	5.68	97	1.3	7.67	94	1.8			6.04	
9					0.0303									6.31	
10					0.0266									6.02	
11					0.04									6.30	
12					0.0336									6.25	
13					0.0325									6.30	
14					0.0354							E37	9.5	6.22	34.33
15	182.1	48.90	154.5	41.49	0.0322	8.53	95	2.3	14.78	90	4.0			6.12	
16					0.0424									6.57	
17					0.035									6.09	
18					0.0346									6.52	
19					0.0251									6.23	
20					0.0328									6.38	
21					0.0265							E7	10	6.30	30.73
22	315.8	77.17	384.67	94.00	0.0293	8.75	97	2.1	14.44	96	3.5			6.25	
23					0.027									6.17	
24					0.0241									6.19	
25					0.0365									6.27	
26					0.0248									6.23	
27					0.0274							E1267	6.5	6.15	78.47
28	218.05	42.55	151.5	29.57	0.0234	14.28	93	2.8	29.44	81	5.7	E6	5.5	6.09	7.19
29					0.0229									6.31	
30					0.0247									6.09	
31															
Total	967.54	236.575	908.17	225.038	1.0074	44.17	474.704	10.88	80.83	444.92	19.94	0	37	187.1	
	AVG 193.51	AVG 47.31	AVG 181.63	AVG 45.01	AVG 0.034	AVG 8.83	AVG 95.43	AVG 2.18	AVG 16.17	AVG 91.10	AVG 3.99	GEM 27	AVG 7.40	MIN 6.02	
Permit		135		171	0.12	30	85	20	30	85	26	200		6	
	MAX 315.80	MAX 77.17	MAX 384.67	MAX 94.00	MAX 0.053	AVW 14.28		AVW 2.79	AVW 29.44		AVL 5.75	GMI 87	AVW	MAX 6.57	
Limits						45		30	45		39	400		9	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMI=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 imprisionment for knowing violations.

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	7	37	7	1267	
Day 4 (CFU/100 mL)				6	
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.84509804	1.56820172	0.84509804	3.10277661	
Day 4 (log)				0.77815125	
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.84509804	1.56820172	0.84509804	1.94046393	#DIV/0!
Week Avg:	**7**	**37**	**7**	**87**	**#DIV/0!**

Month Avg (log) 1.42786513

Month Avg:	**27**
HIGHEST WEEKLY	**87**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nı WA0024431 | Month May | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0311									6.44	
2					0.0283									6.01	
3					0.021									6.07	
4					0.026									6.26	
5					0.0237							142	14	6.20	38.01
6	215.1	45.57	167.67	35.52	0.0254	9.44	96	2.0	13	92	2.8			6.08	
7					0.0238									(5.91)	
8					0.0269									6.11	
9					0.0261									6.19	
10					0.0216									6.30	
11					0.0221									6.10	
12					0.0214							34	5	6.29	72.08
13	263.4	46.79	200	35.53	0.0213	9.18	97	1.6	12.89	94	2.3			6.29	
14					0.0253									6.34	
15					0.0306									6.33	
16					0.0244									6.41	
17					0.0239									6.18	
18					0.0245									6.21	
19					0.022							E4	7	6.24	10.75
20	234.79	40.34	215.34	37.00	0.0206	11.31	95	1.9	17.06	92	2.9			6.32	
21					0.0306									6.43	
22					0.0297									6.30	
23					0.0255									6.22	
24					0.0264									6.21	
25					0.0319									6.30	
26					0.0242							E18	9	6.51	17.49
27	281.12	50.1732	228	40.69	0.0214	12.51	96	2.2	18.11	92	3.2			6.19	
28					0.0215									6.31	
29					0.0261									6.41	
30					0.0257									6.33	
31					0.0193									6.31	
Total	994.41	182.868	811.01	148.736	0.7723	42.44	382.859	7.806	61.06	369.94	11.21	176	35	6.19	
	AVG 248.60	AVG 45.72	AVG 202.75	AVG 37.18	AVG 0.025	AVG 10.61	AVG 95.73	AVG 1.95	AVG 15.27	AVG 92.47	AVG 2.80	GEM 24	AVG 8.75	MIN (5.91)	
Permit		135		171	0.12	30	85	20	30	85	26	200		6	
	MAX 281.12	MAX 50.17	MAX 228.00	MAX 40.69	MAX 0.032	AVW 12.51		AVW 2.23	AVW 18.11		AVG 3.23	GMT 142	AVW	MAX 6.51	
Limits						45		30	45		39	400		9	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Please Circle ALL Permit Violations **Mail to P.O. Box 47775, Olympia WA 98504-7775**

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	142	34	4	18	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	2.15228834	1.53147892	0.60205999	1.25527251	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	2.15228834	1.53147892	0.60205999	1.25527251	#DIV/0!
Week Avg:	**142**	**34**	**4**	**18**	**#DIV/0!**

Month Avg (log) 1.38527494

Month Avg:	**24**
HIGHEST WEEKLY	**142**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

ClallamBay–Sekiu P.O.T.W.

Clallam Bay – Sekiu P.O.T.W.
P.O. Box 243
Clallam Bay WA 98326

Permit No. Wa0024431

June 9, 2015

Department of Ecology
P.O. Box 47775
Olympia Wa 98504-7775

Dear Sir or Madam,

On 6/3/15 a sewage leak was discovered coming from a private sewer line. The leak was very small. (About 1 gallon a day) The owners were notified. The leak was repaired. The Department of Ecology, The Department of Health (Shell Fish), and Clallam County Environmental health were notified. Erts # 657223.

Please feel free to contact me if you have any questions.

Sincerely,

Kim Malakoff
Senior Operator
Clallam Bay – Sekiu P.O.T.W.

ClallamBay–Sekiu P.O.T.W.

Clallam Bay – Sekiu P.O.T.W.
P.O. Box 243
Clallam Bay WA 98326

Permit No. Wa0024449
Permit No. Wa0024431

June 4, 2015

Department of Ecology
P.O. Box 47775
Olympia Wa 98504-7775

Dear Sir or Madam,

On May 17th, 28th and May 30th low Ph values for the effluent were recorded at the Sekiu wastewater treatment plant. Hydrated lime was added to raise the Ph to above 6.00 and the effluent was retested.

Also on May 7th a low Ph value was recorded for the effluent at the Clallam Bay wastewater treatment plant. Hydrated lime was added to raise the Ph above 6.00 and the effluent was retested.

Please feel free to contact me if you have any questions.

Sincerely,

Kim Malakoff
Senior Operator
Clallam Bay – Sekiu P.O.T.W.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month June | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0267									6.35	
2					0.0206							E33	8.5	6.38	23.80
3	233.33	42.03	233.33	42.03	0.0216	17.33	93	3.1	17.33	93	3.1			6.44	
4					0.0217									6.32	
5					0.0281									6.48	
6					0.0206									6.39	
7					0.0215									6.21	
8					0.0219									6.35	
9					0.02							E13	8.5	6.31	47.31
10	361.34	59.37	361.34	59.37	0.0197	12.83	96	2.1	12.83	96	2.1			6.47	
11					0.0297									6.51	
12					0.0227									6.50	
13					0.0206									6.28	
14					0.0234									6.26	
15					0.0276									6.27	
16					0.0209							1334	13	6.34	65.21
17	207.34	35.97	207.34	35.97	0.0208	11.67	94	2.0	11.67	94	2.0	E33	4	6.44	9.21
18					0.0303									6.34	
19					0.0259									6.64	
20					0.023									6.15	
21					0.0275									6.45	
22					0.0233									6.41	
23					0.0208							29	5.5	6.25	30.40
24	245.67	37.49	245.67	37.49	0.0183	8.55	97	1.3	8.55	97	1.3			6.16	
25					0.0205									6.44	
26					0.026									6.34	
27					0.0191									6.45	
28					0.0194									6.23	
29					0.0325									6.50	
30					0.0189							E12	7.5	6.27	13.20
31															
Total	1047.68	174.863	1047.68	174.863	0.6936	50.38	379.913	8.559	50.38	379.91	8.559	1363	47	190.9	
	AVG 261.92	AVG 43.72	AVG 261.92	AVG 43.72	AVG 0.023	AVG 12.60	AVG 95.19	AVG 2.14	AVG 12.60	AVG 95.19	AVG 2.14	GEM 43	AVG 7.83	MIN 6.15	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 361.34	MAX 59.37	MAX 361.34	MAX 59.37	MAX 0.033	AVW 17.33		AVW 3.12	AVW 17.33		AVW 3.12	GMT 210	AVW	MAX 6.64	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisionment for knowing violations.

Please Circle ALL Permit Violations **Mail to P.O. Box 47775, Olympia WA 98504-7775**

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	33	13	1334	29	12
Day 4 (CFU/100 mL)			33		
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					12
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.51851394	1.11394335	3.12515583	1.462398	1.07918125
Day 4 (log)			1.51851394		
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.51851394	1.11394335	2.32183488	1.462398	1.07918125
Week Avg:	**33**	**13**	**210**	**29**	**12**

Month Avg (log) 1.63628438

Month Avg:	**43**
HIGHEST WEEKLY	**210**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N: WA0024431 | Month July | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T) RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1	257.86	41.08	225.67	35.95	0.0191	10.01	96	1.6	12.67	94	2.0			6.36	
2					0.0219									6.53	
3					0.0279									6.41	
4					0.0234									6.21	
5					0.0236									6.35	
6					0.0235									6.39	
7					0.0206							E140	8.5	6.56	39.71
8	280.78	47.77	223.67	38.05	0.0204	8.59	97	1.5	10.5	95	1.8			6.35	
9					0.0301									6.38	
10					0.029									6.35	
11					0.0263									6.21	
12					0.028									6.34	
13					0.0315									6.40	
14					0.0228							E12	8	6.26	15.73
15	286.83	48.32	246.34	41.50	0.0202	13.86	95	2.3	17.78	93	3.0			6.29	
16					0.0222									6.48	
17					0.0189									6.25	
18					0.0291									6.56	
19					0.0207									6.31	
20					0.0216									6.44	
21					0.0209							39	6	6.31	21.49
22	290.79	51.17	211.34	37.1903	0.0211	10.66	96	1.9	11.78	94	2.1			6.20	
23					0.0221									6.39	
24					0.028									6.33	
25					0.0277									6.32	
26					0.0252									6.42	
27					0.0315									6.32	
28					0.0217							E13	11.5	6.25	22.91
29	252.7	42.57	186.67	31.45	0.0202	16.19	94	2.7	24.86	87	4.2			6.38	
30					0.0206									6.30	
31					0.0211									6.18	
Total	1368.96	230.911	1093.69	184.141	0.7409	59.31	478.154	9.994	77.59	463.58	13.06	39	34	196.8	
	AVG 273.79	AVG 46.18	AVG 218.74	AVG 36.83	AVG 0.024	AVG 11.86	AVG 95.67	AVG 2.00	AVG 15.52	AVW 92.91	AVG 2.61	GEM 30	AVG 8.50	MIN 6.18	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 290.79	MAX 51.17	MAX 246.34	MAX 41.50	MAX 0.032	AVW 16.19		AVW 2.73	AVW 24.86		AVW 4.19	GMK 140	AVW	MAX 6.56	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMK=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	140	12	39	13	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	2.14612804	1.07918125	1.59106461	1.11394335	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	2.14612804	1.07918125	1.59106461	1.11394335	#DIV/0!
Week Avg:	**140**	**12**	**39**	**13**	**#DIV/0!**

Month Avg (log) 1.48257931

Month Avg:	**30**
HIGHEST WEEKLY	**140**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

Kim Malakoff

From: Kim Malakoff [cbcqpotw@olypen.com]
Sent: Tuesday, August 11, 2015 12:40 PM
To: Ginder, Kamilee (ECY)
Cc: Jones, Carl (ECY); Pat Bailey (pnor461@ecy.wa.gov)
Subject: Correctiv Action Letter

ClallamBay-Sekiu P.O.T.W.

Permit No. Wa0024431

Clallam Bay – Sekiu P.O.T.W.
P.O. Box 243
Clallam Bay WA 98326

August 11, 2015

Department of Ecology
Lab Accreditation Unit
P.O. Box 488
Manchester, Wa 98353-0488

Dear Kamilee Ginder,

The Clallam Bay – Sekiu wastewater treatment plant lab will do the following to prevent clerical errors in reporting lab performance audits.

BOD bench sheets will have a bold border framing the results of the BOD test. A second operator will check the results (when available).

The South West Regional Staff at the Department of Ecology has reviewed and approved of this corrective action.

Please feel free to contact me if you have any questions.

Sincerely,

Kim Malakoff
Senior Operator
Clallam Bay – Sekiu P.O.T.W.
360-963-2397

P.S. A PT for BOD has been ordered and will be completed by next week.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month August | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm	Instantaneous
1					0.0289									6.40		
2					0.0233									6.23		
3					0.0319									6.58		
4					0.0213							427	6.5	6.27	70.15	
5	263.95	49.31	180	33.63	0.0224	10.46	96	2.0	10.33	94	1.9	211	2.3	6.43	51.23	
6					0.0232									6.31		
7					0.0275							E20	8.5	6.27	27.71	
8					0.0207									6.43		
9					0.0256									6.23		
10					0.029									6.52		
11					0.0207							E3	3.5	6.29	15.21	
12	302.53	61.31	253	51.27	0.0243	14.6	95	3.0	20.72	92	4.2			6.37		
13					0.0242									6.22		
14					0.0197									6.40		
15					0.0289									6.32		
16					0.0224									6.33		
17					0.0317									6.59		
18					0.0215							240	13	6.34	40.24	
19	319.2	51.11	289.34	46.33	0.0192	12.08	96	1.9	21.94	92	3.5	46	14	6.36	28.20	
20					0.0199									6.45		
21					0.0282									6.37		
22					0.0201									6.32		
23					0.021									6.17		
24					0.0269									6.52		
25					0.027							E7	7	6.37	22.54	
26	295.45	54.95	243.34	45.26	0.0223	16.2	95	3.0	10.11	96	1.9			6.43		
27					0.0233									6.33		
28					0.0345									6.31		
29					0.0278									6.43		
30					0.0291									6.18		
31					0.0303									6.20		
Total	1181.13	216.683	965.68	176.489	0.7768	53.34	381.944	9.86	63.1	374.33	11.52	924	54.8	197		
	AVG 295.28	AVG 54.17	AVG 241.42	AVG 44.12	AVG 0.025	AVG 13.34	AVG 95.48	AVG 2.47	AVG 15.78	AVG 93.47	AVG 2.88	GEM 46	AVG 7.83	MIN 6.17		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**		
	MAX 319.20	MAX 61.31	MAX 289.34	MAX 51.27	MAX 0.035	AVG 16.2		AVG 3.01	AVG 21.94		AVG 4.20	GMT 122	AVG	MAX 6.59		
Limits						**45**		**30**	**45**		**39**	**400**		**9**		

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

CORRECTED

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024431 | Month September | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous	
1					0.0322							95	7.5	6.42	30.28	
2	276.11	66.09	226.34	54.18	0.0287	14.67	95	3.5	11.33	95	2.7			6.11		
3					0.0281									6.26		
4					0.0394									6.46		
5					0.0279									6.01		
6					0.0337									6.31		
7					0.0336									6.34		
8					0.0302							<1	4.5	6.34	17.61	
9	213.87	50.30	172	40.45	0.0282	12.63	94	3.0	10.55	94	2.5			6.43		
10					0.0394									6.37		
11					0.023									6.11		
12					0.0254									6.27		
13					0.0241									6.37		
14					0.0319									6.51		
15					0.0235							E24	6	6.33	26.55	
16	223.98	42.96	173	33.18	0.023	14.29	94	2.7	10.72	94	2.1			6.48		
17					0.0279									6.25		
18					0.0308									6.57		
19					0.0303									6.34		
20					0.0264									6.29		
21					0.04									6.47		
22					0.025							125	5	6.52	35.15	
23	281.3	55.84	298	59.15	0.0238	27.16	90	5.4	9.89	97	2.0			6.30		
24					0.0244									6.21		
25					0.042									6.38		
26					0.0273									6.38		
27					0.0327									6.34		
28					0.0284									6.21		
29					0.0248							E2	4.5	6.41	10.33	
30	246.42	41.92	201.34	34.26	0.0204	11.05	96	1.9	7.56	96	1.3			6.31		
31																
Total	1241.68	257.113	1070.68	221.219	0.8765	79.8	468.262	16.49	50.05	475.59	10.5	220	27.5	190.1		
	AVW 248.34	AVG 51.42	AVG 214.14	AVG 44.24	AVG 0.029	AVG 15.96	AVG 93.57	AVG 3.30	AVG 10.01	AVG 95.33	AVG 2.10	GEM 14	AVG 5.50	MIN 6.01		
Permit		135		171	0.12	30	85	20	30	85	26	200		6		
	MAX 281.30	MAX 66.09	MAX 298.00	MAX 59.15	MAX 0.042	AVG 27.16		AVG 5.39	AVG 11.33		AVG 2.71	GMA 125	AVG	MAX 6.57		
Limits						45		30	45		39	400		9		

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMA=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month September | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	PH STANDARD UNITS	Flow gpm Instantaneous
1					0.0322							95	7.5	6.42	30.28
2	276.11	66.09	226.34	54.18	0.0287	14.67	95	3.5	11.33	95	2.7			6.11	
3					0.0281									6.26	
4					0.0394									6.46	
5					0.0279									6.01	
6					0.0337									6.31	
7					0.0336									6.34	
8					0.0302							<1	4.5	6.34	17.61
9	213.87	50.30	172	40.45	0.0282	12.63	94	3.0	10.55	94	2.5			6.43	
10					0.0394									6.37	
11					0.023									6.11	
12					0.0254									6.27	
13					0.0241									6.37	
14					0.0319									6.51	
15					0.0235							E24	6	6.33	26.55
16	223.98	42.96	173	33.18	0.023	14.29	94	2.7	10.72	94	2.1			6.48	
17					0.0279									6.25	
18					0.0308									6.57	
19					0.0303									6.34	
20					0.0264									6.29	
21					0.04									6.47	
22					0.025							125	5	6.52	35.15
23	281.3	55.84	298	59.15	0.0238	27.16	90	5.4	9.89	97	2.0			6.30	
24					0.0244									6.21	
25					0.042									6.38	
26					0.0273									6.38	
27					0.0327									6.34	
28					0.0284									6.21	
29					0.0248							E2	4.5	6.41	10.33
30	246.42	41.92	201.34	34.26	0.0204	11.05	96	1.9	7.56	96	1.3			6.31	
31															
Total	1241.68	257.113	1070.68	221.219	0.8765	79.8	468.262	16.49	50.05	475.59	10.5	220	27.5	190.1	
	AVE 248.34	AVG 51.42	AVG 214.14	AVG 44.24	AVG 0.029	AVG 15.96	AVG 93.57	AVG 3.30	AVG 10.01	AVG 95.33	AVE 2.10	GEM 14	AVG 5.50	MIN 6.01	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 281.30	MAX 55.84	MAX 298.00	MAX 59.15	MAX 0.042	AVW 27.16		AVW 5.39	AVW 11.33		AVW 2.71	GMA 125	AVW	MAX 6.57	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMA=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	95	1	24	125	2
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					2
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.97772361	0	1.38021124	2.09691001	0.30103
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.97772361	0	1.38021124	2.09691001	0.30103
Week Avg:	**95**	**1**	**24**	**125**	**2**

Month Avg (log) 1.15117497

Month Avg:	**14**
HIGHEST WEEKLY	**125**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month October | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS	w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0297										6.33	
2					0.0205										6.33	
3					0.0233										6.20	
4					0.0217										6.39	
5					0.028										6.31	
6					0.0229							<1	8		6.34	15.18
7	238.52	50.73	210	44.66	0.0255	11.19	95	2.4	10.45	95	2.2				6.27	
8					0.0287										6.37	
9					0.0299										6.38	
10					0.0247										6.39	
11					0.0441										6.34	
12					0.0376										6.05	
13					0.0303							1334	8		6.41	66.81
14	258.25	52.98	188	38.57	0.0246	11.57	96	2.4	9.83	95	2.0	E7	4.5		6.35	4.05
15					0.0268										6.33	
16					0.032										6.34	
17					0.025										6.21	
18					0.0251										6.48	
19					0.0261										6.41	
20					0.0238							E13	5.5		6.38	24.82
21	305.5	58.60	285	54.67	0.023	9.1	97	1.7	8.89	97	1.7				6.41	
22					0.0309										6.41	
23					0.0224										6.40	
24					0.0207										6.36	
25					0.0243										6.34	
26					0.0328										6.42	
27					0.0231							1334	18		6.47	61.29
28	271.06	55.61	278	57.04	0.0246	7.16	97	1.5	5.34	98	1.1	2	8		6.40	12.13
29					0.0334										6.26	
30					0.0413										6.49	
31					0.0616										6.32	
Total	1073.33	217.922	961	194.936	0.8884	39.02	385.208	7.968	34.51	384.75	7.04	2670	52		196.9	
	AVG 268.33	AVG 54.48	AVG 240.25	AVG 48.73	AVG 0.029	AVG 9.76	AVG 96.36	AVG 1.99	AVG 8.63	AVG 96.41	AVG 1.76	GEM 26	AVG 8.67		MIN 6.05	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**			**6**	
	MAX 305.50	MAX 58.60	MAX 285.00	MAX 57.04	MAX 0.062	AVW 11.57		AVW 2.38	AVW 10.45		AVG 2.22	GM 97	AVG		MAX 6.49	
Limits						**45**		**30**	**45**		**39**	**400**			**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM7=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations **Mail to P.O. Box 47775, Olympia WA 98504-7775**

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	1334	13	1334	
Day 4 (CFU/100 mL)		7		2	
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	3.12515583	1.11394335	3.12515583	
Day 4 (log)		0.84509804		0.30103	
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	1.98512693	1.11394335	1.71309291	#DIV/0!

Week Avg:		**97**	**13**	**52**	**#DIV/0!**

Month Avg (log) 1.41839717

Month Avg:	**26**
HIGHEST WEEKLY	**97**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024431 | Month November | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0616									6.21	
2					0.0484									6.27	
3					0.0364							<1	4.5	6.17	22.86
4	217.36	54.75	219	55.16	0.0302	8.27	96	2.1	9.13	96	2.3			6.37	
5					0.0322									6.18	
6					0.0405									6.43	
7					0.0378									6.26	
8					0.0548									6.24	
9					0.0505									6.38	
10					0.0375							E18	9	6.38	39.60
11	152.25	47.74	162.5	50.96	0.0376	9.71	94	3.0	8.11	95	2.5			6.35	
12					0.0469									6.22	
13					0.0917									6.07	
14					0.0752									6.19	
15					0.0621									6.30	
16					0.061									6.38	
17					0.065							147	8.5	6.26	74.88
18	12.06	10.86	12	10.81	0.108	6.64	45	6.0	7.22	40	6.5			6.14	
19					0.0663									6.19	
20					0.0648									6.19	
21					0.0491									6.37	
22					0.0444									6.36	
23					0.0448									6.29	
24					0.0422							183	7	6.32	70.15
25	165.78	52.54	132	41.83	0.038	7.34	96	2.3	6.19	95	2.0			6.35	
26					0.0347									6.11	
27					0.0394									6.48	
28					0.0283									6.03	
29					0.0294									6.03	
30					0.0299									6.32	
31															
Total	547.45	165.891	525.5	158.759	1.4887	31.96	330.332	13.43	30.65	325.98	13.31	330	29	187.8	
	AVG 136.86	AVG 41.47	AVG 131.38	AVG 39.69	AVG 0.050	AVG 7.99	AVG 94.16	AVG 3.36	AVG 7.66	AVI 94.17	AVG 3.33	GEM 26	AVG 7.25	MIN 6.03	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 217.36	MAX 54.75	MAX 219.00	MAX 55.16	MAX 0.108	AVG 9.71		AVW 5.98	AVW 9.13		AVI 6.50	GMT 183	AVW	MAX 6.48	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GM7=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	18	147	183	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	1.25527251	2.16731733	2.26245109	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	1.25527251	2.16731733	2.26245109	#DIV/0!

Week Avg:		**18**	**147**	**183**	**#DIV/0!**

Month Avg (log) 1.42126023

Month Avg:	**26**
HIGHEST WEEKLY	**183**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month December | Year 2015

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T) RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous	
1					0.0217							<1	8	6.29	22.17	
2	186.63	54.32	183.34	53.36	0.0349	10.19	95	3.0	10.13	94	2.9			6.22		
3					0.0606									6.40		
4					0.0683									6.16		
5					0.0538									6.11		
6					0.0653									6.22		
7					0.1083									6.07		
8					0.0632							E10	6.5	6.11	54.37	
9	66.87	71.27	87.5	93.26	0.1278	11.48	83	12.2	12.61	86	13.4			6.08		
10					0.088									6.32		
11					0.0922									6.01		
12					0.0731									6.20		
13					0.0881									6.18		
14					0.0791									6.25		
15					0.0544							E32	16.5	6.13	33.32	
16	112.25	47.46	88.67	37.49	0.0507	10.77	90	4.6	12.43	86	5.3			6.30		
17					0.0459									6.17		
18					0.0583									6.02		
19					0.0625									6.28		
20					0.0644									6.08		
21					0.066									6.16		
22					0.0599							E215	6	6.17	82.87	
23	109.81	55.59	132	66.823	0.0607	6.93	94	3.5	8.56	94	4.3			6.26		
24					0.0698									6.12		
25					0.0597									6.27		
26					0.0525									6.19		
27					0.0444									6.09		
28					0.0604									6.28		
29					0.0464							E42	9.5	6.12	51.38	
30	134.18	45.66	115.5	39.30	0.0408	8.49	94	2.9	8.71	92	3.0			6.31		
31					0.039									6.11		
Total	609.74	274.306	607.01	290.24	1.9602	47.86	455.139	26.153	52.44	452.02	28.942	0	46.5	191.7		
	AVG 121.95	AVG 54.86	AVG 121.40	AVG 58.05	AVG 0.063	AVG 9.57	AVG 92.15	AVG 5.23	AVG 10.49	AVG 91.36	AVG 5.79	GEM 20	AVG 9.30	MIN 6.01		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**		
	MAX 134.18	MAX 71.27	MAX 132.00	MAX 93.26	MAX 0.128	AVW 11.48		AVW 12.24	AVW 12.61		AVW 13.44	GMT 215	AVW	MAX 6.40		
Limits						**45**		**30**	**45**		**39**	**400**		**9**		

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	10	32	215	42
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

42

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	1	1.50514998	2.33243846	1.62324929
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	1	1.50514998	2.33243846	1.62324929
Week Avg:		**10**	**32**	**215**	**42**

Month Avg (log) 1.29216755

Month Avg:	**20**
HIGHEST WEEKLY	**215**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month January | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0452									6.17	
2					0.0351									5.90	
3					0.0325									6.12	
4					0.0329									6.19	
5					0.0308							<1	6	6.22	18.24
6	175.44	42.87	143.34	35.03	0.0293	12.18	93	3.0	28.53	80	7.0			6.26	
7					0.035									6.31	
8					0.0288									6.12	
9					0.0357									6.55	
10					0.0279									6.04	
11					0.0274									6.34	
12					0.0345							E6	7	6.07	25.93
13	127.06	64.75	123	62.68	0.0611	14.84	88	7.6	18.17	85	9.3			6.21	
14					0.0479									6.11	
15					0.049									6.13	
16					0.0524									6.24	
17					0.071									6.00	
18					0.0694									6.00	
19					0.0556							E18	7.5	6.23	52.84
20	181.5	77.96	120.5	51.76	0.0515	11.41	94	4.9	6.01	95	2.6			6.22	
21					0.076									6.27	
22					0.1446									6.05	
23					0.093									6.06	
24					0.065									6.15	
25					0.0586									6.13	
26					0.054							26	10	6.21	32.84
27	99.3	44.72	97	43.68	0.054	10.64	89	4.8	13.07	87	5.9			6.10	
28					0.1008									6.04	
29					0.0893									6.21	
30					0.0721									6.13	
31					0.0957									6.09	
Total	583.3	230.294	483.84	193.145	1.7561	49.07	364.376	20.23	65.78	346.86	24.7	26	30.5	190.9	
	AVG 145.83	AVG 57.57	AVG 120.96	AVG 48.29	AVG 0.057	AVG 12.27	AVG 91.59	AVG 5.06	AVG 16.45	AVG 86.40	AVG 6.17	GEM 7	AVG 7.63	AVG 5.90	
Permit		135		171	0.12	30	85	20	30	85	26	200		6	
	MAX 181.50	MAX 77.96	MAX 143.34	MAX 62.68	MAX 0.145	AVW 14.84		AVW 7.56	AVW 28.53		AVG 9.26	GMI 26	AVW	MAX 6.55	
Limits						45		30	45		39	400		9	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GM7 =Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	6	18	26	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.77815125	1.25527251	1.41497335	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.77815125	1.25527251	1.41497335	#DIV/0!
Week Avg:		**6**	**18**	**26**	**#DIV/0!**

Month Avg (log) 0.86209928

Month Avg:	**7**
HIGHEST WEEKLY	**26**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month February | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T) RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm	Instantaneous
1					0.0528									6.16		
2					0.0555							E3	5	6.20	11.05	
3	204.52	70.96	225.67	78.29	0.0416	9.68	95	3.4	14.24	94	4.9			6.20		
4					0.0693									6.17		
5					0.0554									6.10		
6					0.0645									6.06		
7					0.0534									6.02		
8					0.0514									6.38		
9					0.0403							58	5.5	6.18	87.29	
10	138.35	46.62	141	47.51	0.0404	7.64	94	2.6	7.1	95	2.4			6.19		
11					0.0414									6.20		
12					0.0659									6.41		
13					0.0587									6.09		
14					0.066									6.14		
15					0.0644									6.11		
16					0.1235							E8	5.5	6.05	52.06	
17	208.26	127.66	234	143.44	0.0735	7.07	97	4.3	7.73	97	4.7			6.18		
18					0.0723									6.27		
19					0.0614									6.03		
20					0.0631									6.25		
21					0.0518									6.23		
22					0.0512									6.28		
23					0.0434							82	7	6.17	52.75	
24	141.73	47.64	131	44.03	0.0403	8.45	94	2.8	13.67	90	4.6			6.16		
25					0.0379									6.18		
26					0.044									6.26		
27					0.0347									6.03		
28					0.0341									6.11		
29					0.045									6.16		
30																
31																
Total	692.86	292.8691	731.67	313.2719	1.5972	32.84	380.388	13.11	42.74	374.92	16.67	140	23	179		
	AVG 173.22	AVG 73.22	AVG 182.92	AVG 78.32	AVG 0.055	AVG 8.21	AVG 95.26	AVG 3.28	AVG 10.69	AVG 94.16	AVG 4.17	GEM 18	AVG 5.75	MIN 6.02		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**		
	MAX 208.26	MAX 127.66	MAX 234.00	MAX 143.44	MAX 0.124	AVW 9.68		AVW 4.33	AVW 14.24		AVG 4.94	GMT 82	AVW	MAX 6.41		
Limits						**45**		**30**	**45**		**39**	**400**		**9**		

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations **Mail to P.O. Box 47775, Olympia WA 98504-7775**

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	3	58	8	82	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.47712125	1.76342799	0.90308999	1.91381385	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.47712125	1.76342799	0.90308999	1.91381385	#DIV/0!
Week Avg:	**3**	**58**	**8**	**82**	**#DIV/0!**

Month Avg (log) 1.26436327

Month Avg:	**18**
HIGHEST WEEKLY	**82**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month March | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous	
1					0.0494							1334	19	6.31	150.21	
2	98.17	91.53	119.5	111.42	0.1118	15.49	84	14.4	19.13	84	17.8	E14	87.69	6.02	5.50	
3					0.088									6.16		
4					0.0699									6.14		
5					0.0821									6.13		
6					0.0707									6.09		
7					0.0719									6.15		
8					0.054							E9	42.87	6.03	8.00	
9	153.22	69.00	160.67	72.36	0.054	7.19	95	3.2	8.43	95	3.8			6.19		
10					0.1301									5.93		
11					0.1328									6.14		
12					0.0756									6.04		
13					0.0693									6.21		
14					0.0829									6.21		
15					0.0726							E6	39.32	6.03	8.50	
16	151	79.09	149.97	78.55	0.0628	6.75	96	3.5	9.1	94	4.8			6.08		
17					0.0595									6.15		
18					0.0415									6.14		
19					0.0424									6.03		
20					0.0403									6.01		
21					0.0538									6.10		
22					0.0334							E4	51.29	6.05	7.50	
23	143.44	48.09	147.67	49.51	0.0402	8.99	94	3.0	13.7	91	4.6			6.18		
24					0.0543									6.19		
25					0.0462									6.20		
26					0.0462									6.11		
27					0.0399									6.01		
28					0.0426									6.29		
29					0.0399							E4	15.32	6.26	7.00	
30	170.88	46.03	179	48.22	0.0323	3.4	98	0.9	8.44	95	2.3			6.09		
31					0.034									6.35		
Total	716.71	333.748	756.81	360.058	1.9244	41.82	466.801	25.1464	58.8	458.68	33.2665	1334	255.49	190		
	AVG 143.34	AVG 66.75	AVG 151.36	AVG 72.01	AVG 0.062	AVG 8.36	AVG 94.17	AVG 5.03	AVG 11.76	AVG 92.23	AVG 6.65	GEM 16	AVG 42.58	MIN 5.93		
Permit		135		171	0.12	30	85	20	30	85	26	200		6		
	MAX 170.88	MAX 79.09	MAX 179.00	MAX 111.42	MAX 0.133	AVW 15.49		AVW 14.44	AVW 19.13		AVW 17.84	GMP 137	AVG	MAX 6.35		
Limits						45		30	45		39	400		9		

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMP=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1334	9	6	4	4
Day 4 (CFU/100 mL)	14				
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

4

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	3.12515583	0.95424251	0.77815125	0.60205999	0.60205999
Day 4 (log)	1.14612804				
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	2.13564193	0.95424251	0.77815125	0.60205999	0.60205999
Week Avg:	**137**	**9**	**6**	**4**	**4**

Month Avg (log) 1.2012996

Month Avg:	**16**
HIGHEST WEEKLY	**137**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month April | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm instantaneous	
1					0.0363									6.36		
2					0.0341									6.32		
3					0.0269									6.00		
4					0.0312									6.13		
5					0.0249							E5	6.5	6.07	28.62	
6	214.12	46.07	169.5	36.47	0.0258	6.14	97	1.3	9.17	95	2.0			6.07		
7					0.0251									6.09		
8					0.0279									6.31		
9					0.0248									6.04		
10					0.0242									6.18		
11					0.0251									6.01		
12					0.0221							E3	6	6.25	28.15	
13	309.67	65.60	291.67	61.79	0.0254	6.86	98	1.5	7.94	97	1.7			6.07		
14					0.0313									7.23		
15					0.0218									6.17		
16					0.022									6.55		
17					0.0227									7.49		
18					0.026									6.03		
19					0.0216							<1	7.5	6.72	24.94	
20	185.75	33.00	164.5	29.22	0.0213	9.08	95	1.6	9.92	94	1.8			6.56		
21					0.0207									6.05		
22					0.021									7.47		
23					0.0304									6.04		
24					0.0221									6.11		
25					0.022									6.21		
26					0.0216							<1	7.5	6.24	21.83	
27	252.81	39.43	198	30.88	0.0187	7.36	97	1.1	7.06	96	1.1			6.16		
28					0.0174									6.03		
29					0.0351									6.33		
30					0.0271									6.15		
31																
Total	962.35	184.097	823.67	158.36	0.7566	29.44	387.118	5.535	34.09	382.27	6.518	0	27.5	189.4		
	AVG 240.59	AVG 46.02	AVG 205.92	AVG 39.59	AVG 0.025	AVG 7.36	AVG 96.94	AVG 1.38	AVG 8.52	AVI 95.86	AVE 1.63	GEM 2	AVG 6.88	MIN 6.00		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**		
	MAX 309.67	MAX 65.60	MAX 291.67	MAX 61.79	MAX 0.035	AVG 9.08		AVG 1.61	AVG 9.92		AVI 1.97	GMF 5	AVG	MAX 7.49		
Limits						**45**		**30**	**45**		**39**	**400**		**9**		

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	5	3	1	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.69897	0.47712125	0	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.69897	0.47712125	0	0	#DIV/0!
Week Avg:	**5**	**3**	**1**	**1**	**#DIV/0!**

Month Avg (log) 0.29402281

Month Avg:	**2**
HIGHEST WEEKLY	**5**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month May | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT					EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal		pH STANDARD UNITS	Flow gpm	Instantaneous
1					0.0236										6.08		
2					0.0214										6.26		
3					0.0206							E2	7.5		6.11	11.17	
4	296	50.61	263.67	45.08	0.0205	7.77	97	1.3	8.56	97	1.5				6.14		
5					0.0198										6.38		
6					0.0229										6.39		
7					0.0226										6.27		
8					0.0176										6.43		
9					0.019										6.09		
10					0.0179							E13	7.5		6.01	19.21	
11	296.52	39.32	243.67	32.31	0.0159	9.63	97	1.3	7.39	97	1.0				6.26		
12					0.0202										6.27		
13					0.0275										6.33		
14					0.0204										6.19		
15					0.0205										6.17		
16					0.0209										6.49		
17					0.018							E4	6		6.25	18.68	
18	261.83	37.78	224.67	32.42	0.0173	13.04	95	1.9	9.33	96	1.3				6.14		
19					0.0185										6.16		
20					0.0263										6.32		
21					0.019										6.11		
22					0.017										6.23		
23					0.0226										6.23		
24					0.0211							1334	13.5		6.09	53.80	
25	262.7	45.57	214	37.12	0.0208	9.57	96	1.7	8.44	96	1.5	E4	5		6.22	14.70	
26					0.0211										6.30		
27					0.0308										6.19		
28					0.0247										6.18		
29					0.0304										6.35		
30					0.0244										6.26		
31					0.0244							<1	4.5		6.14	20.18	
Total	1117.05	173.276	946.01	146.93	0.6677	40.01	385.504	6.147	33.72	385.62	5.254	1334	44		193		
	AVG 279.26	AVG 43.32	AVG 236.50	AVG 36.73	AVG 0.022	AVG 10.00	AVG 96.42	AVG 1.54	AVG 8.43	AVG 96.44	AVG 1.31	GEM 9	AVG 7.33		MIN 6.01		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**			**6**		
	MAX 296.52	MAX 50.61	MAX 263.67	MAX 45.08	MAX 0.031	AVG 13.04		AVG 1.88	AVG 9.33		AVG 1.46	GMF 73	AVG		MAX 6.49		
Limits						**45**		**30**	**45**		**39**	**400**			**9**		

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMF=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	2	13	4	1334	1
Day 4 (CFU/100 mL)				4	
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					1
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.30103	1.11394335	0.60205999	3.12515583	0
Day 4 (log)				0.60205999	
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.30103	1.11394335	0.60205999	1.86360791	0
Week Avg:	**2**	**13**	**4**	**73**	**1**

Month Avg (log) 0.95737486

Month Avg:	**9**
HIGHEST WEEKLY	**73**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024431 | Month June | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1	231.83	40.41	225	39.22	0.0209	9.63	96	1.7	5.31	98	0.9			6.39	
2					0.0184									6.29	
3					0.0189									6.28	
4					0.0216									6.38	
5					0.0227									6.47	
6					0.02									6.37	
7					0.0186							E474	10	6.30	35.01
8	288.65	53.92	258.67	48.32	0.0224	14.19	95	2.7	12.89	95	2.4	E17	4	6.24	15.48
9					0.0212									6.27	
10					0.028									6.39	
11					0.022									6.30	
12					0.0211									6.17	
13					0.0252									6.18	
14					0.0203							1334	5.5	6.31	72.26
15	271.83	44.43	221.34	36.18	0.0196	12.19	96	2.0	15.33	93	2.5	E24	8.5	6.27	18.32
16					0.0221									6.24	
17					0.0284									6.47	
18					0.0176									6.49	
19					0.0266									6.38	
20					0.0205									6.42	
21					0.02							2	2.5	6.44	4.24
22	251.4	41.93	224	37.36	0.02	11.07	96	1.8	7.7	97	1.3			6.45	
23					0.0313									6.54	
24					0.0209									6.26	
25					0.0237									6.30	
26					0.0256									6.23	
27					0.0208									6.30	
28					0.0184							40	4	6.24	15.57
29	235.55	40.66	200.34	34.59	0.0207	2.32	99	0.4	9.16	95	1.6			6.25	
30					0.0227									6.49	
31															
Total	1279.26	221.367	1129.35	195.67	0.6602	49.4	481.057	8.569	50.39	477.7	8.705	1376	34.5	190.1	
	AVG 255.85	AVG 44.27	AVG 225.87	AVG 39.13	AVG 0.022	AVG 9.88	AVG 96.14	AVG 1.71	AVG 10.08	AVW 95.54	AVG 1.74	GEM 52	AVG 5.75	MIN 6.17	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 288.65	MAX 53.92	MAX 258.67	MAX 48.32	MAX 0.031	AVW 14.19		AVW 2.65	AVW 15.33		AVW 2.51	GMT 179	AVW	MAX 6.54	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	474	1334	2	40	
Day 4 (CFU/100 mL)	17	24			
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	2.67577834	3.12515583	0.30103	1.60205999	
Day 4 (log)	1.23044892	1.38021124			
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.95311363	2.25268354	0.30103	1.60205999	#DIV/0!
Week Avg:	**90**	**179**	**2**	**40**	**#DIV/0!**

Month Avg (log)	1.71911405
Month Avg:	**52**
HIGHEST WEEKLY	**179**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month July | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT					EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous	
1					0.0206									6.43		
2					0.0214									6.37		
3					0.025									6.34		
4					0.0299									6.40		
5					0.0236							113	8	6.38	36.35	
6	305.03	58.00	318	60.47	0.0228	11.82	96	2.2	10	97	1.9			6.45		
7					0.0211									6.43		
8					0.0261									6.39		
9					0.0302									6.48		
10					0.0277									6.39		
11					0.0241									6.40		
12					0.0236							240	7.5	6.31	53.08	
13	284.3	59.28	258	53.79	0.025	11.63	96	2.4	9.78	96	2.0			6.39		
14					0.026									6.40		
15					0.0234									6.41		
16					0.0334									6.41		
17					0.023									6.31		
18					0.0286									6.54		
19					0.0221							E12	15	6.47	21.43	
20	249.35	45.75	211.67	38.84	0.022	14	94	2.6	10.22	95	1.9			6.45		
21					0.0212									6.53		
22					0.0306									6.48		
23					0.0222									6.36		
24					0.0218									6.48		
25					0.0221									6.56		
26					0.0202							574	14	6.44	32.61	
27	245.32	44.81	203.34	37.14	0.0219	12.7	95	2.3	12.67	94	2.3	132	12.5	6.41	23.64	
28					0.0225									6.41		
29					0.0299									6.44		
30					0.0232									6.34		
31					0.0234									6.47		
Total	1084	207.836	991.01	190.24	0.7586	50.15	381.243	9.561	42.67	382	8.13	1059	57	199.1		
	AVG 271.00	AVG 51.96	AVG 247.75	AVG 47.56	AVG 0.024	AVG 12.54	AVG 95.37	AVG 2.39	AVG 10.67	AVI 95.69	AVG 2.03	GEM 120	AVG 11.40	MIN 6.31		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**		
	MAX 305.03	MAX 59.28	MAX 318.00	MAX 60.47	MAX 0.033	AVG 14		AVG 2.57	AVG 12.67		AVG 2.31	GMT 275	AVG	MAX 6.56		
Limits						**45**		**30**	**45**		**39**	**400**		**9**		

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	113	240	12	574	
Day 4 (CFU/100 mL)				132	
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	2.05307844	2.38021124	1.07918125	2.75891189	
Day 4 (log)				2.12057393	
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	2.05307844	2.38021124	1.07918125	2.43974291	#DIV/0!
Week Avg:	**113**	**240**	**12**	**275**	**#DIV/0!**

Month Avg (log) 2.07839135

Month Avg:	**120**
HIGHEST WEEKLY	**275**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month August | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0263									6.47	
2					0.0205							E15	6.5	6.40	11.77
3	372.6	64.64	377	65.40	0.0208	13.31	96	2.3	12.78	97	2.2			6.37	
4					0.0214									6.37	
5					0.0193									6.36	
6					0.0284									6.33	
7					0.0238									6.28	
8					0.0267									6.36	
9					0.0208							114	6.5	6.28	20.06
10	276.07	49.04	243	43.17	0.0213	12.28	96	2.2	12.11	95	2.2			6.43	
11					0.0278									6.39	
12					0.0215									6.33	
13					0.0202									6.33	
14					0.0208									6.28	
15					0.0286									6.53	
16					0.0214							E5	7	6.32	16.45
17	284.7	48.91	278.34	47.82	0.0206	11.55	96	2.0	10	96	1.7			6.33	
18					0.0233									6.32	
19					0.026									6.36	
20					0.0247									6.28	
21					0.022									6.43	
22					0.0227									6.27	
23					0.02							E3	3.5	6.30	29.91
24	252.62	42.98	210	35.73	0.0204	11.75	95	2.0	8.72	96	1.5			6.30	
25					0.0321									6.27	
26					0.023									6.22	
27					0.0215									6.37	
28					0.022									6.26	
29					0.0263									6.44	
30					0.0199							E3	5.5	6.28	21.17
31	299.95	49.78	260.67	43.26	0.0199	11.2	96	1.9	9.5	96	1.6			6.45	
Total	1485.94	255.351	1369.01	235.38	0.714	60.09	479.538	10.33	53.11	480.24	9.147	114	29	196.7	
	AVG 297.19	AVG 51.07	AVG 273.80	AVG 47.08	AVG 0.023	AVG 12.02	AVG 95.96	AVG 2.07	AVG 10.62	AVI 96.12	AVG 1.83	GEM 9	AVG 5.80	MIN 6.22	
Permit		135		171	0.12	30	85	20	30	85	26	200		6	
	MAX 372.60	MAX 64.64	MAX 377.00	MAX 65.40	MAX 0.032	AVW 13.31		AVW 2.31	AVW 12.78		AVI 2.22	GMF 114	AVG	MAX 6.53	
Limits						45		30	45		39	400		9	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMF=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	15	114	5	3	3
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					3
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.17609126	2.05690485	0.69897	0.47712125	0.47712125
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.17609126	2.05690485	0.69897	0.47712125	0.47712125
Week Avg:	**15**	**114**	**5**	**3**	**3**

Month Avg (log) 0.97724172

Month Avg:	**9**
HIGHEST WEEKLY	**114**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month September | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0202									6.37	
2					0.0291									6.27	
3					0.0409									6.50	
4					0.0231									6.37	
5					0.0219									6.27	
6					0.0246							314	12	6.29	27.18
7	206.12	37.13	176.67	31.83	0.0216	11.04	95	2.0	10.06	94	1.8	E3	5	6.31	8.31
8					0.0224									6.25	
9					0.0269									6.35	
10					0.026									6.39	
11					0.0208									6.25	
12					0.02									6.27	
13					0.0181							E9	8	6.36	20.05
14	294.22	52.27	248.34	44.12	0.0213	11.21	96	2.0	10.72	96	1.9			6.32	
15					0.0288									6.40	
16					0.0201									6.29	
17					0.0206									6.27	
18					0.0258									6.12	
19					0.0274									6.46	
20					0.0228							E17	10	6.27	52.91
21	233.21	45.32	211.34	41.07	0.0233	10.86	95	2.1	10.78	95	2.1			6.30	
22					0.0225									6.28	
23					0.0236									6.24	
24					0.0302									6.27	
25					0.0226									6.12	
26					0.0229									6.30	
27					0.0226							E42	8	6.20	47.15
28	264.61	40.83	195.34	30.14	0.0185	10.94	96	1.7	7.58	96	1.2			6.47	
29					0.0238									6.31	
30					0.0287									6.30	
31															
Total	998.16	175.542	831.69	147.15	0.7211	44.05	382.043	7.778	39.14	381	6.981	314	43	189.2	
	AVG 249.54	AVG 43.89	AVG 207.92	AVG 36.79	AVG 0.024	AVG 11.01	AVG 95.59	AVG 1.94	AVG 9.79	AVW 95.29	AVE 1.75	GEM 23	AVG 8.60	MIN 6.12	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 294.22	MAX 52.27	MAX 248.34	MAX 44.12	MAX 0.041	AVW 11.21		AVW 2.11	AVW 10.78		AVE 2.09	GM 42	AVG	MAX 6.50	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM7 =highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	314	9	17	42	
Day 4 (CFU/100 mL)	3				
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	2.49692965	0.95424251	1.23044892	1.62324929	
Day 4 (log)	0.47712125				
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.48702545	0.95424251	1.23044892	1.62324929	#DIV/0!

Week Avg:	**31**	**9**	**17**	**42**	**#DIV/0!**

Month Avg (log) 1.35639832

Month Avg:	**23**
HIGHEST WEEKLY	**42**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month October | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.028									6.23	
2					0.0186									6.37	
3					0.0255									6.26	
4					0.0235							E3	7.5	6.22	2.15
5	273.1	55.80	222.67	45.50	0.0245	12.61	95	2.6	12.06	95	2.5			6.26	
6					0.035									6.23	
7					0.0336									6.29	
8					0.033									6.15	
9					0.0695									6.20	
10					0.0349									6.42	
11					0.0271							E594	12.5	6.15	40.60
12	186.43	36.38	168	32.79	0.0234	15.64	92	3.1	11.45	93	2.2	E34	11.5	6.18	15.50
13					0.0449									6.46	
14					0.092									6.08	
15					0.1282									6.04	
16					0.0865									6.16	
17					0.0792									6.23	
18					0.0616							E3	5	6.27	18.64
19	151.2	67.97	126	56.64	0.0539	10.2	93	4.6	11.28	91	5.1			6.16	
20					0.0706									6.27	
21					0.065									6.11	
22					0.067									6.05	
23					0.0534									6.23	
24					0.0516									6.33	
25					0.047							E15	7.5	6.27	55.65
26	165.63	70.03	114	48.20	0.0507	10.67	94	4.5	9.67	92	4.1			6.16	
27					0.072									6.31	
28					0.0818									6.15	
29					0.0578									6.28	
30					0.0509									6.19	
31					0.0648									6.28	
Total	776.36	230.188	630.67	183.13	1.6555	49.12	373.805	14.73	44.46	370.3	13.86	0	44	193	
	AVG 194.09	AVG 57.55	AVG 157.67	AVG 45.78	AVG 0.053	AVG 12.28	AVG 93.67	AVG 3.68	AVG 11.12	AVW 92.95	AVG 3.46	GEM 19	AVG 8.80	MIN 6.04	
Permit		135		171	0.12	30	85	20	30	85	26	200		6	
	MAX 273.10	MAX 70.03	MAX 222.67	MAX 56.64	MAX 0.128	AVW 15.64		AVW 4.59	AVW 12.06		AVW 5.07	GMM 142	AVW	MAX 6.46	
Limits						45		30	45		39	400		9	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMM=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	3	594	3	15	
Day 4 (CFU/100 mL)		34			
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.47712125	2.77378644	0.47712125	1.17609126	
Day 4 (log)		1.53147892			
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.47712125	2.15263268	0.47712125	1.17609126	#DIV/0!
Week Avg:	**3**	**142**	**3**	**15**	**#DIV/0!**

Month Avg (log) 1.28711983

Month Avg:	**19**
HIGHEST WEEKLY	**142**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

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WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month November | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous	
1					0.0378							E62	8	6.41	64.82	
2	179.38	87.82	237	116.03	0.0587	10.45	94	5.1	10.41	96	5.1			6.27		
3					0.0848									6.04		
4					0.0592									6.17		
5					0.0693									6.15		
6					0.0686									6.07		
7					0.1159									6.25		
8					0.0491							280	5.5	6.20	71.22	
9	109.67	46.92	89	38.08	0.0513	9.49	91	4.1	9.49	89	4.1			6.16		
10					0.0621									6.17		
11					0.0425									6.03		
12					0.0477									6.11		
13					0.0508									6.15		
14					0.0572									6.25		
15					0.0485							125	7.5	6.30	38.96	
16	155.76	56.12	147.67	53.20	0.0432	9.42	94	3.4	8.9	94	3.2			6.12		
17					0.0452									6.22		
18					0.0402									6.27		
19					0.0395									6.22		
20					0.0451									6.21		
21					0.058									6.24		
22					0.0432							128	5	6.07	30.90	
23	136.36	69.37	137.5	69.95	0.061	6.72	95	3.4	5.78	96	2.9			6.16		
24					0.066									6.03		
25					0.102									6.04		
26					0.1265									5.77		
27					0.0905									6.08		
28					0.0697									6.02		
29					0.0555							E13	8	6.19	18.79	
30	160.52	67.74	151.5	63.93	0.0506	10.62	93	4.5	10.4	93	4.4			6.10		
31														6.05		
Total	741.69	327.969	762.67	341.1923	1.8397	46.7	467.929	20.47	44.98	467.85	19.69	533	34	190.5		
	AVG 148.34	AVG 65.59	AVG 152.53	AVG 68.24	AVG 0.061	AVG 9.34	AVG 93.70	AVG 4.09	AVG 9.00	AVW 94.10	AVG 3.94	GEM 82	AVG 6.80	MIN 5.77		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**		
	MAX 160.52	MAX 69.37	MAX 151.50	MAX 116.03	MAX 0.127	AVG 10.62		AVG 5.12	AVG 10.41		AVW 5.10	GMT 280	AVG	MAX 6.30		
Limits						**45**		**30**	**45**		**39**	**400**		**9**		

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	62	280	125	128	13
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					13
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.79239169	2.44715803	2.09691001	2.10720997	1.11394335
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.79239169	2.44715803	2.09691001	2.10720997	1.11394335
Week Avg:	**62**	**280**	**125**	**128**	**13**

Month Avg (log) 1.91152261

Month Avg:	**82**
HIGHEST WEEKLY	**280**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month December | Year 2016

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	PH STANDARD UNITS	Flow gpm Instantaneous
1					0.0597									6.17	
2					0.0493									6.07	
3					0.0505									6.11	
4					0.055									6.08	
5					0.0541									6.24	
6					0.0474							<1	7.5	6.18	14.10
7	122.69	42.77	105.5	36.78	0.0418	10.52	91	3.7	9.5	91	3.3			6.05	
8					0.0389									6.23	
9					0.0429									6.48	
10					0.0462									6.00	
11					0.0647									6.01	
12					0.0669									6.14	
13					0.0581							E7	14.81	6.16	11.50
14	135.17	53.77	114.5	45.55	0.0477	11.27	92	4.5	10.33	91	4.1			6.17	
15					0.0512									6.30	
16					0.0401									6.19	
17					0.0364									6.05	
18					0.0341									6.14	
19					0.0522									6.30	
20					0.0619							727	62.46	6.04	11.00
21	127.1	52.36	114.5	47.17	0.0494	11.3	91	4.7	10.43	91	4.3	E2	7.67	6.01	10.00
22					0.0441									6.23	
23					0.04									6.30	
24					0.0476									6.15	
25					0.0365									6.33	
26					0.0319									6.19	
27					0.0468							E66	65.31	6.23	11.50
28	164.92	66.02	169	67.65	0.048	13.57	92	5.4	14.37	91	5.8			6.13	
29					0.0467									6.01	
30					0.0599									6.05	
31					0.0427									6.09	
Total	549.88	214.93	503.5	197.16	1.4927	46.66	365.969	18.24	44.63	364.4	17.47	727	157.75	190.8	
	AVG 137.47	AVG 53.73	AVG 125.88	AVG 49.29	AVG 0.048	AVG 11.67	AVG 91.51	AVG 4.56	AVG 11.16	AVE 91.14	AVG 4.37	GEM 15	AVG 31.55	MIN 6.00	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 164.92	MAX 66.02	MAX 169.00	MAX 67.65	MAX 0.067	AVG 13.57		AVG 5.43	AVG 14.37		AVG 5.75	GM 66	AVG	MAX 6.48	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GM7=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	7	727	66	
Day 4 (CFU/100 mL)			2		
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.84509804	2.86153441	1.81954394	
Day 4 (log)			0.30103		
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.84509804	1.5812822	1.81954394	#DIV/0!

Week Avg:		**7**	**38**	**66**	**#DIV/0!**

Month Avg (log) 1.16544128

Month Avg:	**15**
HIGHEST WEEKLY	**66**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month January | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.045									6.17	
2					0.0389									6.41	
3					0.0332							3	7.5	6.42	16.43
4	167.2	41.14	146.34	36.00	0.0295	12.51	93	3.1	10.13	93	2.5			6.30	
5					0.0329									6.16	
6					0.028									6.25	
7					0.0341									6.23	
8					0.034									6.36	
9					0.0339									6.29	
10					0.0352							287	10.5	6.07	32.67
11	181.67	42.88	153.5	36.23	0.0283	12.5	93	3.0	11.28	93	2.7			6.18	
12					0.0266									6.15	
13					0.0346									6.15	
14					0.0279									6.14	
15					0.0249									6.18	
16					0.0217									6.22	
17					0.0258							E20	10.5	6.13	41.25
18	180.28	90.81	184.67	93.02	0.0604	17	91	8.6	22.53	88	11.3			6.25	
19					0.0742									6.04	
20					0.0648									6.17	
21					0.0235									6.24	
22					0.0558									6.14	
23					0.0384									6.03	
24					0.0336							E202	7.5	6.07	49.40
25	186.77	50.16	162	43.50	0.0322	11.08	94	3.0	14.18	91	3.8			6.05	
26					0.031									5.90	
27					0.0337									6.19	
28					0.0275									6.21	
29					0.0262									6.15	
30					0.031									6.22	
31					0.026							E2	5.5	6.10	9.60
Total	715.92	224.985	646.51	208.76	1.0928	53.09	370.275	17.57	58.12	364.8	20.312	290	41.5	191.6	
	AVG 178.98	AVG 56.25	AVG 161.63	AVG 52.19	AVG 0.035	AVG 13.27	AVG 92.58	AVG 4.39	AVG 14.53	AVG 91.01	AVG 5.08	GEM 23	AVG 8.30	MIN 5.90	
Permit		135		171	0.12	30	85	20	30	85	26	200		6	
	MAX 186.77	MAX 90.81	MAX 184.67	MAX 93.02	MAX 0.074	AVW 17		AVW 8.56	AVW 22.53		AVW 11.35	GMT 287	AVW	MAX 6.42	
Limits						45		30	45		39	400		9	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	3	287	20	202	2
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					2
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.47712125	2.4578819	1.30103	2.30535137	0.30103
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.47712125	2.4578819	1.30103	2.30535137	0.30103
Week Avg:	**3**	**287**	**20**	**202**	**2**

Month Avg (log) 1.3684829

Month Avg:	**23**
HIGHEST WEEKLY	**287**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024431 | Month February | Year 2017

Facility Name Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Type RBC | Population 300

	INFLUENT				EFFLUENT										
Frequency	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK			5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1	279.49	59.67	223	47.61	0.0256	10.23	96	2.2	9.83	96	2.1			6.23	
2					0.0264									6.08	
3					0.0254									6.02	
4					0.0407									6.17	
5					0.0474									6.29	
6					0.0431									6.18	
7					0.0407							E38	7	6.01	22.90
8	156.82	47.74	136	41.4	0.0365	10.24	93	3.1	8.43	94	2.6			6.08	
9					0.0714									6.22	
10					0.1261									6.04	
11					0.0747									5.93	
12					0.062									6.05	
13					0.0562									6.14	
14					0.0447							E23	5	6.16	12.43
15	164.08	73.90	150.5	67.78	0.054	9.86	94	4.4	6.61	96	3.0			6.09	
16					0.0806									6.01	
17					0.0662									6.00	
18					0.0615									6.04	
19					0.0455									6.12	
20					0.0456									6.05	
21					0.0424							<1	5	6.08	19.83
22	157.8	46.33	126	36.99	0.0352	8.4	95	2.5	8.66	93	2.5			6.15	
23					0.035									6.09	
24					0.0404									6.05	
25					0.0297									6.27	
26					0.0285									6.16	
27					0.0304									6.13	
28					0.027							E4	8.5	6.20	17.02
29														6.03	
30															
31															
Total	758.19	227.63	635.5	193.78	1.3429	38.73	378.478	12.21	33.53	378.1	10.18	0	25.5	177.1	
	AVG 189.55	AVG 56.91	AVG 158.88	AVG 48.44	AVG 0.048	AVG 9.68	AVG 94.89	AVG 3.05	AVG 8.38	AVI 94.72	AVG 2.55	GEM 8	AVG 6.38	MIN 5.93	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 164.08	MAX 73.90	MAX 150.50	MAX 67.78	MAX 0.126	AVW 10.24		AVW 4.44	AVW 9.83		AVW 2.98	GMI 38	AVW	MAX 6.29	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMI=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	38	23	1	4	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.5797836	1.36172784	0	0.60205999	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.5797836	1.36172784	0	0.60205999	#DIV/0!

Week Avg:	**38**	**23**	**1**	**4**	**#DIV/0!**

Month Avg (log) 0.88589286

Month Avg:	**8**
HIGHEST WEEKLY	**38**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

Clallam Bay-Sekiu P.O.T.W.
Permit No. WA0024449

P.O.Box 243
Clallam Bay, Wa 98326

March 10, 2017

Department of Ecology
P.O. Box 47775
Olympia, Wa 98504-7775

Dear Sir or Madam:

On 2/11/17 there was a low pH (5.93) at the Clallam Bay Wastewater Treatment Plant. Hydrated lime was added to correct the ph. A new test was done and a pH of 6.05 was recorded.

Please feel free to contact me if you have further questions at 360-963-2397

Sincerely,

Kim Malakoff
Senior Wastewater Treatment Plant Operator

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024431 | Month MARCH | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK			5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal		pH STANDARD UNITS	Flow gpm Instantaneous
1	175.29	41.52	137.5	32.57	0.0284	9.75	94	2.3	10.82	92	2.6				6.02	
2					0.0388										6.49	
3					0.0408										6.02	
4					0.0597										5.96	
5					0.0466										6.10	
6					0.0507										6.55	
7					0.0279							<1	6.5		6.15	5.31
8	174.38	66.46	152	57.93	0.0457	12.64	93	4.8	13.76	91	5.2				6.01	
9					0.0525										6.08	
10					0.0565										5.94	
11					0.0506										5.92	
12					0.0531										6.08	
13					0.0554										6.41	
14					0.053							<1	8		6.05	14.90
15	126.68	59.80	123.5	58.30	0.0566	8.1	94	3.8	10	92	4.7				6.05	
16					0.0508										6.00	
17					0.058										6.19	
18					0.0683										5.96	
19					0.0582										6.13	
20					0.0469										6.27	
21					0.0403							E22	7		6.18	16.93
22	208.95	82.78	189	74.87	0.0475	10.76	95	4.3	11.06	94	4.4				6.00	
23					0.0519										6.37	
24					0.0598										6.23	
25					0.0546										6.14	
26					0.0464										6.18	
27					0.0497										6.44	
28					0.0495							40	8		6.35	40.54
29	118.38	84.71	92.84	66.43	0.0858	11.11	91	8.0	14	85	10.0				6.13	
30					0.1018										6.29	
31					0.0583										6.10	
Total	803.68	335.265	694.84	290.1	1.6441	52.36	466.261	23.16	59.64	454	26.927	40	29.5		190.8	
	AVG 160.74	AVG 67.05	AVG 138.97	AVG 58.02	AVG 0.053	AVG 10.47	AVG 93.48	AVG 4.63	AVG 11.93	AVI 91.42	AVE 5.39	GEM 5	AVG 7.38		MIN 5.92	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**			**6**	
	MAX 208.95	MAX 84.71	MAX 189.00	MAX 74.87	MAX 0.102	AVG 12.64		AVG 7.95	AVG 14.00		AVI 10.02	GMF 40	AVW		MAX 6.55	
Limits						**45**		**30**	**45**		**39**	**400**			**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	1	22	40	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0	1.34242268	1.60205999	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0	1.34242268	1.60205999	#DIV/0!
Week Avg:		1	22	40	#DIV/0!

Month Avg (log) 0.73612067

Month Avg:	**5**
HIGHEST WEEKLY	**40**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month April | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.05									6.46	
2					0.0452									6.34	
3					0.0429									6.51	
4					0.0333							E5	5.5	6.24	5.83
5	179.25	64.28	120.5	43.21	0.043	12.71	93	4.6	14.7	88	5.3			6.34	
6					0.0521									6.43	
7					0.045									6.31	
8					0.0746									6.28	
9					0.0598									6.43	
10					0.0549									6.41	
11					0.0514							E9	7	6.27	67.94
12	161.57	59.96	131.5	48.80	0.0445	9.63	94	3.6	12.06	91	4.5			6.28	
13					0.0566									6.15	
14					0.0497									6.21	
15					0.0419									6.09	
16					0.041									6.28	
17					0.0349									6.35	
18					0.0344							74	7	6.28	60.93
19	200.19	56.60	170.34	48.16	0.0339	11.91	94	3.4	13.39	92	3.8			6.48	
20					0.0338									6.29	
21					0.0408									6.04	
22					0.0376									6.33	
23					0.0344									6.29	
24					0.04									6.31	
25					0.0309							E12	8	6.40	28.51
26	193.12	54.76	234	66.35	0.034	8.91	95	2.5	9.72	96	2.8			6.39	
27					0.0329									6.14	
28					0.0352									6.33	
29					0.0271									6.34	
30					0.031									6.31	
31															
Total	734.13	235.606	656.34	206.53	1.2668	43.16	376.386	14.03	49.87	366.6	16.29	74	27.5	189.3	
	AVE 183.53	AVG 58.90	AVG 164.09	AVG 51.63	AVG 0.042	AVG 10.79	AVG 94.12	AVG 3.51	AVG 12.47	AVW 92.40	AVE 4.07	GEM 14	AVG 6.88	MIN 6.04	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 200.19	MAX 64.28	MAX 234.00	MAX 66.35	MAX 0.075	AVW 12.71		AVW 4.56	AVW 14.70		AVW 5.27	GMT 74	AVW	MAX 6.51	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	5	9	74	12	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.69897	0.95424251	1.86923172	1.07918125	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.69897	0.95424251	1.86923172	1.07918125	#DIV/0!

Week Avg:	5	9	74	12	#DIV/0!

Month Avg (log) 1.15040637

Month Avg:	14
HIGHEST WEEKLY	74

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month May | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

			INFLUENT			EFFLUENT											
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0296									6.43	
2					0.0276							E3	6.5	6.30	11.26
3	205.81	45.66	174	38.601	0.0266	7.34	96	1.6	14.55	92	3.2			6.31	
4					0.0342									6.07	
5					0.025									6.17	
6					0.0295									6.00	
7					0.0249									6.19	
8					0.0223									6.47	
9					0.0244							131	3	6.40	31.17
10	241.17	38.42	181.67	28.939	0.0191	8.91	96	1.4	12.33	93	2.0			6.30	
11					0.0221									6.21	
12					0.0288									6.22	
13					0.0265									6.13	
14					0.0192									6.15	
15					0.0203									6.32	
16					0.0238							1334	2	6.03	49.85
17	247.42	42.10	225.34	38.338	0.0204	9.4	96	1.6	12.56	94	2.1	E3	4	6.16	14.17
18					0.0219									6.02	
19					0.0322									6.38	
20					0.0195									6.32	
21					0.0215									6.26	
22					0.0222									6.34	
23					0.0192							E29	8	6.17	26.81
24	196.35	32.59	122	20.248	0.0199	9.07	95	1.5	10.22	92	1.7			6.33	
25					0.0222									6.38	
26					0.0202									6.36	
27					0.0226									6.43	
28					0.0191									6.41	
29					0.0277									6.35	
30					0.0186							E7	13.5	6.17	14.73
31	266.65	46.92	205.34	36.13	0.0211	12.52	95	2.2	17.67	91	3.1			6.19	
Total	1157.4	205.681	908.35	162.26	0.7322	47.24	479.625	8.355	67.33	462.3	12.13	1465	37	194	
	AVG 231.48	AVG 41.14	AVG 181.67	AVG 32.45	AVG 0.024	AVG 9.45	AVG 95.92	AVG 1.67	AVG 13.47	AVI 92.59	AVE 2.43	GEM 26	AVG 6.17	MIN 6.00	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 266.65	MAX 46.92	MAX 225.34	MAX 38.60	MAX 0.034	AVW 12.52		AVW 2.20	AVW 17.67		AVG 3.23	GMT 131	AVG	MAX 6.47	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	3	131	1334	29	7
Day 4 (CFU/100 mL)			3		
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

7

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.47712125	2.1172713	3.12515583	1.462398	0.84509804
Day 4 (log)			0.47712125		
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.47712125	2.1172713	1.80113854	1.462398	0.84509804
Week Avg:	**3**	**131**	**63**	**29**	**7**

Month Avg (log) 1.41736095

Month Avg:	**26**
HIGHEST WEEKLY	**131**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nı WA0024431 | Month June | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0214									6.24	
2					0.0273									6.46	
3					0.0225									6.38	
4					0.0261									6.47	
5					0.021									6.47	
6					0.0191							E12	17	6.51	29.33
7	310.08	53.53	269.34	46.50	0.0207	7.65	98	1.3	10.34	96	1.8			6.45	
8					0.0192									6.35	
9					0.0249									6.44	
10					0.019									6.37	
11					0.0195									6.50	
12					0.0189									6.52	
13					0.0177							E3	8.5	6.49	5.75
14	529.5	82.14	661	102.54	0.0186	9.31	98	1.4	11.17	98	1.7			6.46	
15					0.0265									6.56	
16					0.027									6.41	
17					0.0224									6.44	
18					0.0198									6.48	
19					0.0229									6.47	
20					0.0209							1334	9	6.40	48.73
21	220.73	36.63	183	30.37	0.0199	9.91	96	1.6	11.57	94	1.9	E8	4.5	6.43	11.25
22					0.0192									6.39	
23					0.023									6.41	
24					0.0169									6.33	
25					0.0191									6.26	
26					0.0174									6.42	
27					0.0186							E4	6.5	6.38	10.50
28	353.8	59.31	282.67	47.39	0.0201	10.42	97	1.7	11.33	96	1.9			6.37	
29					0.0263									6.42	
30					0.0179									6.47	
31															
Total	1414.11	231.612	1396.01	226.792	0.6338	37.29	388.34	6.156	44.41	384.14	7.337	1334	45.5	192.8	
	AVE 353.53	AVG 57.90	AVG 349.00	AVG 56.70	AVG 0.021	AVG 9.32	AVG 97.36	AVG 1.54	AVG 11.10	AVG 96.82	AVG 1.83	GEM 17	AVG 9.10	MIN 6.24	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 529.50	MAX 82.14	MAX 661.00	MAX 102.54	MAX 0.027	AVG 10.42		AVG 1.75	AVG 11.57		AVG 1.92	GMA 103	AVG	MAX 6.56	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMA=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	12	3	1334	4	
Day 4 (CFU/100 mL)			8		
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.07918125	0.47712125	3.12515583	0.60205999	
Day 4 (log)			0.90308999		
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.07918125	0.47712125	2.01412291	0.60205999	#DIV/0!
Week Avg:	**12**	**3**	**103**	**4**	**#DIV/0!**

Month Avg (log) 1.23732166

Month Avg:	**17**
HIGHEST WEEKLY	**103**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month July | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0239									6.51	
2					0.0209									6.45	
3					0.0213									6.51	
4					0.0201							E2	3	6.48	21.25
5	261.05	35.27	196.67	26.57	0.0162	6.73	97	0.9	5.78	97	0.8			6.41	
6					0.0206									6.38	
7					0.0272									6.42	
8					0.0236									6.41	
9					0.0251									6.48	
10					0.0208									6.48	
11					0.0203							E4	4.5	6.36	16.77
12	267.64	37.28	230	32.03	0.0167	12.21	95	1.7	11.39	95	1.6			6.38	
13					0.0271									6.43	
14					0.0252									6.47	
15					0.0185									6.51	
16					0.0202									6.48	
17					0.0209									6.55	
18					0.0174							1334	5	6.49	72.01
19	250.89	36.20	188.34	27.17	0.0173	13.64	95	2.0	16	92	2.3	E49	2	6.48	13.90
20					0.0171									6.47	
21					0.021									6.45	
22					0.0255									6.41	
23					0.0206									6.49	
24					0.018									6.58	
25					0.0163							E17	1.5	6.57	2.84
26	272.66	38.66	209.67	29.73	0.017	8.34	97	1.2	7.39	96	1.0			6.54	
27					0.0172									6.46	
28					0.0248									6.55	
29					0.0177									6.56	
30					0.0178									6.55	
31					0.0186									6.6	
Total	1052.24	147.403	824.68	115.51	0.6349	40.92	384.364	5.76	40.56	380.1	5.724	1334	16	200.9	
	AVG 263.06	AVG 36.85	AVG 206.17	AVG 28.88	AVG 0.020	AVG 10.23	AVG 96.11	AVG 1.44	AVG 10.14	AVG 95.08	AVG 1.43	GEM 25	AVG 3.20	MIN 6.36	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 272.66	MAX 38.66	MAX 230.00	MAX 32.03	MAX 0.027	AVW 13.64		AVW 1.97	AVW 16.00		AVG 2.31	GMF 256	AVG	MAX 6.60	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMF=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	2	4	1334	17	
Day 4 (CFU/100 mL)			49		
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.30103	0.60205999	3.12515583	1.23044892	
Day 4 (log)			1.69019608		
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.30103	0.60205999	2.40767595	1.23044892	#DIV/0!
Week Avg:	**2**	**4**	**256**	**17**	**#DIV/0!**

Month Avg (log) 1.38977816

Month Avg:	**25**
HIGHEST WEEKLY	**256**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month August | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0161							E30	2.5	6.73	30.10
2	241.44	30.81	174	22.20	0.0153	10.12	96	1.3	6.33	96	0.8			6.44	
3					0.025									6.58	
4					0.0156									6.61	
5					0.0176									6.46	
6					0.0182									6.56	
7					0.0239									6.63	
8					0.0181							300	4	6.53	30.04
9	287.36	36.43	209	26.49	0.0152	9.64	97	1.2	8.67	96	1.1			6.48	
10					0.025									6.5	
11					0.0154									6.51	
12					0.0187									6.42	
13					0.0185									6.33	
14					0.0245									6.49	
15					0.0184							E10	4.5	6.46	16.70
16	391	61.63	396	62.42	0.0189	11.48	97	1.8	10.39	97	1.6			6.43	
17					0.0192									6.42	
18					0.0272									6.33	
19					0.0206									6.32	
20					0.017									6.34	
21					0.0243									6.37	
22					0.0156							E14	6.5	6.47	33.28
23	395.2	53.72	350	47.58	0.0163	9.33	98	1.3	9.89	97	1.3			6.37	
24					0.0177									6.37	
25					0.0236									6.41	
26					0.0162									6.41	
27					0.0197									6.35	
28					0.0189									6.39	
29					0.017							<1	3.5	6.44	14.95
30	351.6	47.21	291.67	39.16	0.0161	11.01	97	1.5	9.61	97	1.3			6.42	
31					0.0218									6.47	
Total	1666.6	229.803	1420.67	197.86	0.5956	51.58	484.026	7.07	44.89	483.5	6.179	300	21	200	
	AVG 333.32	AVG 45.96	AVG 284.13	AVG 39.57	AVG 0.019	AVG 10.32	AVG 96.91	AVG 1.41	AVG 8.98	AVW 96.84	AVG 1.24	GEM 17	AVG 4.20	MIN 6.32	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 395.20	MAX 61.63	MAX 396.00	MAX 62.42	MAX 0.027	AVW 11.48		AVW 1.81	AVW 10.39		AVW 1.64	GMT 300	AVG	MAX 6.63	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	30	300	10	14	1
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

					1
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.47712125	2.47712125	1	1.14612804	0
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.47712125	2.47712125	1	1.14612804	0
Week Avg:	**30**	**300**	**10**	**14**	**1**

Month Avg (log) 1.22007411

Month Avg:	**17**
HIGHEST WEEKLY	**300**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month September | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT					EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous	
1					0.0173									6.38		
2					0.0159									6.35		
3					0.0151									6.34		
4					0.0199									6.45		
5					0.0183							E49	6.5	6.39	13.41	
6	275.79	35.19	219	27.945	0.0153	10.7	96	1.4	10.39	95	1.3			6.41		
7					0.0171									6.34		
8					0.0236									6.41		
9					0.0274									6.42		
10					0.0186									6.41		
11					0.0228									6.53		
12					0.0153							E25	6	6.45	31.62	
13	260.38	36.92	205.05	29.072	0.017	11.82	95	1.7	8.5	96	1.2			6.37		
14					0.0179									6.35		
15					0.0278									6.42		
16					0.0163									6.40		
17					0.0168									6.38		
18					0.0237									6.47		
19					0.0189							1054	21.5	6.45	33.42	
20	247.33	34.86	206.67	29.129	0.0169	12.39	95	1.7	8.22	96	1.2	>1	5.5	6.45	13.42	
21					0.023									6.39		
22					0.0263									6.36		
23					0.017									6.33		
24					0.0224									6.36		
25					0.0245									6.43		
26					0.0175							E20	6	6.39	10.10	
27	274.18	38.42	213.5	29.914	0.0168	9.09	97	1.3	8.56	96	1.2			6.37		
28					0.0186									6.35		
29					0.0298									6.34		
30					0.02									6.38		
31																
Total	1057.68	145.384	844.22	116.06	0.5978	44	383.256	6.061	35.67	383.1	4.889	1054	45.5	191.9		
	AVG 264.42	AVG 36.35	AVG 211.06	AVG 29.02	AVG 0.020	AVG 11.00	AVG 95.84	AVG 1.52	AVG 8.92	AVI 95.77	AVE 1.22	GEM 30	AVG 9.10	MIN 6.33		
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**		
	MAX 275.79	MAX 38.42	MAX 219.00	MAX 29.91	MAX 0.030	AVW 12.39		AVW 1.75	AVW 10.39		AVE 1.33	GMT 49	AVW	MAX 6.53		
Limits						**45**		**30**	**45**		**39**	**400**		**9**		

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	49	25	1054	20	
Day 4 (CFU/100 mL)			1		
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.69019608	1.39794001	3.02284061	1.30103	
Day 4 (log)			0		
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.69019608	1.39794001	1.51142031	1.30103	#DIV/0!
Week Avg:	**49**	**25**	**32**	**20**	**#DIV/0!**

Month Avg (log) 1.48240134

Month Avg:	**30**
HIGHEST WEEKLY	**49**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month October | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.02									6.38	
2					0.0214									6.47	
3					0.0181							1334	7.5	6.45	57.44
4	295.26	41.86	240	34.027	0.017	12.5	96	1.8	12.56	95	1.8	E4	5	6.44	7.81
5					0.0182									6.36	
6					0.0169									6.40	
7					0.0259									6.41	
8					0.0173									6.38	
9					0.0177									6.44	
10					0.0156							E217	13.5	6.55	18.59
11	567	79.92	694	97.82	0.0169	9.37	98	1.3	4.4	99	0.6			6.56	
12					0.0244									6.60	
13					0.0172									6.48	
14					0.0157									6.41	
15					0.0156									6.42	
16					0.0215									6.52	
17					0.0184							1334	11.5	6.55	31.75
18	216.75	38.68	199.34	35.58	0.0214	12.72	94	2.3	12.61	94	2.3	236	7.5	6.48	19.84
19					0.0521							68	5	6.35	12.90
20					0.0464									6.22	
21					0.0404									6.30	
22					0.0547									6.18	
23					0.0464									6.29	
24					0.0311							E2	7.5	6.14	20.07
25	182.7	38.55	182	38.40	0.0253	8.5	95	1.8	7.87	96	1.7			6.36	
26					0.0266									6.32	
27					0.03									6.40	
28					0.0217									6.32	
29					0.02									6.30	
30					0.0234									6.43	
31					0.0208							4	4.5	6.49	11.91
Total	1261.71	199.013	1315.34	205.82	0.7781	43.09	383.593	7.157	37.44	383.5	6.312	2976	62	198.4	
	AVG 315.43	AVG 49.75	AVG 328.84	AVG 51.46	AVG 0.025	AVG 10.77	AVG 96.58	AVG 1.79	AVG 9.36	AVE 97.15	AVE 1.58	GEM 61	AVG 7.75	MIN 6.14	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 567.00	MAX 79.92	MAX 694.00	MAX 97.82	MAX 0.055	AVW 12.72		AVW 2.27	AVW 12.61		AVW 2.25	GMT 278	AVG	MAX 6.60	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1334	217	1334	2	4
Day 4 (CFU/100 mL)	4		236		
Day 5 (CFU/100 mL)			68		
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					4
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	3.12515583	2.33645973	3.12515583	0.30103	0.60205999
Day 4 (log)	0.60205999		2.372912		
Day 5 (log)			1.83250891		
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.86360791	2.33645973	2.44352558	0.30103	0.60205999
Week Avg:	**73**	**217**	**278**	**2**	**4**

Month Avg (log)	1.78716779
Month Avg:	**61**
HIGHEST WEEKLY	**278**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit N WA0024431 | Month November | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant T RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1	222.98	34.59	169.67	26.32	0.0186	14.25	94	2.2	9.42	94	1.5			6.49	
2					0.0276									6.56	
3					0.0301									6.59	
4					0.023									6.48	
5					0.0265									6.41	
6					0.0258									6.39	
7					0.0211							E4	6.5	6.42	10.21
8	293.09	52.55	257	46.08	0.0215	11.26	96	2.0	8.9	97	1.6			6.47	
9					0.0298									6.49	
10					0.0229									6.51	
11					0.022									6.47	
12					0.033									6.43	
13					0.0532									6.42	
14					0.055							E64	10.5	6.33	36.21
15	120.3	115.68	131.34	126.30	0.1153	18.37	85	17.7	18.17	86	17.5			5.85	
16					0.073									6.31	
17					0.0609									6.48	
18					0.0578									6.30	
19					0.0445									6.43	
20					0.0513									6.44	
21					0.0553							E27	10	6.30	22.17
22	59.91	67.10	64.17	71.87	0.1343	17.72	70	19.8	14.78	77	16.6			6.02	
23					0.1089									6.17	
24					0.0806									6.21	
25					0.0647									6.16	
26					0.0802									6.05	
27					0.0863									6.40	
28					0.064							527	7	6.25	50.42
29	120.45	63.89	117.17	62.15	0.0636	12.13	90	6.4	10.1	91	5.4	E4	5	6.31	16.24
30					0.0537									6.50	
31															
Total	816.73	333.817	739.35	332.724	1.6045	73.73	434.849	48.176	61.37	445.5	42.441	527	39	190.6	
	AVG 163.35	AVG 66.76	AVG 147.87	AVG 66.54	AVG 0.053	AVG 14.75	AVG 90.97	AVG 9.64	AVG 12.27	AVG 91.70	AVG 8.49	GEM 27	AVG 7.80	MIN 5.85	
Permit		135		171	0.12	30	85	20	30	85	26	200		6	
	MAX 293.09	MAX 115.68	MAX 257.00	MAX 126.30	MAX 0.134	AVG 18.37		AVG 19.85	AVG 18.17		AVG 17.47	GMT 64	AVG	MAX 6.59	
Limits						45		30	45		39	400		9	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	4	64	27	527	
Day 4 (CFU/100 mL)				4	
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.60205999	1.80617997	1.43136376	2.72181062	
Day 4 (log)				0.60205999	
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.60205999	1.80617997	1.43136376	1.6619353	#DIV/0!
Week Avg:	**4**	**64**	**27**	**46**	**#DIV/0!**

Month Avg (log) 1.43269487

Month Avg:	**27**
HIGHEST WEEKLY	**64**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

'ermit Nc WA0024431 | Month Dcember | Year 2017

Facility Na Clallam Bay POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Ty RBC | Population 300

	INFLUENT				EFFLUENT										
Freque	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS w/fecal	pH STANDARD UNITS	Flow gpm Instantaneous
1					0.0708									6.29	
2					0.0714									9.09	
3					0.0615									6.51	
4					0.0485									6.38	
5					0.0405							E5	8	6.26	15.88
6	166.07	51.94	126.34	39.51	0.0375	11.88	93	3.7	9.68	92	3.0			6.41	
7					0.0441									6.34	
8					0.0338									6.15	
9					0.0317									6.36	
10					0.0282									6.55	
11					0.0328									6.62	
12					0.0261							1334	12	6.51	41.50
13	222.87	46.47	219	45.66	0.025	14.08	94	2.9	16.13	93	3.4	E14	8.5	6.43	15.11
14					0.0232									6.42	
15					0.0341									6.50	
16					0.021									6.34	
17					0.0217									6.37	
18					0.0364									6.41	
19					0.0334							E5	11	6.42	17.00
20	155.76	54.30	133.17	46.42	0.0418	14.59	91	5.1	15.83	88	5.5			6.39	
21					0.0388									6.34	
22					0.0422									6.40	
23					0.038									6.40	
24					0.0337									6.42	
25					0.0317									6.23	
26					0.0316							E32	10.5	6.38	37.23
27	222.19	55.59	197	49.289	0.03	12.61	94	3.2	15.17	92	3.8			6.37	
28					0.0372									6.44	
29					0.0587									6.16	
30					0.0953									5.89	
31					0.0577									6.50	
Total	766.89	208.299	675.51	180.89	1.2584	53.16	371.487	14.89	56.81	365.4	15.7	1334	50	200.3	
	AVG 191.72	AVG 52.07	AVG 168.88	AVG 45.22	AVG 0.041	AVG 13.29	AVG 93.07	AVG 3.72	AVG 14.20	AVI 91.59	AVG 3.93	GEM 27	AVG 10.00	MIN 5.89	
Permit		**135**		**171**	**0.12**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 222.87	MAX 55.59	MAX 219.00	MAX 49.29	MAX 0.095	AVW 14.59		AVW 5.09	AVW 16.13		AVG 5.52	GMF 137	AVW	MAX 6.62	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations **Mail to P.O. Box 47775, Olympia WA 98504-7775**

Kim Malakoff - Senior Operator

Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Clallam Bay 8/11

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	5	1334	5	32	
Day 4 (CFU/100 mL)		14			
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.69897	3.12515583	0.69897	1.50514998	
Day 4 (log)		1.14612804			
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.69897	2.13564193	0.69897	1.50514998	#DIV/0!

Week Avg:	**5**	**137**	**5**	**32**	**#DIV/0!**

Month Avg (log) 1.43487477

Month Avg:	**27**
HIGHEST WEEKLY	**137**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

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WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024431 — Month January — Year 2018

Facility Na Clallam Bay POTW — County Clallam

Receiving Water Strait of Juan de Fuca — Plant Operator Kim Malakoff

Plant Ty RBC — Population 500

Frequ					EFFLUENT CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK		5/WEEK	W/fecal
					FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	TSS mg/fecal		pH STANDARD UNITS	Flow gpm instantaneous
1					0.0513										6.39	
2					0.0412							E607	7.5		6.38	57.87
3	177.75	83.81	137	41.48	0.0363	13.07	93	4.0	14.13	90	4.3	E5	7.5		6.33	12.97
4					0.0351										6.02	
5					0.0349										6.26	
6					0.0405										6.31	
7					0.0344										6.28	
8					0.0434										6.29	
9					0.0378							E5	9.5		6.33	16.99
10	139.47	41.87	100	30.02	0.036	12.67	91	3.8	12.72	87	3.8				6.38	
11					0.0359										6.52	
12					0.09										6.56	
13					0.0635										6.19	
14					0.0563										6.35	
15					0.0481										6.22	
16					0.0418							E10	10		6.26	26.95
17	128.82	46.30	118.17	42.48	0.0431	11.96	91	4.3	14	88	5.0				6.25	
18					0.0619										6.44	
19					0.0612										6.27	
20					0.0669										6.48	
21					0.0916										6.03	
22					0.1047										6.25	
23					0.0718							E15	8.5		6.16	24.93
24	61.95	97.33	71.5	43.11	0.0723	10.29	83	6.2	13.39	81	8.1				6.19	
25					0.0705										6.20	
26					0.0673										6.32	
27					0.0705										6.10	
28					0.0676										6.44	
29					0.1235										6.17	
30					0.1127										6.10	
31	170.3	107.94	116	73.53	0.076	11.39	93	7.2	9.4	92	6.0	E7	6.5			30.11
Total	678.29	287.289	542.67	230.61	1.8881	59.36	450.98	25.48	63.64	438.3	27.16	0	49.5		188.5	
	135.66	57.46	108.53	46.12	0.061	11.88	91.25	5.10	12.73	86.27	5.43	16	8.25		6.02	
							85	20	30	65	30	200				
	177.75	107.94	137.00	73.53	0.124	13.07		7.22	14.13		8.07	55			6.56	
												400				

AVG=Average AVW =Highest Weekly Average GEM=Geometric Mean MAX=Maximum MIN=Minimum
GM7=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator

Name and Title

Signature

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024431 **Permittee:** CLALLAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 02/01/2018 - 02/28/2018 **Outfall:** 001 - Clallam Bay Strait of Juan de Fuca **Version:** 2

Week	Monitoring Point	Flow MGD Continuous Recorded 50050	Biochemical Oxygen Demand (BOD5) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 00310	Biochemical Oxygen Demand (BOD5) Percent Monthly Calculated 81010	Biochemical Oxygen Demand (BOD5) Lbs/Day Weekly Composite - 24 HR Time 00310	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 00530	Solids (Residue) Total suspended (TSS) Percent Monthly Calculated 81011	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time 00530	Fecal Coliform #/100ml Weekly Grab 74055	pH Standard Units S/Week Grab 00400
1-Th	2/1/18	.0735								6.21
1-F	2/2/18	.0626								6.24
1-Sa	2/3/18	.0605								6.28
2-Su	2/4/18	.0596								6.37
2-M	2/5/18	.0492								6.36
2-T	2/6/18	.042							12	6.43
2-W	2/7/18	.0396	11.74	92	3.9	12	89	4.0		6.39
2-Th	2/8/18	.0375								6.49
2-F	2/9/18	.04								6.49
2-Sa	2/10/18	.0318								6.35
3-Su	2/11/18	.0287								6.34
3-M	2/12/18	.0341								6.33
3-T	2/13/18	.026							1334	6.31
3-W	2/14/18	.0289	21.81	89	5.3	19.27	85	4.6	107	6.27
3-Th	2/15/18	.0264								6.34
3-F	2/16/18	.0384								6.41
3-Sa	2/17/18	.0252								6.38
4-Su	2/18/18	.0341								6.37
4-M	2/19/18	.0287								6.39
4-T	2/20/18	.0262							10	6.15
4-W	2/21/18	.0268	18.08	92	4.0	18.76	88	4.2		6.32
4-Th	2/22/18	.0241								6.19
4-F	2/23/18	.0299								6.48
4-Sa	2/24/18	.0264								6.37
5-Su	2/25/18	.0276								6.29
5-M	2/26/18	.0346								6.54
5-T	2/27/18	.0269							86	6.37
5-W	2/28/18	.0264	13.40	91	3	2.5	98	.6		6.29
Minimum										6.15
										>= 6.0
Average		0.0363464	16.2575	90.88	4.05	13.1325	89.51	3.35		
		DL: 0.12	<= 30	>= 85	<= 20	<= 30	>= 85	<= 26		
Weekly Average			21.81		5.26	19.27		4.64		
			<= 45		<= 30	<= 45		<= 39		
Maximum		0.0735								6.54
		Report Only								<= 9.0
Geometric Mean									68.1779	
									<= 200	
Weekly Geometric Mean									378	
									<= 400	

Washington State Department of Ecology **Discharge Monitoring Report (DMR)**

Permit Number: WA0024431 **Facility:** CLALLAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 02/01/2018 - 02/28/2018 **Outfall:** INFL - Influent Headworks **Version:** 2

Week	Monitoring Point	Biochemical Oxygen Demand (BOD5) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Biochemical Oxygen Demand (BOD5) Lbs/Day Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time
1-Th	2/1/18				
1-F	2/2/18				
1-Sa	2/3/18				
2-Su	2/4/18				
2-M	2/5/18				
2-T	2/6/18				
2-W	2/7/18	139.12	45.95	106.3	3517
2-Th	2/8/18				
2-F	2/9/18				
2-Sa	2/10/18				
3-Su	2/11/18				
3-M	2/12/18				
3-T	2/13/18				
3-W	2/14/18	207.25	49.95	131.5	3169
3-Th	2/15/18				
3-F	2/16/18				
3-Sa	2/17/18				
4-Su	2/18/18				
4-M	2/19/18				
4-T	2/20/18				
4-W	2/21/18	212.83	47.57	156.34	34.94
4-Th	2/22/18				
4-F	2/23/18				
4-Sa	2/24/18				
5-Su	2/25/18				
5-M	2/26/18				
5-T	2/27/18				
5-W	2/28/18	154.47	34.01	106.5	23.45
Average		178.42	44.37	125.21	31.32
		Report Only	DL: 136	Report Only	DL: 171
Maximum		212.83	49.95	156.34	35.17
		Report Only	Report Only	Report Only	Report Only

Washington State Department of Ecology **Discharge Monitoring Report (DMR)**

Permit Number: WA0024431 **Permittee:** CLALLAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 03/01/2018 - 03/31/2018 **Outfall:** 001 - Clallam Bay Strait of Juan de Fuca

Version: 1

Week	Monitoring Point	Flow MGD Continuous Recorded 00056	Biochemical Oxygen Demand (BOD5) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 00310	Biochemical Oxygen Demand (BOD5) Percent Monthly Calculated 81010	Biochemical Oxygen Demand (BOD5) Lbs/Day Weekly Composite - 24 HR Time 00310	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 00530	Solids (Residue) Total suspended (TSS) Percent Monthly Calculated 81011	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time 00530	Fecal Coliform Bacteria Weekly Grab 31616	pH Standard Units S/Week Grab 00400
1-Th	3/1/18	.0294								6.45
1-F	3/2/18	.0380								6.38
1-Sa	3/3/18	.0254								6.21
2-Su	3/4/18	.0265								6.30
2-M	3/5/18	.0279								6.42
2-T	3/6/18	.0238							B[1	6.30
2-W	3/7/18	.0246	10.90	96	2.25	7.4	97.22	1.53		6.14
2-Th	3/8/18	.0274								6.62
2-F	3/9/18	.0288								6.43
2-Sa	3/10/18	.0247								6.14
3-Su	3/11/18	.0221								6.41
3-M	3/12/18	.0206								6.36
3-T	3/13/18	.0188							4	6.31
3-W	3/14/18	.0202	10.74	95	1.81	9.07	94.47	1.53		6.16
3-Th	3/15/18	.0197								6.22
3-F	3/16/18	.0319								6.41
3-Sa	3/17/18	.0182								6.26
4-Su	3/18/18	.0204								6.29
4-M	3/19/18	.0178								6.36
4-T	3/20/18	.0160							3	6.34
4-W	3/21/18	.0170	14.56	94	2.06	14.56	92	2.06		6.26
4-Th	3/22/18	.0248								6.28
4-F	3/23/18	.0247								6.34
4-Sa	3/24/18	.0213								6.14
5-Su	3/25/18	.0201								6.42
5-M	3/26/18	.0244								6.42
5-T	3/27/18	.0213							35	6.35
5-W	3/28/18	.0228	12.57	95	2.39	13.94	91.88	2.65		J[5.94*
5-Th	3/29/18	.0202								6.57
5-F	3/30/18	.0210								6.56
5-Sa	3/31/18	.0276								6.53
Minimum										5.94*
										>= 6.0
Average		0.023471	12.1925	95	2.1275	11.2425	93.89	1.9425		
		DL: 0.12	<= 30	>= 85	<= 20	<= 30	>= 85	<= 26		
Weekly Average			14.56		2.39	14.56		2.65		
			<= 45		<= 30	<= 45		<= 39		
Maximum		0.038								6.62
		Report Only								<= 9.0
Geometric Mean									5	
									<= 200	

Washington State Department of Ecology Discharge Monitoring Report (DMR)

Permit Number: WA0024431 **Permittee:** CLALLAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 03/01/2018 - 03/31/2018 **Outfall:** INFL - Influent Headworks **Version:** 1

Week	Monitoring Point	Biochemical Oxygen Demand (BOD5) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Biochemical Oxygen Demand (BOD5) Lbs/Day Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time
1-Th	3/1/18				
1-F	3/2/18				
1-Sa	3/3/18				
2-Su	3/4/18				
2-M	3/5/18				
2-T	3/6/18				
2-W	3/7/18	280.24	57.96	266	55.02
2-Th	3/8/18				
2-F	3/9/18				
2-Sa	3/10/18				
3-Su	3/11/18				
3-M	3/12/18				
3-T	3/13/18				
3-W	3/14/18	205.77	34.67	164	27.63
3-Th	3/15/18				
3-F	3/16/18				
3-Sa	3/17/18				
4-Su	3/18/18				
4-M	3/19/18				
4-T	3/20/18				
4-W	3/21/18	243.47	34.52	180.34	25.57
4-Th	3/22/18				
4-F	3/23/18				
4-Sa	3/24/18				
5-Su	3/25/18				
5-M	3/26/18				
5-T	3/27/18				
5-W	3/28/18	261.77	49.78	171.67	32.64
5-Th	3/29/18				
5-F	3/30/18				
5-Sa	3/31/18				
Average		247.81	44.23	195.50	35.22
		Report Only	DL: 135	Report Only	DL: 171
Maximum		280.24	57.96	266	55.02
		Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, J - Estimated Value/Below Quantitation Limit

Washington State Department of Ecology **Discharge Monitoring Report (DMR)**

Permit Number: WA0024431 **Permittee:** CLALLAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 04/01/2018 - 04/30/2018 **Outfall:** 001 - Clallam Bay Strait of Juan de Fuca **Version:** 1

Week	Monitoring Point	Flow (MGD) Continuous Recorded 001	Biochemical Oxygen Demand (80082) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 001	Biochemical Oxygen Demand (80082) Percent Summary Only Calculated 001	Biochemical Oxygen Demand (80082) Lbs/Day Weekly Composite - 24 HR Time 001	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 001	Solids (Residue) Total suspended (TSS) Percent Summary Only Calculated 001	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time 001	Fecal Coliform #/100ml Weekly Grab 001	pH Standard Units #/Week Grab 001
1-Su	4/1/18	.0192								6.44
1-M	4/2/18	.0190								6.48
1-T	4/3/18	.0174							15	6.44
1-W	4/4/18	.0166	11.80	95	1.63	13.39	92	1.85		6.26
1-Th	4/5/18	.0242								6.24
1-F	4/6/18	.0380								6.31
1-Sa	4/7/18	.0302								6.46
2-Su	4/8/18	.0444								6.27
2-M	4/9/18	.0449								6.29
2-T	4/10/18	.0346							400	6.28
2-W	4/11/18	.0321	7.35	96	0.958	8.78	94	2.35	10	6.28
2-Th	4/12/18	.0488								6.31
2-F	4/13/18	.0318								6.10
2-Sa	4/14/18	.0531								6.43
3-Su	4/15/18	.0445								6.25
3-M	4/16/18	.0426								6.42
3-T	4/17/18	.0418							19	6.37
3-W	4/18/18	.0368	11.34	95	3.48	14.89	89	4.57		6.32
3-Th	4/19/18	.0324								6.16
3-F	4/20/18	.0326								6.12
3-Sa	4/21/18	.0308								6.40
4-Su	4/22/18	.0269								6.25
4-M	4/23/18	.0291								6.48
4-T	4/24/18	.0247							240	6.29
4-W	4/25/18	.0230	12.46	94	2.39	12.39	91	2.38		6.20
4-Th	4/26/18	.0306								6.29
4-F	4/27/18	.0222								6.21
4-Sa	4/28/18	.0210								6.28
5-Su	4/29/18	.0237								6.29
5-M	4/30/18	.0258								6.31
Minimum										6.1
										>= 6.0 (RO)
Average		0.0314267	10.7425	95	2.1145	12.3625	91.5	2.7875		
		DL: 0.12	<= 30	>= 85	<= 20	<= 30	>= 85	<= 26		
Weekly Average			12.46		3.48	14.89		4.57		
			<= 45		<= 30	<= 45		<= 39		
Maximum		0.0531								6.48
		Report Only								<= 9.0 (RO)
Geometric Mean									48.6881	
									<= 200	
Weekly Geometric Mean									240	
									<= 400	

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024431 [redacted] SAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 04/01/2018 - 04/30/2018 **Outfall:** INFL - Influent Headworks **Version:** 1

Week	Monitoring Point	Biochemical Oxygen Demand (BOD5) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Biochemical Oxygen Demand (BOD5) Lbs/Day Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time
1-Su	4/1/18				
1-M	4/2/18				
1-T	4/3/18				
1-W	4/4/18	257.94	35.71	161.0	22.02
1-Th	4/5/18				
1-F	4/6/18				
1-Sa	4/7/18				
2-Su	4/8/18				
2-M	4/9/18				
2-T	4/10/18				
2-W	4/11/18	175.44	46.97	144.0	38.55
2-Th	4/12/18				
2-F	4/13/18				
2-Sa	4/14/18				
3-Su	4/15/18				
3-M	4/16/18				
3-T	4/17/18				
3-W	4/18/18	223.76	68.67	138.5	42.51
3-Th	4/19/18				
3-F	4/20/18				
3-Sa	4/21/18				
4-Su	4/22/18				
4-M	4/23/18				
4-T	4/24/18				
4-W	4/25/18	200.04	38.37	131.24	25.19
4-Th	4/26/18				
4-F	4/27/18				
4-Sa	4/28/18				
5-Su	4/29/18				
5-M	4/30/18				
Average		214.295	47.43	143.685	32.0675
		Report Only	DL: 135	Report Only	DL: 171
Maximum		257.94	68.67	161	42.51
		Report Only	Report Only	Report Only	Report Only

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024431 **Permittee:** CLALLAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 05/01/2018 - 05/31/2018 **Outfall:** 001 - Clallam Bay Strait of Juan de Fuca

Version: 1

Week	Monitoring Point	Flow MGD Continuous Recorded 001	Biochemical Oxygen Demand (BOD5) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 001	Biochemical Oxygen Demand (BOD5) Percent Summary Only Calculated 001	Biochemical Oxygen Demand (BOD5) Lbs/Day Weekly Composite - 24 HR Time 001	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time 001	Solids (Residue) Total suspended (TSS) Percent Summary Only Calculated 001	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time 001	Fecal Coliform #/100ml Weekly Grab 001	pH Standard Units S/Week Grab 001
1-T	5/1/18	.0201							5	6.36
1-W	5/2/18	.0190	11.58	95	11.58	14.90	91	2.37		6.27
1-Th	5/3/18	.0270								6.29
1-F	5/4/18	.0269								6.34
1-Sa	5/5/18	.0196								6.25
2-Su	5/6/18	.0190								6.28
2-M	5/7/18	.0203								6.37
2-T	5/8/18	.0172							125	6.38
2-W	5/9/18	.0169	11.59	97	1.63	13.33	95	1.88		6.37
2-Th	5/10/18	.0194								6.40
2-F	5/11/18	.0199								6.42
2-Sa	5/12/18	.0294								6.46
3-Su	5/13/18	.0180								6.32
3-M	5/14/18	.0176								6.45
3-T	5/15/18	.0172							198	6.49
3-W	5/16/18	.0165	14.40	95	1.98	14.26	93	1.97		6.56
3-Th	5/17/18	.0224								6.56
3-F	5/18/18	.0179								6.48
3-Sa	5/19/18	.0155								6.46
4-Su	5/20/18	.0195								6.45
4-M	5/21/18	.0187								6.51
4-T	5/22/18	.0183							10	6.51
4-W	5/23/18	.0167	13.11	95	1.83	12.94	93	1.80		6.54
4-Th	5/24/18	.0274								6.58
4-F	5/25/18	.0145								6.43
4-Sa	5/26/18	.0187								6.27
5-Su	5/27/18	.0192								6.28
5-M	5/28/18	.0218								6.39
5-T	5/29/18	.0212							64	6.51
5-W	5/30/18	.0160	13.64	95	1.82	16.09	92	2.15		6.42
5-Th	5/31/18	.0185								6.47
Minimum										6.25
										>= 6.0 (RO)
Average		0.0196871	12.864	95.4	3.768	14.308	92.8	2.034		
		DL: 0.12	<= 30	>= 85	<= 20	<= 30	>= 85	<= 26		
Weekly Average			14.40		11.58	16.09		2.37		
			<= 45		<= 30	<= 45		<= 39		
Maximum		0.0294								6.58
		Report Only								<= 9.0 (RO)
Geometric Mean									38	
									<= 200	

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024431 **Permittee:** CLALLAM BAY STP

Facility County: Clallam **Receiving Waterbody:**

Monitoring Period: 05/01/2018 - 05/31/2018 **Outfall:** INFL - Influent Headworks **Version:** 1

Week	Monitoring Point	Biochemical Oxygen Demand (BOD5) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Biochemical Oxygen Demand (BOD5) Lbs/Day Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite - 24 HR Time	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Composite - 24 HR Time
		INFL	INFL	INFL	INFL
1-T	5/1/18				
1-W	5/2/18	260.66	38.72	173.67	27.52
1-Th	5/3/18				
1-F	5/4/18				
1-Sa	5/5/18				
2-Su	5/6/18				
2-M	5/7/18				
2-T	5/8/18				
2-W	5/9/18	338.20	47.67	293.34	41.35
2-Th	5/10/18				
2-F	5/11/18				
2-Sa	5/12/18				
3-Su	5/13/18				
3-M	5/14/18				
3-T	5/15/18				
3-W	5/16/18	305.06	41.98	219.34	30.18
3-Th	5/17/18				
3-F	5/18/18				
3-Sa	5/19/18				
4-Su	5/20/18				
4-M	5/21/18				
4-T	5/22/18				
4-W	5/23/18	262.28	36.53	186.67	26
4-Th	5/24/18				
4-F	5/25/18				
4-Sa	5/26/18				
5-Su	5/27/18				
5-M	5/28/18				
5-T	5/29/18				
5-W	5/30/18	296.90	39.62	213.34	28.47
5-Th	5/31/18				
Average		289.055	41.475	217.272	30.704
		Report Only	DL: 135	Report Only	DL: 171
Maximum		338.2	47.67	293.34	41.35
		Report Only	Report Only	Report Only	Report Only

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month January | Year 2015

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0449								8.22	6.86	
2					0.0437								9.30	6.83	
3					0.0396								8.67	6.78	
4					0.0543								9.09	7.21	
5					0.3498								9.53	6.79	
6					0.3048							24	9.78	6.94	
7	9.44	10.4	3.75	4.13	0.1321	3.22	66	3.5	2	47	2.2		9.71	7.04	
8					0.0832								9.39	6.96	
9					0.0574								9.49	6.87	
10					0.0484								9.61	6.81	
11					0.0563								9.76	6.85	
12					0.039								9.76	6.82	
13					0.0388							<1	9.61	6.86	
14	42.76	13.02	33.5	10.20	0.0365	4.94	88	1.5	3.17	91	1.0		9.53	6.84	
15					0.0384								9.26	6.85	
16					0.0712								9.39	6.65	
17					0.0539								9.39	6.71	
18					0.2644								9.53	6.79	
19					0.2646								9.53	6.86	
20					0.1337							28	9.36	7.05	
21	24.4	15.87	11	7.16	0.078	4.5	82	2.9	0.6	95	0.4		9.41	7.01	
22					0.0713								9.46	6.70	
23					0.0904								9.85	6.86	
24					0.2168								10.00	6.80	
25					0.1255								9.08	7.05	
26					0.0742								10.00	6.86	
27					0.0629							E15	10.10	7.01	
28	43.14	17.85	21.8	9.02	0.0496	4.24	90	1.8	3	86	1.2		9.93	6.88	
29					0.0453								9.51	6.84	
30					0.0464								9.44	7.19	
31					0.0429								9.29	6.67	
Total	119.74	57.135	70.05	30.5028	3.0583	16.9	326.07	9.7326	8.77	317.988	4.7997	52	293.98	213.2	
	AVG 29.94	AVG 14.28	AVG 17.51	AVG 7.63	AVG 0.099	AVG 4.23	AVG 85.89	AVG 2.43	AVG 2.19	AVG 87.48	AVG 1.20	GEM 10	AVG 9.46	MIN 6.65	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 43.14	MAX 17.85	MA 33.50	MAX 10.20	MAX 0.350	AVG 4.94		AVG 3.55	AVG 3.17		AVG 2.20	GM 28	MAX 10.10	MA 7.21	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	24	1	28	15	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.38021124	0	1.44715803	1.17609126	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.38021124	0	1.44715803	1.17609126	#DIV/0!
Week Avg:	**24**	**1**	**28**	**15**	**#DIV/0!**

Month Avg (log) 1.00086513

Month Avg:	**10**
HIGHEST WEEKLY	**28**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** February **Year** 2015

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0477								9.49	6.37	
2					0.0362								9.62	6.86	
3					0.0389							<1	9.83	6.80	
4	66.05	19.83	76.5	22.97	0.036	4.71	93	1.4	3.36	96	1.0		9.76	6.74	
5					0.105								10.17	6.66	
6					0.3768								10.20	6.79	
7					0.3758								10.20	6.72	
8					0.212								10.15	6.80	
9					0.1283								10.27	6.92	
10					0.1415							E2	10.30	6.95	
11	20.46	15.95	20.5	15.99	0.0935	3.51	83	2.7	3.89	81	3.0		10.22	7.00	
12					0.0762								10.30	6.84	
13					0.0897								10.54	6.84	
14					0.0709								10.57	6.72	
15					0.0652								10.52	6.78	
16					0.0466								10.12	6.83	
17					0.0448							<1	9.89	6.77	
18	107.37	35.82	101.67	33.92	0.040	5.03	95	1.7	2.89	97	1.0		9.95	6.79	
19					0.0408								10.22	6.65	
20					0.0436								10.39	6.50	
21					0.0373								10.30	6.43	
22					0.0498								9.90	6.38	
23					0.0329								9.39	6.46	
24					0.0363							<1	9.06	6.43	
25	78.29	20.83	53.17	14.15	0.0319	4.45	94	1.2	3.28	94	0.9		9.49	6.86	
26					0.0364								9.89	6.38	
27					0.0695								9.90	6.46	
28					0.064								9.68	6.61	
29															
30															
31															
Total	272.17	92.433	251.84	87.0168	2.4676	17.7	365.34	7.0131	13.42	367.621	5.8789	0	280.32	187.3	
	AVG 68.04	AVG 23.11	AVE 62.96	AVG 21.75	AVG 0.088	AVG 4.43	AVG 93.50	AVG 1.75	AVG 3.36	AVG 94.67	AVG 1.47	GEM 1	AVG 10.01	MIN 6.37	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 107.37	MAX 35.82	MAX 101.67	MAX 33.92	MAX 0.377	AVW 5.03		AVW 2.74	AVW 3.89		AVW 3.03	GMI 2	MAX 10.57	MAX 7.00	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMI=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	2	1	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.30103	0	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.30103	0	0	#DIV/0!
Week Avg:		2	1	1	#DIV/0!

Month Avg (log) 0.0752575

Month Avg:	1
HIGHEST WEEKLY	2

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** March **Year** 2015

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0662								9.39	6.70	
2					0.0455								9.49	6.69	
3					0.0482							<1	9.19	6.63	
4	53.4	16.48	44.5	13.73	0.037	3.59	93	1.1	2.58	94	0.8		12.73	6.55	
5					0.0388								8.92	6.55	
6					0.0318								9.39	6.52	
7					0.035								9.29	6.39	
8					0.0443								9.63	6.44	
9					0.0304								9.76	6.38	
10					0.0363							E2	9.93	6.35	
11	80.75	23.84	69	20.37	0.0354	5.15	94	1.5	3.89	94	1.1		10.42	6.38	
12					0.0442								10.91	6.40	
13					0.0439								10.84	6.81	
14					0.0612								10.69	6.60	
15					0.1065								10.44	6.67	
16					0.2049								9.85	6.86	
17					0.1026							256	9.98	6.90	
18	36.51	20.49	26.5	14.87	0.0673	3.3	91	1.9	2.78	90	1.6		10.03	7.42	
19					0.0545								10.12	6.66	
20					0.1428								10.35	6.69	
21					0.1984								10.47	6.84	
22					0.1869								10.20	6.99	
23					0.0954								10.12	6.87	
24					0.0917							E12	10.35	6.89	
25	32.81	24.35	33	24.49	0.089	4.18	87	3.1	3.22	90	2.4		10.47	6.91	
26					0.1536								10.79	6.83	
27					0.0833								11.01	6.88	
28					0.0923								10.83	6.81	
29					0.0819								10.83	6.79	
30					0.1471								11.03	6.79	
31					0.1236							E7	10.71	6.92	
Total	203.47	85.164	173	73.4716	2.62	16.22	365.12	7.5831	12.47	368.316	5.895	256	318.16	208.1	
	AVG 50.87	AVG 21.29	AVG 43.25	AVG 18.37	AVG 0.085	AVG 4.06	AVG 92.03	AVG 1.90	AVG 3.12	AVG 92.79	AVG 1.47	GEM 8	AVG 10.26	MIN 6.35	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 80.75	MAX 24.35	MA 69.00	MAX 24.49	MAX 0.205	AVW 5.15		AVW 3.10	AVW 3.89		AVW 2.39	GMT 256	MAX 12.73	MA 7.42	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	2	256	12	7
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

7

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.30103	2.40823997	1.07918125	0.84509804
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.30103	2.40823997	1.07918125	0.84509804
Week Avg:		**2**	**256**	**12**	**7**

Month Avg (log) 0.92670985

Month Avg:	**8**
HIGHEST WEEKLY	**256**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** April **Year** 2015

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1	23.58	20.53	23.4	20.37	0.1044	4.57	81	4.0	3.5	85	3.0		10.69	6.95	
2					0.0919								10.59	6.92	
3					0.0667								10.49	7.10	
4					0.0721								10.59	6.78	
5					0.094								10.74	6.79	
6					0.0548								10.88	6.93	
7					0.0491							E7	11.08	6.71	
8	46.08	17.99	56	21.86	0.0468	3.94	91	1.5	6.08	89	2.4		16.08	6.77	
9					0.0424								11.22	6.70	
10					0.0375								10.66	6.52	
11					0.0654								10.71	6.44	
12					0.077								10.59	6.72	
13					0.0527								10.42	6.72	
14					0.0785							E4	10.49	6.85	
15	51.2	30.53	53.5	31.90	0.0715	4.37	91	2.6	2.28	96	1.4		10.68	6.90	
16					0.0558								11.22	6.90	
17					0.0454								11.52	6.77	
18					0.0477								11.76	6.72	
19					0.054								11.93	6.54	
20					0.0365								12.36	6.78	
21					0.036								11.59	6.47	
22	106.46	30.54	90	25.82	0.0344	4.19	96	1.2	3	97	0.9	<1	11.52	6.47	
23					0.0379								11.27	6.47	
24					0.048								11.37	6.33	
25					0.048								11.54	6.48	
26					0.0485								11.35	6.58	
27					0.0376								12.32	6.55	
28					0.0369							<1	12.27	6.51	
29	113.76	36.05	78.5	24.88	0.038	4.67	96	1.5	3.17	96	1.0		11.95	6.44	
30					0.0427								12.46	6.44	
31															
Total	341.08	135.643	301.4	124.833	1.6522	21.74	455.49	10.805	18.03	462.552	8.6454	0	342.34	200.3	
	AVG 68.22	AVG 27.13	AVG 60.28	AVG 24.97	AVG 0.055	AVG 4.35	AVG 93.63	AVG 2.16	AVG 3.61	AVG 94.02	AVG 1.73	GEM 2	AVG 11.41	MIN 6.33	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 113.76	MAX 36.05	MA 90.00	MAX 31.90	MAX 0.094	AVW 4.67		AVW 3.98	AVW 6.08		AVW 3.05	GMT 7	MAX 16.08	MA 7.10	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

Please Circle ALL Permit Violations **Mail to P.O. Box 47775, Olympia WA 98504-7775**

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	7	4	1	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.84509804	0.60205999	0	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.84509804	0.60205999	0	0	#DIV/0!
Week Avg:	**7**	**4**	**1**	**1**	**#DIV/0!**

Month Avg (log) 0.36178951

Month Avg:	**2**
HIGHEST WEEKLY	7

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month May | Year 2015

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0332								12.20	6.54	
2					0.0393								12.78	6.56	
3					0.0425								12.82	6.58	
4					0.0326								12.44	6.47	
5					0.0325							E2	12.24	6.62	
6	109.12	31.94	70	20.49	0.0351	5.28	95	1.5	2.22	97	0.6		12.75	6.48	
7					0.0429								12.99	6.47	
8					0.0273								12.50	6.42	
9					0.0421								13.59	6.58	
10					0.0377								13.47	6.44	
11					0.0323								13.21	6.41	
12					0.034							<1	13.28	6.38	
13	111.47	36.91	87	28.81	0.0397	6.85	94	2.3	2.06	98	0.7		12.97	6.46	
14					0.0344								13.93	6.45	
15					0.0354								13.83	6.00	
16					0.0402								13.55	6.14	
17					0.05								14.72	6.16	
18					0.0291								15.13	6.11	
19					0.0251							<1	15.03	5.96	
20	174.56	37.27	108.5	23.17	0.0256	9.89	94	2.1	5.61	95	1.2		15.08	6.08	
21					0.0317								15.39	6.15	
22					0.0347								14.70	6.09	
23					0.0473								15.22	6.32	
24					0.0567								15.75	6.43	
25					0.0331								15.46	6.32	
26					0.0305							E14	16.49	6.28	
27	168.1	29.86	156	27.71	0.0213	18.2	89	3.2	20.75	87	3.7		16.84	6.04	
28					0.0213								16.61	5.92	
29					0.0223								16.77	6.06	
30					0.0275								16.25	5.86	
31					0.0366								15.80	6.27	
Total	563.25	135.98	421.5	100.174	1.074	40.22	372.52	9.1583	30.64	375.989	6.2158	0	443.79	195.1	
	AVG 140.81	AVG 34.00	AVG 105.38	AVG 25.04	AVG 0.035	AVG 10.06	AVG 92.86	AVG 2.29	AVG 7.66	AVG 92.73	AVG 1.55	GEM 2	AVG 14.32	MIN 5.86	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 174.56	MAX 37.27	MA 156.00	MAX 28.81	MAX 0.057	AVW 18.20		AVW 3.23	AVW 20.75		AVW 3.69	GMF 14	MAX 16.84	MA 6.62	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	2	1	1	14	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.30103	0	0	1.14612804	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.30103	0	0	1.14612804	#DIV/0!
Week Avg:	**2**	**1**	**1**	**14**	**#DIV/0!**

Month Avg (log) 0.36178951

Month Avg:	**2**
HIGHEST WEEKLY	**14**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** June **Year** 2015

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0195								15.68	6.15	
2					0.0189							<1	15.56	6.19	
3	268.73	40.57	239.67	36.18	0.0181	19.5	93	2.9	19.75	92	3.0		15.51	6.28	
4					0.0198								18.37	6.36	
5					0.0292								16.68	6.46	
6					0.0262								17.27	6.63	
7					0.0189								17.46	6.49	
8					0.0218								17.51	6.41	
9					0.0189							E2	17.51	6.54	
10	211.21	31.71	240.34	36.08	0.018	10.17	95	1.5	7	97	1.1		17.37	6.65	
11					0.0172								17.46	6.54	
12					0.0302								17.80	6.42	
13					0.0176								17.46	6.39	
14					0.0202								17.32	6.43	
15					0.018								17.51	6.38	
16					0.0162							E12	17.39	6.40	
17	137.57	17.67	103.34	13.27	0.0154	3.9	97	0.5	5.55	95	0.7		17.65	6.48	
18					0.0162								16.96	6.48	
19					0.0293								17.39	6.48	
20					0.0164								17.42	6.49	
21					0.0172								17.82	6.52	
22					0.0162								17.82	6.56	
23					0.0169							E2	17.89	6.49	
24	220.98	34.10	225	34.72	0.0185	13.66	94	2.1	9	96	1.4		17.20	6.57	
25					0.0173								18.53	6.53	
26					0.018								18.68	6.64	
27					0.036								19.67	6.61	
28					0.0205								18.37	6.51	
29					0.0164								19.25	6.59	
30					0.0196							<1	19.48	6.64	
31															
Total	838.49	124.04	808.35	120.247	0.6026	47.23	378.91	7.0788	41.3	379.476	6.1336	0	527.99	194.3	
	AVG 209.62	AVG 31.01	AVG 202.09	AVG 30.06	AVG 0.020	AVG 11.81	AVG 94.37	AVG 1.77	AVG 10.33	AVG 94.89	AVG 1.53	GEM 2	AVG 17.60	MIN 6.15	
Permit		135		171	0.145	30	85	20	30	85	26	200		6	
	MAX 268.73	MAX 40.57	MAX 240.34	MAX 36.18	MAX 0.036	AVW 19.50		AVW 2.94	AVW 19.75		AVW 2.98	GMT 12	MAX 19.67	MAX 6.65	
Limits						45		30	45		39	400		9	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	2	12	2	1
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

1

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.30103	1.07918125	0.30103	0
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.30103	1.07918125	0.30103	0
Week Avg:		2	12	2	1

Month Avg (log) 0.33624825

Month Avg:	2
HIGHEST WEEKLY	12

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month July | Year 2015

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1	204.05	36.42	185.34	33.08	0.0214	12.13	94	2.2	7.95	96	1.4		19.34	6.59	
2					0.0267								19.44	6.48	
3					0.036								19.47	6.61	
4					0.0359								19.44	6.31	
5					0.0431								18.87	6.26	
6					0.0297								18.94	6.31	
7					0.0306							E17	19.01	6.22	
8	307.1	81.19	296	78.26	0.0317	16.5	95	4.4	12.39	96	3.3		18.79	6.18	
9					0.0308								19.01	6.21	
10					0.031								18.58	6.29	
11					0.0481								18.58	6.47	
12					0.0435								18.68	6.42	
13					0.0322								19.70	6.42	
14					0.0263							E16	19.77	6.35	
15	739	154.08	964	200.99	0.025	25.01	97	5.2	20.06	98	4.2		18.94	6.31	
16					0.0231								19.60	6.30	
17					0.0253								19.60	6.38	
18					0.0403								20.13	6.53	
19					0.0264								20.46	6.37	
20					0.0268								20.15	6.31	
21					0.0232							254	19.60	6.31	
22	289.96	58.28	224.67	45.16	0.0241	16.3	94	3.3	15.89	93	3.2		19.25	6.30	
23					0.0336								19.51	6.31	
24					0.0248								18.91	6.30	
25					0.04								18.94	6.53	
26					0.0318								18.65	6.47	
27					0.0355								19.37	6.50	
28					0.0311							E34	19.72	6.23	
29	266.07	63.69	200.67	48.03	0.0287	16.72	94	4.0	12.72	94	3.0		19.58	6.15	
30					0.0282								19.77	6.26	
31					0.028								19.44	6.32	
Total	1806.18	393.6562	1870.68	405.518	0.9629	86.66	473.393	19.02	69.01	476.033	15.115	254	599.24	197	
	AVG 361.24	AVG 78.73	AVE 374.14	AVE 81.10	AVG 0.031	AVG 17.33	AVG 95.20	AVG 3.80	AVG 13.80	AVG 96.31	AVG 3.02	GEM 39	AVG 19.33	MIN 6.15	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 739.00	MAX 154.08	MA 964.00	MA 200.99	MAX 0.048	AVW 25.01		AVG 5.21	AVG 20.06		AVG 4.18	GMT 254	MAX 20.46	MA 6.61	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	17	16	254	34	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.23044892	1.20411998	2.40483372	1.53147892	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.23044892	1.20411998	2.40483372	1.53147892	#DIV/0!

Week Avg:	**17**	**16**	**254**	**34**	**#DIV/0!**

Month Avg (log) 1.59272038

Month Avg:	**39**
HIGHEST WEEKLY	**254**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month August | Year 2015

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0457								19.53	6.48	
2					0.0324								19.70	6.34	
3					0.0251								19.70	6.39	
4					0.0276							E5	19.65	6.35	
5	388.7	85.26	294	64.49	0.0263	17.67	95	3.9	13	96	2.9		18.96	6.29	
6					0.0295								19.79	6.30	
7					0.0271								19.56	6.28	
8					0.0415								19.03	6.38	
9					0.0306								19.84	6.45	
10					0.0254								20.31	6.43	
11					0.0248								20.22	6.38	
12	363.7	83.72	285.67	65.76	0.0276	17.25	95	4.0	14.61	95	3.4	E4	19.98	6.34	
13					0.0276								20.08	6.31	
14					0.0296								19.48	6.30	
15					0.0277								19.46	6.28	
16					0.0527								19.87	6.45	
17					0.0223								19.77	6.38	
18					0.0209							E7	20.03	6.39	
19	429.7	80.27	382	71.36	0.0224	15.95	96	3.0	13.22	97	2.5		19.89	6.26	
20					0.0227								19.82	6.31	
21					0.0215								19.56	6.32	
22					0.0391								19.56	6.50	
23					0.0278								19.15	6.32	
24					0.0246								18.84	6.41	
25					0.0234							E8	19.06	6.42	
26	413.4	70.33	340	57.85	0.0204	13.78	97	2.3	7.17	98	1.2		18.70	6.39	
27					0.0212								18.79	6.35	
28					0.0448								19.34	6.31	
29					0.0277								18.84	6.36	
30					0.0445								18.72	6.33	
31					0.0409								18.56	6.26	
Total	1595.5	319.5852	1301.67	259.453	0.9254	64.65	383.666	13.171	48	384.894	9.904	0	603.79	197.06	
	AVG 398.88	AVG 79.90	AVE 325.42	AVG 64.86	AVG 0.030	AVG 16.16	AVG 95.95	AVG 3.29	AVG 12.00	AVG 96.31	AVG 2.48	GEM 6	AVG 19.48	MIN 6.26	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 429.70	MAX 85.26	MA 382.00	MAX 71.36	MAX 0.053	AVW 17.67		AVW 3.97	AVW 14.61		AVG 3.36	GMM 8	MAX 20.31	MA 6.50	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW**=Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMM=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisionment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	5	4	7	8	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.69897	0.60205999	0.84509804	0.90308999	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.69897	0.60205999	0.84509804	0.90308999	#DIV/0!

Week Avg:	**5**	**4**	**7**	**8**	**#DIV/0!**

Month Avg (log) 0.76230451

Month Avg:	**6**
HIGHEST WEEKLY	8

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 — Month September — Year 2015

Facility Nam Sekiu POTW — County Clallam

Receiving Water Strait of Juan de Fuca — Plant Operator Kim Malakoff

Plant Typ RBC — Population 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0664							1334	18.13	6.31	
2	141.09	57.07	184	74.43	0.0485	11.67	92	4.7	6.56	96	2.7	E40	19.58	6.18	
3					0.045							E7	17.51	6.41	
4					0.06							E3	17.49	6.40	
5					0.0571								17.01	6.49	
6					0.0755								17.30	6.47	
7					0.0596								17.32	6.35	
8					0.0512							38	17.63	6.22	
9	280.39	99.38	267	94.64	0.0425	12.03	96	4.3	6.56	98	2.3		17.89	6.21	
10					0.0469								18.27	6.20	
11					0.0361								18.13	6.17	
12					0.0553								18.01	6.35	
13					0.0381								17.63	6.41	
14					0.0404								17.30	6.56	
15					0.0695							E40	17.08	6.60	
16	204.95	66.15	139.34	44.97	0.0387	16.5	92	5.3	7.56	95	2.4		16.94	6.36	
17					0.0419								16.82	6.13	
18					0.0423								16.82	6.21	
19					0.06								17.32	6.38	
20					0.0654								17.53	6.40	
21					0.0884								17.18	6.55	
22					0.0579							E24	16.75	6.47	
23	236.46	100.97	178.67	76.29	0.0512	16.2	93	6.9	7.56	96	3.2		16.39	6.41	
24					0.0601								16.42	6.29	
25					0.0752								16.58	6.11	
26					0.0815								16.32	6.28	
27					0.0593								15.94	6.43	
28					0.0476								15.77	6.41	
29					0.0454							E6	15.80	6.39	
30	220.67	68.65	170.34	52.99	0.0373	14.51	93	4.5	8.67	95	2.7		15.39	6.14	
31															
Total	1083.56	392.22	939.35	343.321	1.6443	70.91	465.96	25.741	36.91	479.231	13.344	1372	514.25	190.3	
	AVG 216.71	AVG 78.44	AVE 187.87	AVG 68.66	AVG 0.055	AVG 14.18	AVG 93.46	AVG 5.15	AVG 7.38	AVG 96.07	AVG 2.67	GEM 27	AVG 17.14	MIN 6.11	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 280.39	MAX 100.97	MA 267.00	MAX 94.64	MAX 0.088	AVW 16.50		AVW 6.92	AVW 8.67		AVW 3.23	GMF 40	MAX 18.27	MA 6.60	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=Highest 7-day Geometric Mean

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Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1334	38	40	24	6
Day 4 (CFU/100 mL)	40				
Day 5 (CFU/100 mL)	7				
Day 6 (CFU/100 mL)	3				
Day 7 (CFU/100 mL)					

6

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	3.12515583	1.5797836	1.60205999	1.38021124	0.77815125
Day 4 (log)	1.60205999				
Day 5 (log)	0.84509804				
Day 6 (log)	0.47712125				
Day 7 (log)					
Week Avg (log)	1.51235878	1.5797836	1.60205999	1.38021124	0.77815125
Week Avg:	**33**	**38**	**40**	**24**	**6**

Month Avg (log) 1.42370515

Month Avg:	**27**
HIGHEST WEEKLY	**40**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

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WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** October **Year** 2015

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0454								16.12	6.50	
2					0.033								15.34	6.50	
3					0.0465								15.37	6.58	
4					0.0322								15.18	6.38	
5					0.0298								15.03	6.42	
6					0.0276							<1	15.01	6.38	
7	383	79.22	548	113.34	0.0248	11.97	97	2.5	10.33	98	2.1		15.13	6.42	
8					0.0559								15.37	6.41	
9					0.0377								15.80	6.56	
10					0.0542								15.82	6.57	
11					0.1616								15.27	6.54	
12					0.0879								15.03	6.53	
13					0.0867							E2	14.79	6.55	
14	61.33	32.68	56.17	29.93	0.0639	7.6	88	4.1	5.89	90	3.1		14.63	6.53	
15					0.0548								14.36	6.64	
16					0.0606								14.39	6.59	
17					0.0474								14.58	6.67	
18					0.0478								14.79	6.65	
19					0.0342								14.96	6.57	
20					0.0369							E4	14.82	6.53	
21	128.57	35.49	108.14	29.85	0.0331	8	94	2.2	6.28	94	1.7		14.67	6.63	
22					0.0315								14.36	6.52	
23					0.0323								13.93	6.57	
24					0.0319								13.64	6.55	
25					0.0489								13.64	6.73	
26					0.0341								13.95	6.73	
27					0.0367							E3	13.9	6.72	
28	104.79	31.2	115.33	34.34	0.0357	8.92	91	2.7	9.86	91	2.9		13.88	6.82	
29					0.0977								14.03	6.61	
30					0.1081								14.00	6.70	
31					0.2762								14.03	6.69	
Total	677.69	178.59	827.64	207.469	1.8351	36.49	369.75	11.39	32.36	373.272	9.9448	0	455.82	203.8	
	AVG 169.42	AVG 44.65	AVG 206.91	AVG 51.87	AVG 0.059	AVG 9.12	AVG 94.62	AVG 2.85	AVG 8.09	AVG 96.09	AVG 2.49	GEM 2	AVG 14.70	MIN 6.38	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 383.00	MAX 79.22	MAX 548.00	MAX 113	MAX 0.276	AVW 11.97		AVW 4.05	AVW 10.33		AVW 3.14	GM 4	MAX 15.82	MAX 6.82	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM=highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	2	4	3	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.30103	0.60205999	0.47712125	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.30103	0.60205999	0.47712125	#DIV/0!

Week Avg:		2	4	3	#DIV/0!

Month Avg (log) 0.34505281

Month Avg:	2
HIGHEST WEEKLY	4

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** November **Year** 2015

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequen	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	PH STANDARD UNITS
1					0.2899								13.59	6.89
2					0.1734								13.31	6.83
3					0.1031							<1	13.09	6.86
4	36.75	21.61	38.17	22.44	0.0705	5.98	84	3.5	5.31	86	3.1		12.32	6.48
5					0.0602								12.87	6.84
6					0.0489								12.80	6.82
7					0.1173								12.99	6.77
8					0.2195								12.90	7.12
9					0.1153								12.70	6.92
10					0.0887							128	12.44	7.10
11	26.04	21.65	28.52	23.71	0.0997	5.35	79	4.4	5.89	79	4.9		12.27	6.89
12					0.0937								12.17	7.05
13					0.3638								12.44	6.71
14					0.3283								12.32	7.16
15					0.1378								12.17	7.19
16					0.0946								11.78	6.91
17					0.1882							E140	12.10	6.93
18	16.8	62.41	28	104.01	0.4454	3.15	81	11.7	3.28	88	12.2		11.71	6.84
19					0.1746								11.66	7.13
20					0.0973								11.22	7.05
21					0.0725								11.03	7.14
22					0.0741								10.83	7.15
23					0.047								10.98	7.15
24					0.0553							E2	10.96	7.21
25	41.16	17.20	34.34	14.35	0.0501	5.29	87	2.2	4.28	88	1.8		10.54	7.04
26					0.0433								9.95	6.99
27					0.0381								9.76	7.12
28					0.0413								9.61	7.00
29					0.0435								9.39	7.04
30					0.0331								9.16	7.01
31														
Total	120.75	122.86	129.03	164.515	3.8085	19.77	331.58	21.876	18.76	341.258	21.992	128	351.06	209.34
	AVG 30.19	AVG 30.72	AVE 32.26	AV 41.13	AVG 0.127	AVG 4.94	AVG 83.63	AVG 5.47	AVG 4.69	AVG 85.46	AVG 5.50	GEM 14	AVG 11.70	MIN 6.48
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 41.16	MAX 62.41	MA 38.17	MA 104.01	MAX 0.445	AVG 5.98		AVW 11.70	AVW 5.89		AVW 12.18	GMI 140	MAX 13.09	MIN 7.21
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMI =Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	128	140	2	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	2.10720997	2.14612804	0.30103	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	2.10720997	2.14612804	0.30103	#DIV/0!
Week Avg:		**128**	**140**	**2**	**#DIV/0!**

Month Avg (log) 1.138592

Month Avg:	**14**
HIGHEST WEEKLY	**140**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month December | Year 2015

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0353							E2	9.9	7.01	
2	77.65	53.69	64.34	44.48	0.0829	8.39	89	5.8	6.45	90	4.5		10.42	6.87	
3					0.186								10.57	6.88	
4					0.2451								13.45	7.12	
5					0.1452								10.64	7.09	
6					0.1893								10.68	7.11	
7					0.2615								10.81	6.98	
8					0.2373							E260	10.98	7.10	
9	12.18	44.95	16	59.05	0.4425	5.31	56	19.6	7.86	51	29.0		10.86	6.93	
10					0.2531								10.69	7.16	
11					0.2233								10.59	7.09	
12					0.1489								10.47	7.17	
13					0.2641								10.35	7.11	
14					0.1659								10.32	7.13	
15					0.0968							<1	10.05	7.14	
16	31.77	19.607	30.84	19.03	0.074	4.01	87	2.5	4.44	86	2.7		10.03	7.11	
17					0.061								9.71	7.08	
18					0.1279								9.81	7.04	
19					0.1338								9.76	7.19	
20					0.201								9.78	6.99	
21					0.1587								9.66	7.15	
22					0.1356							E2	9.66	7.16	
23	18.42	20.54	15.5	17.28	0.1337	3.44	81	3.8	3.67	76	4.1		9.51	7.16	
24					0.2134								9.41	7.02	
25					0.1328								9.36	7.05	
26					0.0886								9.16	7.04	
27					0.0782								9.09	6.96	
28					0.1133								9.11	6.98	
29					0.0767							E3	9.04	7.04	
30	30.24	15.81	29.75	15.56	0.0627	4.46	85	2.3	4.06	86	2.1		8.82	7.04	
31					0.0581								8.39	6.96	
Total	170.26	154.6	156.43	155.404	4.8267	25.61	399.553	34.0398	26.48	389.129	42.4219	0	8.15	218.86	
	AVG 34.05	AVG 30.92	AVG 31.29	AVG 31.08	AVG 0.156	AVG 5.12	AVG 84.96	AVG 6.81	AVG 5.30	AVG 83.07	AVG 8.48	GEM 5	10.03	MIN 6.87	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 31.77	MAX 44.95	MA 30.84	MAX 59.05	MAX 0.443	AVW 8.39		AVW 19.60	AVW 7.86		AVG 29.01	GMF 260	13.45	MA 7.19	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

8

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	2	260	1	2	3
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

3

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.30103	2.41497335	0	0.30103	0.47712125
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.30103	2.41497335	0	0.30103	0.47712125
Week Avg:	**2**	**260**	**1**	**2**	**3**

Month Avg (log) 0.69883092

Month Avg:	**5**
HIGHEST WEEKLY	**260**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** January **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequen	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0583								8.15	6.87	
2					0.0508								8.15	6.86	
3					0.0498								8.17	6.81	
4					0.045								8.22	6.84	
5					0.0463							E33	8.34	6.81	
6	66.29	27.26	64.84	26.66	0.0493	4.95	93	2.0	4.28	93	1.8		8.53	6.81	
7					0.049								8.57	6.73	
8					0.0356								8.62	6.70	
9					0.0361								8.64	6.63	
10					0.0518								8.49	6.83	
11					0.0343								8.47	6.85	
12					0.0679							66	8.74	6.83	
13	29.16	55.89	27.5	52.70	0.2298	7.91	73	15.2	5.47	80	10.5		8.87	6.79	
14					0.1352								8.84	7.08	
15					0.0802								8.72	7.03	
16					0.1091								8.94	6.96	
17					0.254								9.04	7.04	
18					0.1718								9.11	7.06	
19					0.127							E4	9.04	7.04	
20	26.7	20.22	28.09	21.27	0.0908	3.5	87	2.7	1.26	96	1.0		8.99	6.99	
21					0.2275								8.99	6.64	
22					0.4615								9.14	6.75	
23					0.2512								9.29	7.03	
24					0.1218								9.26	7.04	
25					0.0715								9.13	6.92	
26					0.0717							E2	9.26	6.97	
27	43.54	50.07	53.17	61.15	0.1379	5.38	88	6.2	4.97	91	5.7		9.68	6.90	
28					0.3067								9.76	6.81	
29					0.2099								9.49	7.09	
30					0.1704								9.19	7.05	
31					0.1169								9.11	7.08	
Total	165.69	153.44	173.6	161.786	3.9191	21.74	339.942	26.0329	15.98	359.675	18.9133	66	274.94	213.84	
	AVG 41.42	AVG 38.36	AVG 43.40	AVG 40.45	AVG 0.126	AVG 5.44	AVG 86.88	AVG 6.51	AVG 4.00	AVG 90.79	AVG 4.73	GEM 11	AVG 8.87	MIN 6.63	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 66.29	MAX 55.89	MA 64.84	MAX 61.15	MAX 0.462	AVW 7.91		AVW 15.16	AVW 5.47		AVW 10.48	GMT 66	MAX 9.76	MA 7.09	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisionment for knowing violations.

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	33	66	4	2	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.51851394	1.81954394	0.60205999	0.30103	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.51851394	1.81954394	0.60205999	0.30103	#DIV/0!
Week Avg:	**33**	**66**	**4**	**2**	**#DIV/0!**

Month Avg (log) 1.06028697

Month Avg:	**11**
HIGHEST WEEKLY	**66**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** February **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1					0.0748								9.02	6.98
2					0.0646							<1	8.84	6.99
3	31.2	14.91	38	18.16	0.0573	3.83	88	1.8	7	82	3.3		8.92	6.96
4					0.1547								8.92	6.99
5					0.1038								9.08	7.05
6					0.1599								9.04	7.10
7					0.1277								9.11	7.12
8					0.0792								9.06	7.04
9					0.0658							<1	9.31	7.02
10	36	16.84	39.75	18.60	0.0561	4.13	89	1.9	4.86	88	2.3		9.41	6.95
11					0.0614								9.39	6.89
12					0.1697								9.41	6.89
13					0.1444								9.41	7.03
14					0.2017								9.61	7.05
15					0.1693								9.61	6.89
16					0.4383							E17	9.44	6.82
17	20.4	31.41	23.34	35.93	0.1846	3.72	82	5.7	3.72	84	5.7		9.53	7.06
18					0.1349								9.61	7.08
19					0.0969								9.58	7.05
20					0.1119								9.44	7.05
21					0.0585								9.26	7.02
22					0.0782								9.26	7.08
23					0.0712							E8	9.06	6.97
24	37.82	17.10	39.05	17.65	0.0542	3.08	92	1.4	3.84	90	1.7		9.34	7.02
25					0.0579								9.46	6.97
26					0.0527								9.51	6.91
27					0.0559								9.81	6.86
28					0.0529								9.62	6.79
29					0.0799								9.56	6.85
30														
31														
Total	125.42	80.256	140.14	90.3426	3.2184	14.76	349.87	10.882	19.42	343.581	13.082	0	270.62	202.5
	AVG 31.36	AVG 20.06	AVG 35.04	AVG 22.59	AVG 0.111	AVG 3.69	AVG 88.23	AVG 2.72	AVG 4.86	AVG 86.14	AVG 3.27	GEM 3	AVG 9.33	MIN 6.79
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 37.82	MAX 31.41	MAX 39.75	MAX 35.93	MAX 0.438	AVW 4.13		AVW 5.73	AVW 7.00		AVW 5.73	GMT 17	MAX 9.81	MAX 7.12
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	1	17	8	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0	1.23044892	0.90308999	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0	1.23044892	0.90308999	#DIV/0!
Week Avg:		**1**	**17**	**8**	**#DIV/0!**

Month Avg (log) 0.53338473

Month Avg:	**3**
HIGHEST WEEKLY	**17**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month March | Year 2016

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0996							E400	9.49	6.67	
2	16.44	60.27	31	113.65	0.4396	6.43	61	23.6	10.41	66	38.2	E9	9.42	6.94	
3					0.2415								9.53	7.03	
4					0.1642								9.61	7.06	
5					0.2102								9.88	7.01	
6					0.1785								9.73	7.12	
7					0.1412								9.71	7.07	
8					0.112							E5	9.51	7.08	
9	26.73	18.79	28.34	19.92	0.0843	3.43	87	2.4	3.28	88	2.3		9.46	7.04	
10					0.3794								9.46	6.56	
11					0.388								9.46	7.07	
12					0.1676								9.44	7.15	
13					0.128								9.34	7.14	
14					0.1587								9.16	7.05	
15					0.1695							E16	9.21	7.05	
16	13.5	15.121	15	16.80	0.1343	3.55	74	4.0	2.42	84	2.7		9.31	7.16	
17					0.0912								9.24	7.09	
18					0.0628								9.34	7.03	
19					0.065								9.56	6.92	
20					0.0506								9.76	6.83	
21					0.0568								9.83	6.70	
22					0.0686							<1	9.93	6.88	
23	46.36	23.16	56.25	28.10	0.0599	3.54	92	1.8	2.89	95	1.4		9.85	6.85	
24					0.0959								9.76	7.03	
25					0.1105								10.00	7.09	
26					0.0935								10.12	7.03	
27					0.0715								10.25	7.00	
28					0.0682								10.27	6.97	
29					0.0517							E33	10.05	6.93	
30	32.4	12.67	47	18.38	0.0469	0.826	97	0.3	1.5	97	0.6		10.49	6.47	
31					0.0464								10.69	6.86	
Total	135.43	130.02	177.59	196.8643	4.2361	17.776	411.57	32.053	20.5	430.383	45.2129	0	300.86	215.9	
	AVG 27.09	AVG 26.00	AVE 35.52	AVG 39.37	AVG 0.137	AVG 3.56	AVG 86.87	AVG 6.41	AVG 4.10	AVG 88.46	AVG 9.04	GEM 15	AVG 9.71	MIN 6.47	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 46.36	MAX 23.16	MA 56.25	MAX 113.65	MAX 0.388	AVW 6.43		AVW 23.57	AVW 10.41		AVW 38.17	GMT 60	MAX 10.69	MA 7.16	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	400	5	16	1	33
Day 4 (CFU/100 mL)	9				
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					33
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	2.60205999	0.69897	1.20411998	0	1.51851394
Day 4 (log)	0.95424251				
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.77815125	0.69897	1.20411998	0	1.51851394
Week Avg:	**60**	**5**	**16**	**1**	**33**

Month Avg (log)	1.1629844
Month Avg:	**15**
HIGHEST WEEKLY	**60**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month April | Year 2016

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1					0.0428								10.30	6.91
2					0.0495								10.71	6.82
3					0.0413								11.03	6.86
4					0.041								10.86	6.71
5					0.0504							<1	10.91	6.87
6	91.95	33.28	82.5	29.86	0.0434	4.12	96	1.5	3.89	95	1.4		11.18	6.63
7					0.0461								11.95	6.72
8					0.038								12.00	6.80
9					0.0511								11.95	6.70
10					0.0362								11.35	6.74
11					0.0375								11.30	6.60
12					0.0375							E3	11.27	6.57
13	98.57	35.60	106.5	38.46	0.0433	4.1	96	1.5	2.44	98	0.9		11.03	6.60
14					0.0398								11.83	6.71
15					0.036								11.44	6.22
16					0.0457								11.69	6.59
17					0.0403								12.22	6.38
18					0.0378								12.94	6.58
19					0.035							<1	13.43	6.45
20	115.8	21.92	108.67	20.57	0.0227	4.06	96	0.8	2.83	97	0.5		14.31	6.45
21					0.0229								13.76	6.39
22					0.0342								13.08	6.47
23					0.0411								12.99	6.53
24					0.0453								13.11	6.13
25					0.0315								12.87	6.08
26					0.0306							<1	12.44	6.38
27	170.88	37.48	146	32.02	0.0263	5.29	97	1.2	3.92	97	0.9		12.85	6.62
28					0.0304								12.32	6.95
29					0.0247								13.23	6.80
30					0.0345								13.50	6.67
31														
Total	477.2	128.28	443.67	120.92	1.1369	17.57	384.76	4.901	13.08	387.7	3.685	0	363.85	197.9
	AVG 119.30	AVG 32.07	AVE 110.92	AVG 30.23	AVG 0.038	AVG 4.39	AVG 96.32	AVG 1.23	AVG 3.27	AVG 97.05	AVG 0.92	GEM 1	AVG 12.13	MIN 6.08
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 170.88	MAX 37.48	MAX 146.00	MAX 38.46	MAX 0.051	AVW 5.29		AVW 1.49	AVW 3.92		AVW 1.41	GMT 3	MAX 14.31	MAX 6.95
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	3	1	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.47712125	0	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.47712125	0	0	#DIV/0!
Week Avg:		**3**	**1**	**1**	**#DIV/0!**

Month Avg (log) 0.11928031

Month Avg:	**1**
HIGHEST WEEKLY	3

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month May | Year 2016

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT										
Frequen	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.024								13.81	6.60	
2					0.0235								14.22	6.52	
3					0.0256							<1	13.57	6.43	
4	135.6	33.81	130.67	32.58	0.0299	6.68	95	1.7	3.83	97	1.0		14.12	6.58	
5					0.0294								16.08	6.58	
6					0.0224								14.63	6.56	
7					0.0422								14.70	6.46	
8					0.0308								14.65	6.32	
9					0.0237								15.13	6.37	
10					0.0217							E2	15.32	6.31	
11	221.71	38.09	236.67	40.66	0.0206	7.6	97	1.3	15.5	93	2.7		15.27	6.16	
12					0.0257								15.20	6.28	
13					0.0321								15.92	6.10	
14					0.0412								14.86	6.37	
15					0.0349								14.72	6.23	
16					0.0281								14.84	6.24	
17					0.0197							E3	15.56	6.15	
18	179.57	25.31	198.34	27.96	0.0169	20.95	88	3.0	25	87	3.5		14.75	6.33	
19					0.0308								14.72	6.42	
20					0.0113								15.75	6.43	
21					0.0138								14.84	6.47	
22					0.0184								14.65	6.51	
23					0.0123								15.06	6.53	
24					0.0118							E4	15.03	6.39	
25	262.84	30.25	134	15.42	0.0138	9.6	96	1.1	6.61	95	0.8		14.98	6.56	
26					0.0193								14.51	6.65	
27					0.0272								14.60	6.26	
28					0.0414								15.39	6.51	
29					0.0354								15.72	6.56	
30					0.0263								16.23	6.70	
31					0.0244							<1	16.84	6.56	
Total	799.72	127.47	699.68	116.62	0.7786	44.83	376.33	7.029	50.94	372.98	7.902	0	465.67	199.1	
	AVG 199.93	AVG 31.87	AVG 174.92	AVG 29.16	AVG 0.025	AVG 11.21	AVG 94.39	AVG 1.76	AVG 12.74	AVG 92.72	AVG 1.98	GEM 2	AVG 15.02	MIN 6.10	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 262.84	MAX 38.09	MA 236.67	MAX 40.66	MAX 0.042	AVW 20.95		AVW 2.95	AVW 25.00		AVW 3.52	GMF 4	MAX 16.84	MA 6.70	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	2	3	4	1
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

					1
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.30103	0.47712125	0.60205999	0
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.30103	0.47712125	0.60205999	0
Week Avg:		**2**	**3**	**4**	**1**

Month Avg (log) 0.27604225

Month Avg:	**2**
HIGHEST WEEKLY	**4**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

JUNE

Permit No WA0024449 | Month July | Year 2016

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1	223.95	26.71	311.67	37.17	0.0143	15.45	93	1.8	20.61	93	2.5		16.18	6.43
2					0.0158								16.06	6.20
3					0.0161								17.27	6.14
4					0.0259								18.06	6.51
5					0.0182								18.15	6.55
6					0.0149								18.22	6.59
7					0.0132							<1	17.72	6.47
8	154.12	15.55	112	11.30	0.0121	14.61	91	1.5	10.33	91	1.0		17.01	6.53
9					0.0146								16.30	6.45
10					0.0169								15.94	6.47
11					0.0241								15.44	6.58
12					0.0358								16.11	6.58
13					0.0181								15.70	6.52
14					0.0169							E6	15.46	6.47
15	245.03	34.13	262.34	36.54	0.0167	9.53	96	1.3	5.78	98	0.8		15.08	6.59
16					0.0213								15.89	6.62
17					0.0174								15.61	6.57
18					0.0269								15.10	6.65
19					0.0179								16.42	6.69
20					0.0176								16.63	6.62
21					0.0194							E7	16.18	6.62
22	148.46	25.38	171	29.24	0.0205	8.59	94	1.5	6.69	96	1.1		15.99	6.68
23					0.0265								16.08	6.69
24					0.0255								15.84	6.64
25					0.039								16.75	6.66
26					0.0191								17.11	6.58
27					0.0178								17.68	6.53
28					0.0221							<1	17.89	6.40
29	276.34	56.23	299.67	60.98	0.0244	7.46	97	1.5	8	97	1.6		17.65	6.74
30					0.0266								17.08	6.65
31														
Total	1047.9	158.01	1156.68	175.23	0.6156	55.64	471.25	7.631	51.41	475.38	7.077	0	496.6	196.4
	AVG 209.58	AVG 31.60	AVG 231.34	AVG 35.05	AVG 0.021	AVG 11.13	AVG 94.69	AVG 1.53	AVG 10.28	AVG 95.56	AVG 1.42	GEM 3	AVG 16.55	MIN 6.14
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 276.34	MAX 56.23	MA 299.67	MAX 60.98	MAX 0.039	AVW 15.45		AVW 1.84	AVW 20.61		AVW 2.46	GMF 7	MAX 18.22	MA 6.74
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMF=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	6	7	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.77815125	0.84509804	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.77815125	0.84509804	0	#DIV/0!
Week Avg:		**6**	**7**	**1**	**#DIV/0!**

Month Avg (log) 0.40581232

Month Avg:	**3**
HIGHEST WEEKLY	7

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** July **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT					EFFLUENT										
Frequen	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	PH STANDARD UNITS	
1					0.0286								17.23	6.42	
2					0.0433								16.69	6.50	
3					0.0358								17.51	6.41	
4					0.0316								17.11	6.31	
5					0.0287							E3	16.89	6.30	
6	231.88	53.18	218.34	50.08	0.0275	15.76	93	3.6	13.72	94	3.1		17.94	6.19	
7					0.0257								17.13	6.37	
8					0.0291								17.53	6.25	
9					0.0431								17.15	6.47	
10					0.038								18.03	6.41	
11					0.0287								17.58	6.63	
12					0.0269							<1	17.42	6.30	
13	300.9	58.97	290	56.84	0.0235	17.48	94	3.4	20.39	93	4.0		18.22	6.33	
14					0.0234								18.46	6.40	
15					0.0222								18.70	6.43	
16					0.0313								18.27	6.61	
17					0.0337								18.84	6.49	
18					0.0182								18.56	6.39	
19					0.0187							E27	18.32	6.38	
20	287.19	47.42	249.67	41.23	0.0198	14.73	95	2.4	17	93	2.8		19.03	6.39	
21					0.0192								19.18	6.55	
22					0.0225								18.32	6.55	
23					0.0346								18.98	6.76	
24					0.0215								18.82	6.49	
25					0.02								19.48	6.44	
26					0.0172							<1	19.32	6.37	
27	292.17	44.84	297.34	45.63	0.0184	14.7	95	2.3	16.55	94	2.5		19.48	6.52	
28					0.0194								19.58	6.38	
29					0.0195								19.63	6.45	
30					0.0322								19.51	6.76	
31					0.0224								19.18	6.41	
Total	1112.14	204.41	1055.35	193.77	0.8247	62.67	377.23	11.729	67.66	374.31	12.49	0	568.09	199.7	
	AVG 278.04	AVG 51.10	AVG 263.84	AVG 48.44	AVG 0.027	AVG 15.67	AVG 94.36	AVG 2.93	AVG 16.92	AVG 93.59	AVG 3.12	GEM 3	AVG 18.33	MIN 6.19	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 300.90	MAX 58.97	MA 297.34	MAX 56.84	MAX 0.043	AVW 17.48		AVW 3.61	AVW 20.39		AVW 4.00	GMT 27	MAX 19.63	MAX 6.76	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	3	1	27	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.47712125	0	1.43136376	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.47712125	0	1.43136376	0	#DIV/0!
Week Avg:	**3**	**1**	**27**	**1**	**#DIV/0!**

Month Avg (log)	0.47712125
Month Avg:	**3**
HIGHEST WEEKLY	**27**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** August **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequen	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0173								19.03	6.50	
2					0.0195							E5	18.46	6.43	
3	378	58.95	311.34	48.56	0.0187	15.43	96	2.4	10.45	97	1.6		18.70	6.39	
4					0.0278								19.27	6.48	
5					0.0222								19.08	6.50	
6					0.0211								18.32	6.56	
7					0.0203								18.08	6.54	
8					0.0194								18.51	6.53	
9					0.0189							E4	18.18	6.55	
10	325.97	48.93	219	32.88	0.018	16.64	95	2.5	11.17	95	1.7		18.68	6.63	
11					0.0204								19.39	6.48	
12					0.0304								19.84	6.77	
13					0.02								19.60	6.60	
14					0.0252								19.39	6.62	
15					0.0223								19.34	6.52	
16					0.0256							E3	19.22	6.43	
17	179.15	28.09	176	27.60	0.0188	12.22	93	1.9	5.94	97	0.9		18.72	6.50	
18					0.0162								19.37	6.53	
19					0.0133								19.70	6.47	
20					0.0243								19.98	6.61	
21					0.0139								18.82	6.65	
22					0.0159								18.65	6.67	
23					0.0124							<1	18.58	6.59	
24	524.7	48.14	332	30.46	0.011	10.3	98	0.9	1.83	99	0.2		18.72	6.67	
25					0.0134								18.37	6.67	
26					0.0262								18.94	6.62	
27					0.0169								18.68	6.62	
28					0.0171								18.13	6.68	
29					0.0166								18.46	6.67	
30					0.0131							E2	18.27	6.69	
31	313.7	34.27	321.34	35.11	0.0131	9.75	97	1.1	5	98	0.5		18.03	6.69	
Total	1721.52	218.38	1359.68	174.593	0.5893	64.34	478.92	8.8306	34.39	486.061	4.9521	0	584.51	203.9	
	AVG 344.30	AVG 43.68	AVG 271.94	AVG 34.92	AVG 0.019	AVG 12.87	AVG 96.26	AVG 1.77	AVG 6.88	AVG 97.47	AVG 0.99	GEM 3	AVG 18.86	MIN 6.39	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 524.70	MAX 58.95	MAX 332.00	MAX 48.56	MAX 0.030	AVW 16.64		AVW 2.50	AVW 11.17		AVW 1.68	GMP 5	MAX 19.98	MA 6.77	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMP=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisionment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	5	4	3	1	2
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					2
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.69897	0.60205999	0.47712125	0	0.30103
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.69897	0.60205999	0.47712125	0	0.30103
Week Avg:	5	4	3	1	2

Month Avg (log) 0.41583625

Month Avg:	3
HIGHEST WEEKLY	5

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** September **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT					EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK		CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY		FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1						0.016								19.70	6.74	
2						0.0727								17.56	6.83	
3						0.0444								17.11	6.63	
4						0.0314								16.70	6.57	
5						0.0293								16.39	6.49	
6						0.0355							E1334	17.01	6.52	
7	145.85	35.64	109.34	26.72		0.0293	8.94	94	2.2	4.61	96	1.1	E4	16.65	6.45	
8						0.0344								17.25	6.46	
9						0.0223								16.87	6.52	
10						0.023								16.61	6.50	
11						0.0244								17.11	6.62	
12						0.0183								16.73	6.57	
13						0.0185							E3	16.51	6.62	
14	182.18	24.46	134.34	18.04		0.0161	7.59	96	1.0	5.44	96	0.7		16.39	6.51	
15						0.018								16.56	6.65	
16						0.0162								16.18	6.48	
17						0.0239								16.25	6.57	
18						0.0462								16.32	6.56	
19						0.0301								16.32	6.48	
20						0.0404							<1	15.99	6.46	
21	95.87	27.82	96	27.86		0.0348	11.93	88	3.5	5.17	95	1.5		15.68	6.49	
22						0.0344								15.29	6.65	
23						0.0314									6.47	
24						0.0653									6.65	
25						0.0339									6.40	
26						0.0314									6.49	
27						0.0253							E2		6.47	
28	202.47	41.88	228	47.16		0.0248	6.3	97	1.3	3.83	98	0.8			6.43	
29						0.025									6.47	
30						0.025									6.45	
31																
Total	626.37	129.8	567.68	119.777		0.9217	34.76	374.15	7.9692	19.05	384.669	4.1496	0	367.18	196.2	
	AVG 156.59	AVG 32.45	AVG 141.92	AVG 29.94		AVG 0.031	AVG 8.69	AVG 94.45	AVG 1.99	AVG 4.76	AVG 96.64	AVG 1.04	GEM 8	AVG 16.69	MIN 6.40	
Permit		**135**		**171**		**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 202.47	MAX 41.88	MA 228.00	MAX 47.16		MAX 0.065	AVW 11.93		AVW 3.46	AVW 5.44		AVW 1.50	GMT 73	MAX 17.25	MA 6.65	
Limits							**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1334	3	1	2	
Day 4 (CFU/100 mL)	4				
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	3.12515583	0.47712125	0	0.30103	
Day 4 (log)	0.60205999				
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.86360791	0.47712125	0	0.30103	#DIV/0!
Week Avg:	**73**	**3**	**1**	**2**	**#DIV/0!**

Month Avg (log) 0.90107341

Month Avg:	**8**
HIGHEST WEEKLY	**73**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** October **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0313									6.62	
2					0.028									6.66	
3					0.0238									6.65	
4					0.0233							<1		6.59	
5	185.51	71.01	198	75.80	0.0459	7.67	96	2.9	7.78	96	3.0			6.74	
6					0.0428								14.60	6.72	
7					0.0914								14.54	6.81	
8					0.0958								14.60	6.92	
9					0.2658								14.24	6.92	
10					0.0802								13.98	9.79	
11					0.0584							64	13.59	6.84	
12	60.3	23.13	81	31.07	0.046	8	87	3.1	3.72	95	1.4		13.23	6.88	
13					0.1308								13.50	6.67	
14					0.3298								13.26	6.66	
15					0.413								12.99	6.86	
16					0.3442								13.11	6.93	
17					0.2363								13.16	6.86	
18					0.1611							E8	13.28	6.90	
19	43.8	39.67	35.5	32.15	0.1086	4.67	89	4.2	4.91	86	4.4		13.16	6.94	
20					0.1594								13.04	6.86	
21					0.1846								12.92	6.95	
22					0.1583								12.82	6.92	
23					0.1048								13.04	6.98	
24					0.0821								12.99	6.99	
25					0.0763							E23	12.99	6.94	
26	50.4	47.67	40.67	38.46	0.1134	5.65	89	5.3	5.19	87	4.9		12.90	6.97	
27					0.1984								12.82	6.99	
28					0.2134								12.78	7.05	
29					0.1137								12.80	7.05	
30					0.0969								12.65	6.98	
31					0.0839								12.73	6.95	
Total	340.01	181.48	355.17	177.488	4.1417	25.99	360.73	15.578	21.6	364.886	13.761	64	345.72	215.6	
	AVG 85.00	AVG 45.37	AVG 88.79	AVG 44.37	AVG 0.134	AVG 6.50	AVG 92.36	AVG 3.89	AVG 5.40	AVG 93.92	AVG 3.44	GEM 10	AVG 13.30	MIN 6.59	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 185.51	MAX 71.01	MA 198.00	MAX 75.80	MAX 0.413	AVG 8.00		AVG 5.34	AVG 7.78		AVG 4.91	GMT 64	MAX 14.60	MA 9.79	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** October **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT					EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	PH STANDARD UNITS	
1					0.0313									6.62	
2					0.028									6.66	
3					0.0238									6.65	
4					0.0233							<1		6.59	
5	185.51	71.01	198	75.80	0.0459	7.67	96	2.9	7.78	96	3.0			6.74	
6					0.0428								14.60	6.72	
7					0.0914								14.54	6.81	
8					0.0958								14.60	6.92	
9					0.2658								14.24	6.92	
10					0.0802								13.98	9.79	
11					0.0584							64	13.59	6.84	
12	60.3	23.13	81	31.07	0.046	8	87	3.1	3.72	95	1.4		13.23	6.88	
13					0.1308								13.50	6.67	
14					0.3298								13.26	6.66	
15					0.413								12.99	6.86	
16					0.3442								13.11	6.93	
17					0.2363								13.16	6.86	
18					0.1611							E8	13.28	6.90	
19	43.8	39.67	35.5	32.15	0.1086	4.67	89	4.2	4.91	86	4.4		13.16	6.94	
20					0.1594								13.04	6.86	
21					0.1846								12.92	6.95	
22					0.1583								12.82	6.92	
23					0.1048								13.04	6.98	
24					0.0821								12.99	6.99	
25					0.0763							E23	12.99	6.94	
26	50.4	47.67	40.67	38.46	0.1134	5.65	89	5.3	5.19	87	4.9		12.90	6.97	
27					0.1984								12.82	6.99	
28					0.2134								12.78	7.05	
29					0.1137								12.80	7.05	
30					0.0969								12.65	6.98	
31					0.0839								12.73	6.95	
Total	340.01	181.48	355.17	177.488	4.1417	25.99	360.73	15.578	21.6	364.886	13.761	64	345.72	215.6	
	AVG 85.00	AVG 45.37	AVG 88.79	AVG 44.37	AVG 0.134	AVG 6.50	AVG 92.36	AVG 3.89	AVG 5.40	AVG 93.92	AVG 3.44	GEM 10	AVG 13.30	MIN 6.59	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 185.51	MAX 71.01	MA 198.00	MAX 75.80	MAX 0.413	AVG 8.00		AVG 5.34	AVW 7.78		AVG 4.91	GM 64	MAX 14.60	MA 9.79	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	64	8	23	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	1.80617997	0.90308999	1.36172784	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	1.80617997	0.90308999	1.36172784	#DIV/0!

Week Avg:		**64**	**8**	**23**	**#DIV/0!**

Month Avg (log) 1.01774945

Month Avg:	**10**
HIGHEST WEEKLY	**64**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** November **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1					0.099							E8	12.65	6.98
2	27.48	36.74	27.5	36.76	0.1603	5.01	82	6.7	4.69	83	6.3		12.42	6.91
3					0.3004								12.46	6.97
4					0.1293								12.53	7.05
5					0.1653								12.63	6.81
6					0.1521								12.58	7.07
7					0.0888								12.64	6.98
8					0.0755							E2	13.04	6.97
9	40.37	42.22	34.34	35.91	0.1254	4.55	89	4.8	2.84	92	3.0		13.02	6.74
10					0.1285								12.90	7.05
11					0.0172								12.87	6.95
12					0.0916								13.04	6.93
13					0.1075								12.90	7.02
14					0.12								12.58	7.02
15					0.0902							E6	12.44	7.02
16	35.93	23.67	37.67	24.82	0.079	4.63	87	3.1	3.61	90	2.4		12.24	7.02
17					0.0948								12.00	7.01
18					0.0702								11.83	6.99
19					0.0695								11.90	7.02
20					0.1023								12.05	6.96
21					0.1199								12.00	6.95
22					0.0888							E24	11.71	6.62
23	25.03	33.15	20	26.49	0.1588	3.92	84	5.2	2.17	89	2.9		11.44	7.05
24					0.1799								11.42	6.91
25					0.3425								11.18	7.04
26					0.2564								11.22	6.55
27					0.289								11.05	7.01
28					0.1323								11.01	6.91
29	22.06	16.23	19.25	14.16	0.0882	4.47	80	3.3	4.48	77	3.3	E4	11.08	6.92
30					0.0826								11.08	6.93
31														
Total	150.87	152.01	138.76	138.146	4.0053	22.58	421.69	22.987	17.79	430.969	17.788	0	363.91	208.4
	AVG 30.17	AVG 30.40	AVW 27.75	AVG 27.63	AVG 0.134	AVG 4.52	AVG 85.03	AVG 4.60	AVG 3.56	AVG 87.18	AVG 3.56	GEM 6	AVG 12.13	MIN 6.55
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 40.37	MAX 42.22	MA 37.67	MAX 36.76	MAX 0.343	AVG 5.01		AVG 6.70	AVG 4.69		AVG 6.27	GM 24	MAX 13.04	MAX 7.07
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	8	2	6	24	4
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

4

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.90308999	0.30103	0.77815125	1.38021124	0.60205999
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.90308999	0.30103	0.77815125	1.38021124	0.60205999
Week Avg:	**8**	**2**	**6**	**24**	**4**

Month Avg (log) 0.79290849

Month Avg:	**6**
HIGHEST WEEKLY	**24**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** December **Year** 2016

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequen	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1					0.0853								11.20	7.01
2					0.0767								11.60	7.01
3					0.1106								11.60	7.00
4					0.125								10.90	7.09
5					0.0906								10.20	7.01
6					0.0942							47	10.00	7.08
7	14.16	8.93	17	10.72	0.0756	4.07	71	2.6	3.95	77	2.5		9.30	6.96
8					0.0598								9.10	6.95
9					0.0488								8.70	6.97
10					0.1027								9.00	6.99
11					0.2294								9.10	6.99
12					0.173								9.40	7.00
13					0.129							24	9.60	7.04
14	20.82	13.42	22.75	14.67	0.0773	3.83	82	2.5	2.64	88	1.7		8.90	7.05
15					0.0608								9.70	7.02
16					0.0512								9.00	6.91
17					0.0458								8.40	6.89
18					0.0399								8.90	6.83
19					0.0927								8.90	6.84
20					0.1461							<1	9.20	6.97
21	15.29	13.52	10.5	9.28	0.106	3.75	75	3.3	3.37	68	3.0		9.20	7.07
22					0.0759								10.20	7.03
23					0.07								10.10	7.00
24					0.0681								9.70	6.98
25					0.0514								8.50	6.94
26					0.045								8.50	6.84
27					0.1086							E3	8.80	6.85
28	21.42	20.35	25.25	23.99	0.1139	3.56	83	3.4	3.97	84	3.8		8.40	7.05
29					0.0992								9.30	7.03
30					0.129								9.00	7.05
31					0.0787								8.40	7.04
Total	71.69	56.215	75.5	58.6531	2.8603	15.21	311.72	11.732	13.93	317.342	10.943	71	292.8	216.5
	AVG 17.92	AVG 14.05	AVG 18.88	AVG 14.66	AVG 0.092	AVG 3.80	AVG 78.78	AVG 2.93	AVG 3.48	AVG 81.55	AVG 2.74	GEM 8	AVG 9.45	MIN 6.83
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 21.42	MAX 20.35	MA 25.25	MAX 23.99	MAX 0.229	AVG 4.07		AVG 3.38	AVG 3.97		AVG 3.77	GMI 47	MAX 11.60	MA 7.09
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMI=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	47	24	1	3	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.67209786	1.38021124	0	0.47712125	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.67209786	1.38021124	0	0.47712125	#DIV/0!

Week Avg:	**47**	**24**	**1**	**3**	**#DIV/0!**

Month Avg (log) 0.88235759

Month Avg:	**8**
HIGHEST WEEKLY	**47**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** January **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	PH STANDARD UNITS	
1					0.062								8.40	6.99	
2					0.0481								7.50	6.92	
3					0.0447							<1	6.80	6.90	
4	38.92	18.60	35	16.73	0.0573	4.31	89	2.1	2.69	92	1.3		6.10	6.84	
5					0.0397								6.40	6.72	
6					0.0326								6.67	6.70	
7					0.0422								6.54	6.68	
8					0.0322								6.99	6.65	
9					0.063								7.19	6.59	
10					0.0578							E3	7.17	6.80	
11	37.23	13.69	40.5	14.90	0.0441	4.63	88	1.7	3.33	92	1.2		6.54	6.73	
12					0.0417								6.00	6.83	
13					0.0374								6.13	6.69	
14					0.0397								6.23	6.58	
15					0.0348								6.41	6.55	
16					0.031								6.89	6.52	
17					0.0373							10	7.75	6.48	
18	80.52	123.29	77.67	118.93	0.1836	6.74	92	10.3	6.83	91	10.5		7.97	6.57	
19					0.2914								7.97	6.92	
20					0.0975								7.87	6.93	
21					0.1116								8.00	6.97	
22					0.0556								7.97	6.84	
23					0.0593								7.92	6.82	
24					0.0495							E6	7.72	6.90	
25	52.32	20.64	56	22.09	0.0473	3.89	93	1.5	11.6	79	4.6		7.92	6.76	
26					0.0417								7.87	6.68	
27					0.0386								7.97	6.62	
28					0.0415								7.90	6.63	
29					0.034								8.05	6.58	
30					0.0343								8.02	6.58	
31					0.0358							<1	7.77	6.64	
Total	208.99	176.226	209.17	172.6427	1.8673	19.57	360.68	15.618	24.45	354.58	17.545	10	226.63	208.6	
	AVG 52.25	AVG 44.06	AVI 52.29	AVE 43.16	AVG 0.060	AVG 4.89	AVG 90.64	AVG 3.90	AVG 6.11	AVG 88.31	AVG 4.39	GEM 3	AVG 7.31	MIN 6.48	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 80.52	MAX 123.29	MA 77.67	MAX 118.93	MAX 0.291	AVW 6.74		AVW 10.32	AVW 11.60		AVW 10.46	GMT 10	MAX 8.05	MA 6.97	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	3	10	6	1
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

					1
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.47712125	1	0.77815125	0
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.47712125	1	0.77815125	0
Week Avg:		3	10	6	1

Month Avg (log) 0.4510545

Month Avg:	3
HIGHEST WEEKLY	10

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month February | Year 2017

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1	214.67	57.65	254	68.21	0.0322	3.98	98	1.1	3.56	99	1.0		6.80	6.78
2					0.0309								6.48	6.66
3					0.0333								6.31	6.62
4					0.1058								7.02	6.71
5					0.138								7.02	6.97
6					0.1								6.94	6.95
7					0.0864							5	6.86	7.02
8	17.49	10.44	19.34	11.55	0.0716	4.01	77	2.4	5	74	3.0		6.66	6.97
9					0.221								6.79	6.55
10					0.4098								7.07	6.91
11					0.1949								7.24	6.95
12					0.1033								7.22	6.91
13					0.017								7.12	6.83
14					0.0568							<1	7.32	6.83
15	51.54	42.25	40.34	33.07	0.0983	4.48	91	3.7	2.22	94	1.8		7.92	6.74
16					0.2101								7.92	6.88
17					0.1377								7.97	6.90
18					0.0871								7.85	6.85
19					0.0673								7.97	6.69
20					0.0582								8.02	6.64
21					0.0549							E15	7.85	6.62
22	35.04	13.15	25	9.38	0.045	3.84	89	1.4	2.22	91	0.8		7.52	6.74
23					0.0456								7.34	6.68
24					0.0485								7.24	6.78
25					0.0353								7.09	6.58
26					0.0408								7.19	6.52
27					0.0435								7.07	6.61
28					0.0416							E5	7.22	6.63
29														
30														
31														
Total	318.74	123.497	338.68	122.2141	2.6149	16.31	355.57	8.5773	13	358.36	6.5949	5	203.02	189.5
	AVG 79.69	AVG 30.87	AVI 84.67	AVG 30.55	AVG 0.093	AVG 4.08	AVG 94.88	AVG 2.14	AVG 3.25	AVG 96.16	AVG 1.65	GEM 4	AVG 7.25	MIN 6.52
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	RAD 51.54	MAX 42.25	MA 40.34	MAX 68.21	MAX 0.410	AVW 4.48		AVW 3.67	AVW 5.00		AVG 2.99	GMT 15	MAX 8.02	MA 7.02
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)					
Day 4 (CFU/100 mL)	5	1	15	5	
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)					
Day 4 (log)	0.69897	0	1.17609126	0.69897	
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.69897	0	1.17609126	0.69897	#DIV/0!
Week Avg:	**5**	**1**	**15**	**5**	**#DIV/0!**

Month Avg (log) 0.64350782

Month Avg:	**4**
HIGHEST WEEKLY	**15**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** March **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1	64.52	23.84	73	26.97	0.0443	3.54	95	1.3	1.92	97	0.7		7.52	6.62
2					0.0579								7.62	6.68
3					0.1131								7.70	6.80
4					0.1806								7.70	6.86
5					0.0946								7.67	6.81
6					0.077								7.57	6.71
7					0.0684							63	7.37	6.78
8	22.27	16.49	15.25	11.29	0.0888	4.26	81	3.2	3.34	78	2.5		7.44	6.81
9					0.1141								7.40	6.78
10					0.1549								7.70	6.81
11					0.1348								7.82	6.91
12					0.1379								8.02	6.84
13					0.1133								8.12	6.81
14					0.1298							E15	8.49	6.83
15	17.7	22.85	20	25.82	0.1548	4.42	75	5.7	4.47	78	5.8		8.47	6.85
16					0.126								8.34	6.95
17					0.121								8.37	6.88
18					0.2026								8.25	6.45
19					0.1579								8.32	6.92
20					0.0785								8.12	6.87
21					0.0658							E24	8.50	6.78
22	46.83	36.36	39	30.28	0.0931	4.74	90	3.7	0.81	98	0.6		8.62	6.76
23					0.1231								8.49	6.85
24					0.1014								8.72	6.87
25					0.1481								8.79	6.89
26					0.1086								8.57	6.83
27					0.109								8.74	6.85
28					0.1336							186	8.79	6.84
29	21.58	63.62	27.67	81.58	0.3535	5.77	73	17.0	4.72	83	13.9		8.84	6.65
30					0.295								9.04	6.44
31					0.1148								9.04	6.78
Total	172.9	163.165	174.92	175.9435	3.9963	22.73	413.55	30.861	15.26	433.98	23.498	249	254.15	210.5
	AVG 34.58	AVG 32.63	AVE 34.98	AVE 35.19	AVG 0.129	AVG 4.55	AVG 86.85	AVG 6.17	AVG 3.05	AVG 91.28	AVG 4.70	GEM 45	AVG 8.20	MIN 6.44
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 46.83	MAX 63.62	MA 39.00	MAX 81.58	MAX 0.354	AVW 5.77		AVG 17.01	AVW 4.72		AVG 13.92	GMT 186	MAX 9.04	MA 6.95
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	63	15	24	186	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.79934055	1.17609126	1.38021124	2.26951294	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.79934055	1.17609126	1.38021124	2.26951294	#DIV/0!
Week Avg:	**63**	**15**	**24**	**186**	**#DIV/0!**

Month Avg (log) 1.656289

Month Avg:	**45**
HIGHEST WEEKLY	**186**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** April **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequen	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0907								9.24	6.74	
2					0.0579								9.36	6.75	
3					0.0513								9.31	6.71	
4					0.0475							E7	8.99	6.65	
5	64.21	48.36	56.17	42.30	0.0903	4.83	92	3.6	7.03	87	5.3		9.34	6.79	
6					0.1133								9.46	6.86	
7					0.0886								9.49	6.93	
8					0.2342								9.02	6.86	
9					0.1621								9.16	6.86	
10					0.0931								9.16	6.78	
11					0.1034							E4	9.36	6.79	
12	51.64	33.64	37	24.10	0.0781	3.99	92	2.6	2.11	94	1.4		9.36	6.86	
13					0.1248								9.66	6.90	
14					0.0921								9.58	6.91	
15					0.0812								9.71	6.87	
16					0.0771								9.85	6.83	
17					0.0555								9.90	6.68	
18					0.0578							E2	10.22	6.61	
19	73.09	39.13	77.5	41.50	0.0642	4.82	93	2.6	3.11	96	1.7		10.35	6.69	
20					0.0694								10.12	6.74	
21					0.0889								10.74	6.81	
22					0.0765								10.42	6.80	
23					0.0772								10.17	6.71	
24					0.0781								10.79	6.77	
25					0.0614							E7	10.37	6.82	
26	52.42	23.52	35.5	15.93	0.0538	3.08	94	1.4	2.78	92	1.2		10.66	6.57	
27					0.0647								10.54	6.87	
28					0.0581								11.08	6.82	
29					0.0441								10.61	6.71	
30					0.0637								10.79	6.51	
31															
Total	241.36	144.647	206.17	123.8261	2.4991	16.72	372.28	10.199	15.03	369.94	9.5812	0	296.81	203.2	
	AVG 60.34	AVG 36.16	AVE 51.54	AVE 30.96	AVG 0.083	AVG 4.18	AVG 93.07	AVG 2.55	AVG 3.76	AVG 92.71	AVG 2.40	GEM 4	AVG 9.89	MIN 6.51	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 73.09	MAX 48.36	MA 77.50	MAX 42.30	MAX 0.234	AVW 4.83		AVW 3.64	AVW 7.03		AVW 5.29	GMF 7	MAX 11.08	MA 6.93	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM7=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	7	4	2	7	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.84509804	0.60205999	0.30103	0.84509804	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.84509804	0.60205999	0.30103	0.84509804	#DIV/0!
Week Avg:	7	4	2	7	#DIV/0!

Month Avg (log)	0.64832152
Month Avg:	4
HIGHEST WEEKLY	7

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** May **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0554								10.66	6.75	
2					0.0473							<1	10.59	6.63	
3	112.51	47.95	67	28.55	0.0511	1.85	98	0.8	4.5	93	1.9		10.93	6.54	
4					0.0629								12.03	6.27	
5					0.0622								11.72	6.04	
6					0.073								11.86	6.52	
7					0.0549								12.29	6.45	
8					0.043								12.15	6.32	
9					0.0402							178	12.44	6.43	
10	173.75	48.54	123.67	34.55	0.0335	4.19	98	1.2	3.61	97	1.0		12.12	6.43	
11					0.0391								12.12	6.50	
12					0.0514								11.98	6.56	
13					0.0507								12.15	6.12	
14					0.0354								11.93	6.36	
15					0.0344								11.78	6.46	
16					0.0434							<1	12.24	6.62	
17	75.43	31.08	65.5	26.99	0.0494	5.84	92	2.4	4.56	93	1.9		11.83	6.46	
18					0.0548								12.38	6.61	
19					0.0421								12.41	6.45	
20					0.0356								13.21	6.58	
21					0.038								13.14	6.36	
22					0.0328								14.15	6.25	
23					0.0308							E7	13.91	6.09	
24	149.7	34.58	128	29.57	0.0277	5.05	97	1.2	1.17	99	0.3		13.59	6.31	
25					0.0304								14.10	6.47	
26					0.0354								14.22	6.48	
27					0.0442								14.75	6.47	
28					0.0292								14.46	6.37	
29					0.0318								14.48	6.30	
30					0.0312							E4	14.23	6.16	
31	336.9	64.62	164.34	31.52	0.023	6.42	98	1.2	3.83	98	0.7		14.15	6.10	
Total	848.29	226.777	548.51	151.1856	1.3143	23.35	482.92	6.7632	17.67	480.16	5.81	178	394	198.5	
	AVG 169.66	AVG 45.36	AVG 109.70	AVG 30.24	AVG 0.042	AVG 4.67	AVG 97.25	AVG 1.35	AVG 3.53	AVG 96.78	AVG 1.16	GEM 5	AVG 12.71	MIN 6.04	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 336.90	MAX 64.62	MAX 164.34	MAX 34.55	MAX 0.073	AVW 6.42		AVW 2.41	AVW 4.56		AVW 1.92	GMT 178	MAX 14.75	MAX 6.62	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	178	1	7	4
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

4

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	2.25042	0	0.84509804	0.60205999
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	2.25042	0	0.84509804	0.60205999
Week Avg:		178	1	7	4

Month Avg (log) 0.73951561

Month Avg:	5
HIGHEST WEEKLY	178

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

PAPER WASTEWATER TREATMENT PLANT DISCHARGE MONITORING REPORT

Permit No.	**WA0024449**	**Month** MARCH	**Year** 2017
Facility Name	**Sekiu Wastewater Treatment Plant**	**County**	**Clallam**
Receiving Water	**Clallam Bay**	**Plant Operator**	
Plant Type	**Rotating Biological Contractor (RBC) with UV Disinfection**	**Population**	

QUARTERLY MONITORING

PARAMETER	UNITS	EFFLUENT
TOTAL AMMONIA	MG/L AS N	0.07
TOTAL PHOSPHORUS	MG/L AS P	0.690
SOLUBLE REACTIVE PHOSPHORUS	MG/L AS P	0.673
NITRATE + NITRITE	MG/L AS N	1.2
TOTAL KJELDAHL NITROGEN (TKN)	MG/L AS N	1.20

DATE SAMPLED 4-26-17

Quarterly is defined as: January-March, April-June, July-September, & October-December, Starting _____

ANNUAL MONITORING

PARAMETER	UNITS	EFFLUENT
DISSOLVED OXYGEN	MG/L	
OIL & GREASE	MG/L	
TOTAL DISSOLVED SOLIDS	MG/L	
TOTAL HARDNESS	MG/L	

DATE SAMPLED _____

Annual is defined as: January - December, Starting _____

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KIM MALAICOFF SENIOR OPERATOR
Name and Title

Signature

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** June **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1					0.0252								13.80	6.34
2					0.0403								14.24	6.59
3					0.0227								14.36	6.58
4					0.0289								14.72	6.52
5					0.0237								15.01	6.54
6					0.0216							E4	15.53	6.55
7	293.8	45.82	256.5	40.00	0.0187	5.56	98	0.9	2	99	0.3		15.22	6.57
8					0.0196								14.79	6.52
9					0.0184								14.46	6.51
10					0.0345								15.32	6.68
11					0.022								15.77	6.60
12					0.0171								15.08	6.43
13					0.0173							E2	14.79	6.23
14	192.86	27.50	149	21.25	0.0171	4.2	98	0.6	3.56	98	0.5		14.60	6.17
15					0.0223								14.29	6.39
16					0.0597								14.19	6.57
17					0.0483								14.07	6.46
18					0.0405								14.00	6.44
19					0.0355								14.63	6.49
20					0.0399							<1	15.06	6.46
21	123.71	33.43	104.17	28.15	0.0324	4.37	96	1.2	3.22	97	0.9		15.10	6.51
22					0.0336								15.94	6.59
23					0.0392								16.23	6.49
24					0.0263								16.63	6.54
25					0.0292								16.53	6.43
26					0.0254								16.94	6.46
27					0.0218							<1	17.08	6.41
28	175.21	31.42	114	20.44	0.0215	4.98	97	0.9	3.05	97	0.5		17.13	6.38
29					0.0205								17.03	6.40
30					0.0326								17.15	6.64
31														
Total	785.58	138.17	623.67	109.8425	0.8558	19.11	389.56	3.5399	11.83	391.06	2.2366	0	459.69	194.5
	AVG 196.40	AVG 34.54	AVE 155.92	AVE 27.46	AVG 0.029	AVG 4.78	AVG 97.57	AVG 0.88	AVG 2.96	AVG 98.10	AVG 0.56	GEM 2	AVG 15.32	MIN 6.17
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 293.80	MAX 45.82	MA 256.50	MA 40.00	MAX 0.060	AVW 5.56		AVW 1.18	AVW 3.56		AVW 0.87	GMT 4	MAX 17.15	MA 6.68
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	4	2	1	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0.60205999	0.30103	0	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0.60205999	0.30103	0	0	#DIV/0!
Week Avg:	**4**	**2**	**1**	**1**	**#DIV/0!**

Month Avg (log)	0.2257725
Month Avg:	**2**
HIGHEST WEEKLY	4

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

*/

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month July | Year 2017

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1					0.0235								16.80	6.55
2					0.0288								17.15	6.29
3					0.0286								17.46	6.16
4					0.0284							<1	17.61	6.15
5	213.86	45.12	158	33.34	0.0253	10.81	95	2.3	10.55	93	2.2		17.99	6.16
6					0.0257								17.77	6.04
7					0.0411								17.61	6.38
8					0.0344								17.89	6.37
9					0.0342								17.87	6.20
10					0.0282								17.96	6.40
11					0.0285							E3	17.99	6.21
12	360	72.36	182.34	36.65	0.0241	10.4	97	2.1	3.83	98	0.8		18.22	6.30
13					0.0253								17.42	6.53
14					0.0418								18.06	6.53
15					0.0229								17.34	6.62
16					0.0258								17.87	6.46
17					0.02								18.46	6.49
18					0.0205							E4	18.41	6.54
19	599	119.40	516	102.85	0.0239	12.38	98	2.5	7.78	98	1.6		18.22	6.52
20					0.0248								17.63	6.48
21					0.0413								17.82	6.49
22					0.0231								17.80	6.52
23					0.0246								18.57	6.39
24					0.0221								18.68	6.47
25					0.0213							E12	18.99	6.39
26	262.02	43.49	197.67	32.81	0.0199	22.29	91	3.7	12.78	94	2.1		18.46	6.29
27					0.0224								18.32	6.26
28					0.0197								18.77	6.41
29					0.0304								18.60	6.53
30					0.0303								19.08	6.47
31					0.0189								19.08	6.70
Total	1434.88	280.365	1054.01	205.6463	0.8298	55.88	381.48	10.538	34.94	383.25	6.6677	0	559.9	198.3
	AVG 358.72	AVG 70.09	AVG 263.50	AVG 51.41	AVG 0.027	AVG 13.97	AVG 96.11	AVG 2.63	AVG 8.74	AVG 96.69	AVG 1.67	GEM 3	AVG 18.06	GM 6.04
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 599.00	MAX 119.40	MA 516.00	MAX 102.85	MAX 0.042	AVW 22.29		AVW 3.70	AVW 12.78		AVW 2.23	GM 12	MAX 19.08	MA 6.70
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM7=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	3	4	12	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.47712125	0.60205999	1.07918125	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.47712125	0.60205999	1.07918125	#DIV/0!

Week Avg:		3	4	12	#DIV/0!

Month Avg (log) 0.53959062

Month Avg:	3
HIGHEST WEEKLY	12

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** August **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS
1					0.0204							E16	19.01	6.43
2	288.3	45.44	290.34	45.77	0.0189	23.91	92	3.8	10.89	96	1.7		19.03	6.39
3					0.0209								18.58	6.41
4					0.0208								19.41	6.49
5					0.0306								19.06	6.67
6					0.0231								18.94	6.69
7					0.0256								18.72	6.75
8					0.0204							E32	18.72	6.67
9	433.3	77.70	298.34	53.50	0.0215	24.31	94	4.4	11.11	96	2.0		18.56	6.53
10					0.0234								18.99	6.54
11					0.0204								18.13	6.55
12					0.0331								18.58	6.71
13					0.0236								18.82	6.65
14					0.0221								18.41	6.65
15					0.018							50	18.56	6.56
16	427.2	72.68	287	48.83	0.0204	24.42	94	4.2	9	97	1.5		17.99	6.53
17					0.0244								18.18	6.49
18					0.0252								18.15	6.61
19					0.0392								18.63	6.65
20					0.0276								18.27	6.62
21					0.0225								18.51	6.59
22					0.0224							E17	18.56	6.58
23	415.1	73.39	309.34	54.69	0.0212	17.19	96	3.0	4.94	98	0.9		17.96	6.77
24					0.0205								17.87	6.63
25					0.0188								17.63	6.56
26					0.0406								18.41	6.62
27					0.0222								18.32	6.58
28					0.0196								18.82	6.49
29					0.02							E10	19.01	6.53
30	246.23	39.63	170.34	27.42	0.0193	16.93	93	2.7	6.44	96	1.0		18.46	6.49
31					0.0217								18.84	6.65
Total	1810.13	308.847	1355.36	230.2016	0.7284	106.76	469.36	18.047	42.38	484.01	7.1499	50	575.13	204.1
	AVG 362.03	AVG 61.77	AVG 271.07	AVG 46.04	AVG 0.023	AVG 21.35	AVG 94.10	AVG 3.61	AVG 8.48	AVG 96.87	AVG 1.43	GEM 21	AVG 18.55	MIN 6.39
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 433.30	MAX 77.70	MA 309.34	MAX 54.69	MAX 0.041	AVW 24.42		AVW 4.36	AVW 11.11		AVW 1.99	GMT 50	MAX 19.41	MA 6.77
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	16	32	50	17	10
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

					10
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.20411998	1.50514998	1.69897	1.23044892	1
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.20411998	1.50514998	1.69897	1.23044892	1
Week Avg:	**16**	**32**	**50**	**17**	**10**

Month Avg (log)	1.32773778
Month Avg:	**21**
HIGHEST WEEKLY	**50**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** September **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0282								18.63	6.73	
2					0.0177								18.79	6.71	
3					0.0197								19.10	6.60	
4					0.0234								18.65	6.53	
5					0.0222							E20	18.46	6.55	
6	358.8	52.07	247	35.84	0.0174	14.36	96	2.1	5.17	98	0.8		18.58	6.63	
7					0.014								18.28	6.61	
8					0.0154								18.46	6.67	
9					0.025								18.20	6.71	
10					0.0267								18.13	6.60	
11					0.0158								17.87	6.53	
12					0.0172							E5	17.56	6.51	
13	252.09	37.21	250.33	36.95	0.0177	9.75	96	1.4	3.31	99	0.5		17.44	6.48	
14					0.0169								17.06	6.48	
15					0.016								16.42	6.37	
16					0.0215								16.37	6.46	
17					0.0147								15.92	6.52	
18					0.0172								16.11	6.56	
19					0.0206							E2	15.80	6.35	
20	245.11	33.12	176	23.78	0.0162	10.72	96	1.4	2.78	98	0.4		15.84	6.41	
21					0.0191								15.80	6.31	
22					0.0232								15.44	6.44	
23					0.0145								15.68	6.50	
24					0.0152								15.94	6.47	
25					0.0182								15.72	6.45	
26					0.0144							<1	16.15	6.42	
27	359.2	36.55	289.34	29.44	0.0122	8.16	98	0.8	4.44	98	0.5		16.56	6.36	
28					0.0133								16.49	6.44	
29					0.0131								15.94	6.47	
30					0.0296								15.84	6.57	
31															
Total	1215.2	158.945	962.67	126.0156	0.5563	42.99	385.48	5.8018	15.7	393.47	2.0662	0	511.23	195.4	
	AVG 303.80	AVG 39.74	AVG 240.67	AVG 31.50	AVG 0.019	AVG 10.75	AVG 96.46	AVG 1.45	AVG 3.93	AVG 98.37	AVG 0.52	GEM 4	AVG 17.04	MIN 6.31	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 359.20	MAX 52.07	MIN 289.34	MAX 36.95	MAX 0.030	AVW 14.36		AVW 2.08	AVW 5.17		AVW 0.75	GMT 20	MAX 19.10	MIN 6.71	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GMT=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	20	5	2	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	1.30103	0.69897	0.30103	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	1.30103	0.69897	0.30103	0	#DIV/0!
Week Avg:	**20**	**5**	**2**	**1**	**#DIV/0!**

Month Avg (log) 0.5752575

Month Avg:	**4**
HIGHEST WEEKLY	**20**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 **Month** October **Year** 2017

Facility Nam Sekiu POTW **County** Clallam

Receiving Water Strait of Juan de Fuca **Plant Operator** Kim Malakoff

Plant Typ RBC **Population** 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.0199								15.61	6.50	
2					0.0186								15.20	6.46	
3					0.0128							<1	14.77	6.42	
4	221.4	21.42	236	22.83	0.0116	7.17	97	0.7	5	98	0.5		16.34	6.43	
5					0.0107								13.95	6.31	
6					0.0201								13.38	6.52	
7					0.018								13.45	6.54	
8					0.0228								13.69	6.43	
9					0.0193								13.45	6.39	
10					0.0144							E13	13.19	6.34	
11	161	18.40	115.5	13.20	0.0137	5.27	97	0.6	2.17	98	0.2		13.02	6.44	
12					0.0127								12.78	6.48	
13					0.0122								12.75	6.48	
14					0.0117								12.44	6.45	
15					0.0278								12.22	6.44	
16					0.0142								12.61	6.42	
17					0.0238							274	13.11	6.47	
18	201	103.77	220.67	113.92	0.0619	13.73	93	7.1	13.44	94	6.9		13.31	6.38	
19					0.2311								13.28	6.72	
20					0.1809								12.87	6.75	
21					0.1038								12.78	6.85	
22					0.2549								12.80	6.82	
23					0.1877								12.94	6.37	
24					0.0969							<1	12.90	6.75	
25	26.16	13.98	23.75	12.70	0.0641	7.64	71	4.1	6.96	71	3.7		12.92	6.83	
26					0.0585								12.70	6.81	
27					0.0556								12.53	6.83	
28					0.0399								12.51	6.71	
29					0.0345								12.44	6.68	
30					0.0311								12.39	6.61	
31					0.03							E3	12.07	6.65	
Total	609.56	157.5651	595.92	162.645	1.7152	33.81	357.45	12.4681	27.57	360.607	11.391	274	410.4	203.3	
	AVG 152.39	AVG 39.39	AVG 148.98	AVG 40.66	AVG 0.055	AVG 8.45	AVG 94.45	AVG 3.12	AVG 6.89	AVG 95.37	AVG 2.85	GEM 8	AVG 13.24	MIN 6.31	
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**	
	MAX 221.40	MAX 103.77	MAX 236.00	MAX 113.92	MAX 0.255	AVG 13.73		AVG 7.09	AVG 13.44		AVG 6.94	GM 274	MAX 16.34	MAX 6.85	
Limits						**45**		**30**	**45**		**39**	**400**		**9**	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	13	274	1	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					
					0
Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	1.11394335	2.43775056	0	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	1.11394335	2.43775056	0	#DIV/0!
Week Avg:		**13**	**274**	**1**	**#DIV/0!**

Month Avg (log) 0.88792348

Month Avg:	**8**
HIGHEST WEEKLY	**274**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month November | Year 2017

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

	INFLUENT				EFFLUENT									
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	PH STANDARD UNITS
1	142.88	32.41	115	26.09	0.0272	5.3	96	1.2	3.89	97	0.9		17.39	6.71
2					0.0282								11.90	6.60
3					0.0414								11.64	6.61
4					0.0419								10.96	6.85
5					0.0682								10.61	6.80
6					0.0472								10.42	6.79
7					0.041							<1	10.25	6.90
8	65.28	20.31	55.5	17.27	0.0373	3.72	94	1.2	2.94	95	0.9		10.57	6.99
9					0.0453								11.03	6.83
10					0.047								11.22	6.88
11					0.0436								11.05	6.89
12					0.128								11.15	6.80
13					0.2719								11.08	6.80
14					0.2543							E8	10.81	6.93
15	13.98	49.44	18.75	66.30	0.424	5.53	60	19.6	9.12	51	32.2		10.64	6.63
16					0.2674								10.61	6.94
17					0.1587								10.54	6.93
18					0.1179								10.74	6.98
19					0.0817								10.76	6.99
20					0.1523								10.69	6.82
21					0.1221							E4	10.37	7.01
22	24.24	86.16	42.84	152.28	0.4262	6.08	75	21.6	29.67	31	105.5		10.98	6.67
23					0.2321								10.69	6.86
24					0.1587								10.74	6.90
25					0.1237								10.66	7.09
26					0.1547								10.66	6.99
27					0.1497								10.42	7.03
28					0.1106							E3	10.32	7.10
29	12.96	12.61	17.5	17.03	0.1167	3.6	72	3.5	5.07	71	4.9		10.17	7.07
30					0.0806								10.27	7.20
31														
Total	259.34	200.9299	249.59	278.9631	3.9996	24.23	398.18	47.0297	50.69	344.451	144.4436	0	329.34	206.6
	AVG 51.87	AVG 40.19	AVE 49.92	AVG 55.79	AVG 0.133	AVG 4.85	AVG 90.66	AVG 9.41	AVG 10.14	AVG 79.69	AVG 28.89	GEM 3	AVG 10.98	MIN 6.60
Permit		**135**		**171**	**0.145**	**30**	**85**	**20**	**30**	**85**	**26**	**200**		**6**
	MAX 65.28	MAX 86.16	MIN 55.50	MAX 152.28	MAX 0.426	AVW 6.08		AVW 21.61	AVW 29.67		AVW 105.46	GM 8	MAX 11.64	MIN 7.20
Limits						**45**		**30**	**45**		**39**	**400**		**9**

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM=Highest 7-day Geometric Mean

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Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT LAB

Fecal Coliform

Weekly and Monthly Averages

Sekiu

	Week 1	Week 2	Week 3	Week 4	Week 5
Day 1 (CFU/100 mL)					
Day 2 (CFU/100 mL)					
Day 3 (CFU/100 mL)	1	8	4	3	
Day 4 (CFU/100 mL)					
Day 5 (CFU/100 mL)					
Day 6 (CFU/100 mL)					
Day 7 (CFU/100 mL)					

0

Day 1 (log)					
Day 2 (log)					
Day 3 (log)	0	0.90308999	0.60205999	0.47712125	
Day 4 (log)					
Day 5 (log)					
Day 6 (log)					
Day 7 (log)					
Week Avg (log)	0	0.90308999	0.60205999	0.47712125	#DIV/0!

Week Avg:		**8**	**4**	**3**	**#DIV/0!**

Month Avg (log) 0.49556781

Month Avg:	**3**
HIGHEST WEEKLY	**8**

Instructions:

Within each week, enter daily fecal coliform results in the upper grid (this is the only place data should be entered). If a daily result is zero, enter a value of one. (Within a particular week, it does not matter which days the data are entered into.)

Excel automatically calculates the logs and displays the results in Cells C15 – C21. The weekly average results are automatically calculated and displayed in Cells C25 – G25. The monthly average result is automatically calculated and displayed in Cell C30.

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 — Month December — Year 2017

Facility Nam Sekiu POTW — County Clallam

Receiving Water Strait of Juan de Fuca — Plant Operator Kim Malakoff

Plant Typ RBC — Population 300

	INFLUENT				EFFLUENT										
Frequer	1/WEEK	1/WEEK	1/WEEK	1/WEEK	CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
Date	BOD 5-DAY MG/L	BOD 5-DAY LBS/DAY	TSS MG/L	TSS LBS/DAY	FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML	Effluent Temp. C	pH STANDARD UNITS	
1					0.1019								10.10	7.16	
2					0.1483								9.93	7.17	
3					0.1014								9.73	7.13	
4					0.0635								9.26	7.11	
5					0.0495							E2	8.97	7.18	
6	28.59	9.99	27	9.44	0.0419	3.91	86	1.4	2.78	90	1.0		8.82	7.20	
7					0.037								8.78	7.21	
8					0.0325								8.64	7.17	
9					0.0338								8.47	7.10	
10					0.022								8.32	7.14	
11					0.0203								8.27	7.19	
12					0.0187							E13	8.47	7.15	
13	33.18	4.90	27.25	4.02	0.0177	3.79	89	0.6	3.59	87	0.5		8.45	7.10	
14					0.0211								8.45	7.10	
15					0.0172								8.62	7.08	
16					0.0246								8.68	7.09	
17					0.0169								9.19	7.07	
18					0.055								9.31	7.13	
19					0.0566							40	9.19	7.23	
20	24.66	23.47	28.75	27.36	0.1141	4.35	82	4.1	2.84	90	2.7		8.15	7.16	
21					0.0805								7.92	7.16	
22					0.0683								8.05	7.19	
23					0.0594								7.82	7.17	
24					0.0408								7.38	7.16	
25					0.0377								7.49	7.26	
26					0.0377							<1	7.59	7.19	
27	36.65	10.76	29.5	8.66	0.0352	3.7	90	1.1	2.92	90	0.9		7.59	7.20	
28					0.0386								8.15	7.16	
29					0.129								8.25	6.99	
30					0.2657								8.35	6.95	
31					0.1103								8.32	7.15	
Total	123.08	49.1142	112.5	49.47622	1.8972	15.75	347.17	7.1514	12.13	356.75	5.0612	40	264.71	221.5	
	AVG 30.77	AVG 12.28	AVG 28.13	AVG 12.37	AVG 0.061	AVG 3.94	AVG 87.20	AVG 1.79	AVG 3.03	AVG 89.22	AVG 1.27	GEM 6	AVG 8.54	MIN 6.95	
Permit		135		171	0.145	30	85	20	30	85	26	200		6	
	MAX 36.65	MAX 23.47	MA 29.50	MAX 27.36	MAX 0.266	AVW 4.35		AVW 4.14	AVW 3.59		AVW 2.70	GMI 40	MAX 9.73	MA 7.26	
Limits						45		30	45		39	400		9	

AVG=Average **AVW** =Highest Weekly Average **GEM**=Geometric Mean **MAX**=Maximum **MIN**=Minimum
GM7=Highest 7-day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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 fals information, including the possibility of fine and imprisonment for knowing violations.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

WASTEWATER TREATMENT PLANT MONITORING REPORT

Permit No WA0024449 | Month January | Year 2018

Facility Nam Sekiu POTW | County Clallam

Receiving Water Strait of Juan de Fuca | Plant Operator Kim Malakoff

Plant Typ RBC | Population 300

EFFLUENT

Frequer					CONT	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	1/WEEK	DAILY	5/WEEK	
					FLOW MGD	BOD 5-DAY MG/L	BOD 5-DAY % REMOVAL	BOD 5-DAY LBS/DAY	TSS MG/L	TSS % REMOVAL	TSS LBS/DAY	FECAL COLIFORM #/100 ML Effluent	pH Temp. C STANDARD UNITS		
1					0.0626								7.97	7.22	
2					0.049							<1	7.70	7.20	
3	19.38	6.91	16.5	5.12	0.0372	3.66	80	1.2	2.23	85	0.7		7.67	7.15	
4					0.0586								8.05	7.12	
5					0.0464								8.52	7.12	
6					0.0725								8.52	7.07	
7					0.0748								8.48	7.08	
8					0.0941								8.78	6.89	
9					0.1195							E5	8.64	7.08	
10	22.5	16.81	45.17	33.75	0.0896	4.51	80	3.4	4.88	89	3.6		8.54	7.11	
11					0.1273								8.52	7.07	
12					0.2801								8.62	6.89	
13					0.2061								8.74	6.88	
14					0.1435								8.72	7.07	
15					0.094								8.87	6.98	
16					0.0793							E13	8.92	7.02	
17	24.86	25.66	30.75	29.00	0.1165	5.8	76	5.8	6	90	5.8		8.89	6.86	
18					0.1913								8.89	7.00	
19					0.1452								8.77	7.02	
20					0.1803								8.62	6.97	
21					0.3009								8.54	6.45	
22					0.3235								8.57	6.76	
23					0.1806							E16	8.89	6.85	
24	11.7	17.27	8.75	12.92	0.1771	4.5	92	6.6	2.78	88	4.1		8.69	0.00	
25					0.1704								8.54	6.98	
26					0.1399								8.42	6.99	
27					0.1767								8.49	6.87	
28					0.1796								8.52	6.97	
29					0.4018								8.74	6.52	
30					0.3685								8.59	6.95	
31	9	12.47	5.25	7.27	0.1661	4.33	52	6.0	1.79	66	2.6		8.37	6.90	
Total	87.24	76.555	106.42	88.97222	4.8511	23	349.85	22.853	17.68	390.3	16.759	e15	264.59	209	
	17.45	16.31	21.28	17.79	0.156	4.60	73.64	4.57	3.54	83.39	3.35	7	8.54		
	24.66	23.98	45.17	33.75	0.402	5.80		6.85	6.00		5.83	18	8.92	7.15	

AVG=Average AVW =Highest Weekly Average GEM=Geomsinc Mean MAX=Maximum MIN=Minimum
GAW=Highest 7-Day Geometric Mean

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those 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.

Please Circle ALL Permit Violations Mail to P.O. Box 47775, Olympia WA 98504-7775

Kim Malakoff - Senior Operator
Name and Title

Signature

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024449 **Permittee:** SEKIU STP

Facility County: Clallam **Receiving Waterbody:** Strait Of Juan De Fuca (West)

Monitoring Period: 02/01/2018 - 02/28/2018 **Outfall:** 001 - Clallam Bay Strait of Juan de Fuca **Version:** 1

Week	Monitoring Point	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total BOD5 Total Lbs/Day Weekly Calculated	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Calculated	Flow Million Gallons/Day Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total BOD5 Total Percent Summary Only Calculated	Total BOD5 Total Lbs/Day Weekly Calculated	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residue) Total suspended (TSS) Percent Summary Only Calculated	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Calculated
		00310	00310	00530	00530	50050	00310	00310	00310	00530	00530	00530
		19	19	19	19	1	1	1	1	1	1	1
1-Th	2/1/18					.1445						
1-F	2/2/18					.148						
1-Sa	2/3/18					.1315						
2-Su	2/4/18					.1078						
2-M	2/5/18					.0806						
2-T	2/6/18					.079						
2-W	2/7/18	25.53	12.71	20.50	10.21	.0597	4.31	83	2.1	2.76	87	1.4
2-Th	2/8/18					.0579						
2-F	2/9/18					.0473						
2-Sa	2/10/18					.0534						
3-Su	2/11/18					.0403						
3-M	2/12/18					.0391						
3-T	2/13/18					.0385						
3-W	2/14/18	47.70	14.20	42.75	12.73	.0357	5.01	89	1.5	4.11	90	1.2
3-Th	2/15/18					.0425						
3-F	2/16/18					.038						
3-Sa	2/17/18					.0614						
4-Su	2/18/18					.1128						
4-M	2/19/18					.064						
4-T	2/20/18					.0582						
4-W	2/21/18	37.23	15.00	28.0	11.26	.0483	5.69	85	2.3	2.58	91	1.0
4-Th	2/22/18					.0466						
4-F	2/23/18					.0419						
4-Sa	2/24/18					.0547						
5-Su	2/25/18					.0691						
5-M	2/26/18					.0778						
5-T	2/27/18					.0647						
5-W	2/28/18	58.36	31.54	34.5	18.64	.0648	5.17	91	2.8	2.61	92	1.4
Minimum												
Average		42.205	18.3625	31.4375	13.215	0.0681464	5.045	88.05	2.175	3.015	90.43	1.25
		Report Only	DL: 135	Report Only	DL: 171	DL: 0.145	<= 30	>= 85	<= 20	<= 30	>= 85	<= 26
Weekly Average							5.69		2.79	4.11		1.41
							<= 45		<= 30	<= 45		<= 39
Maximum		58.36	31.54	42.75	18.64	0.148						
		Report Only	Report Only	Report Only	Report Only	Report Only						
Daily Maximum												
Monthly geometric mean												
Weekly Geometric Mean												

Week	Monitoring Point	Fecal Coliform MPN/ml Weekly Grab	Temperature Measured Degrees C 1/Day Measurement	pH Standard Units 1/Day Grab
		3796	00010	00400
1-Th	2/1/18		8.44	6.93
1-F	2/2/18		8.77	6.91
1-Sa	2/3/18		8.97	6.92
2-Su	2/4/18		9.18	6.94
2-M	2/5/18		9.11	6.96
2-T	2/6/18	24	8.97	6.98
2-W	2/7/18		9.21	6.92
2-Th	2/8/18		9.28	6.92
2-F	2/9/18		8.91	6.97
2-Sa	2/10/18		8.82	6.85
3-Su	2/11/18		8.52	6.92
3-M	2/12/18		8.25	6.88
3-T	2/13/18	9	7.70	6.85
3-W	2/14/18		7.87	6.80
3-Th	2/15/18		7.92	6.89
3-F	2/16/18		8.34	6.89
3-Sa	2/17/18		8.37	6.82
4-Su	2/18/18		8.07	6.94
4-M	2/19/18		7.39	7.03
4-T	2/20/18	1	7.09	7.01
4-W	2/21/18		6.97	6.98
4-Th	2/22/18		6.86	6.97
4-F	2/23/18		6.69	6.98
4-Sa	2/24/18		7.04	6.99
5-Su	2/25/18		7.17	7.01
5-M	2/26/18		7.14	7.04
5-T	2/27/18	40	7.39	7.08
5-W	2/28/18		7.54	7.11
Minimum				6.8
				>= 6.0
Average			8.07786	
			Report Only	
Weekly Average				
Maximum				7.11
				<= 9.0
Daily Maximum			9.28	
			Report Only	
Monthly geometric mean		9.64114		
		<= 200		
Weekly Geometric Mean		40		
		<= 400		

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024449 **Permittee:** SEKIU STP

Facility County: Clallam **Receiving Waterbody:** Strait Of Juan De Fuca (West)

Monitoring Period: 03/01/2018 - 03/31/2018 **Outfall:** 001 - Clallam Bay Strait of Juan de Fuca **Version:** 1

Week	Monitoring Point	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total BOD5 Total Lbs/Day Weekly Calculated	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Calculated	Flow Million Gallons/Day Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total BOD5 Total Percent Summary Only Calculated	Total BOD5 Total Lbs/Day Weekly Calculated	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residue) Total suspended (TSS) Percent Summary Only Calculated	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Calculated
1-Th	3/1/18					.1006						
1-F	3/2/18					.0806						
1-Sa	3/3/18					.0660						
2-Su	3/4/18					.0631						
2-M	3/5/18					.0487						
2-T	3/6/18					.0491						
2-W	3/7/18	39.07	14.99	31.5	12.08	.0460	5.30	86	2.03	2.49	92	2.49
2-Th	3/8/18					.0430						
2-F	3/9/18					.0636						
2-Sa	3/10/18					.0585						
3-Su	3/11/18					.0621						
3-M	3/12/18					.0459						
3-T	3/13/18					.0433						
3-W	3/14/18	77.65	28.11	58.34	21.12	.0434	5.01	94	1.81	3.08	94.72	1.11
3-Th	3/15/18					.0436						
3-F	3/16/18					.0336						
3-Sa	3/17/18					.0501						
4-Su	3/18/18					.0395						
4-M	3/19/18					.0324						
4-T	3/20/18					.0321						
4-W	3/21/18	90.26	6.03	60	15.36	.0307	6.03	93	1.54	1.67	97	0.43
4-Th	3/22/18					.0370						
4-F	3/23/18					.0560						
4-Sa	3/24/18					.0639						
5-Su	3/25/18					.0492						
5-M	3/26/18					.0506						
5-T	3/27/18					.0708						
5-W	3/28/18	34.14	23.29	27.25	18.59	.0818	5.56	84	3.79	3.07	88.73	2.09
5-Th	3/29/18					.0617						
5-F	3/30/18					.0654						
5-Sa	3/31/18					.0492						
Minimum												
Average		60.28	18.105	44.2725	18.7875	0.0538613	5.475	89.25	2.2925	2.5775	93.11	1.53
		Report Only	DL: 135	Report Only	DL: 171	DL: 0.145	<= 30	>= 85	<= 20	<= 30	>= 85	<= 26
Weekly Average							6.03		3.79	3.08		2.49
							<= 45		<= 30	<= 45		<= 39
Maximum		90.26	28.11	60	21.12	0.1006						
		Report Only	Report Only	Report Only	Report Only	Report Only						
Daily Maximum												
Monthly geometric mean												
Weekly Geometric Mean												

Week	Monitoring Point	Fecal Coliform #/100ml Weekly Grab	Temperature Measured Degrees C 1/Day Measurement	pH Standard Units 1/Day Grab
1-Th	3/1/18		7.53	7.07
1-F	3/2/18		7.72	7.03
1-Sa	3/3/18		7.75	7.01
2-Su	3/4/18		7.60	6.96
2-M	3/5/18		7.70	6.97
2-T	3/6/18	B|1	7.87	6.98
2-W	3/7/18		7.67	6.97
2-Th	3/8/18		7.87	6.92
2-F	3/9/18		7.92	6.97
2-Sa	3/10/18		7.80	7.00
3-Su	3/11/18		8.02	7.01
3-M	3/12/18		8.34	6.98
3-T	3/13/18	B|1	8.47	6.97
3-W	3/14/18		8.59	6.89
3-Th	3/15/18		8.54	6.92
3-F	3/16/18		8.49	6.93
3-Sa	3/17/18		8.25	6.87
4-Su	3/18/18		8.72	6.83
4-M	3/19/18		8.53	6.80
4-T	3/20/18	9	8.78	6.81
4-W	3/21/18		8.97	6.82
4-Th	3/22/18		8.72	6.76
4-F	3/23/18		8.32	6.87
4-Sa	3/24/18		8.34	6.92
5-Su	3/25/18		8.27	6.85
5-M	3/26/18		8.59	6.85
5-T	3/27/18	7	8.99	6.95
5-W	3/28/18		9.09	6.97
5-Th	3/29/18		9.19	6.97
5-F	3/30/18		9.34	6.95
6-Sa	3/31/18		9.19	6.88
Minimum				6.76
				>= 6.0
Average			8.36032	
			Report Only	
Weekly Average				
Maximum				8.89
				<= 9.0
Daily Maximum			9.34	
			Report Only	
Monthly geometric mean		3		
		<= 200		
Weekly Geometric Mean		9		
		<= 400		

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024449 **Permittee:** SEKIU STP

Facility County: Clallam **Receiving Waterbody:** Strait Of Juan De Fuca (West)

Monitoring Period: 04/01/2018 - 04/30/2018 **Outfall:** 001 - Clallam Bay Strait of Juan de Fuca **Version:** 1

Week	Monitoring Point	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total BOD5 Total Lbs/Day Weekly Calculated	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Calculated	Flow Billion Gallons/Day Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total BOD5 Total Percent Summary Only Calculated	Total BOD5 Total Lbs/Day Weekly Calculated	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residue) Total suspended (TSS) Percent Summary Only Calculated	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Calculated
		INF	INF	INF	INF	001	001	001	001	001	001	001
1-Su	4/1/18					.0466						
1-M	4/2/18					.0394						
1-T	4/3/18					.0395						
1-W	4/4/18	85.41	10.33	50.0	17.39	.0417	5.90	93	2.05	2.06	96	.72
1-Th	4/5/18					.0941						
1-F	4/6/18					.1529						
1-Sa	4/7/18					.1352						
2-Su	4/8/18					.2324						
2-M	4/9/18					.1681						
2-T	4/10/18					.1052						
2-W	4/11/18	29.1	24.08	33.0	27.30	.0992	4.24	85	3.51	6.22	81	5.15
2-Th	4/12/18					.1066						
2-F	4/13/18					.0830						
2-Sa	4/14/18					.2125						
3-Su	4/15/18					.1201						
3-M	4/16/18					.0960						
3-T	4/17/18					.1068						
3-W	4/18/18	44.25	32.40	35.5	25.99	.0878	4.81	89	3.52	3.28	91	2.40
3-Th	4/19/18					.0772						
3-F	4/20/18					.0645						
3-Sa	4/21/18					.0614						
4-Su	4/22/18					.0582						
4-M	4/23/18					.0458						
4-T	4/24/18					.0454						
4-W	4/25/18	75.18	28.78	53.0	20.29	.0459	6.23	92	2.38	2.39	96	91
4-Th	4/26/18					.0468						
4-F	4/27/18					.0472						
4-Sa	4/28/18					.0353						
5-Su	4/29/18					.0559						
5-M	4/30/18					.0454						
Minimum												
Average		58.485	23.8975	42.875	22.7425	0.0865367	5.295	89.75	2.865	3.4875	91	2.295
		Report Only	DL: 135	Report Only	DL: 171	DL: 0.145	<= 30	>= 85	<= 20	<= 30	>= 85	<= 26
Weekly Average							6.23		3.52	6.22		5.15
							<= 45		<= 30	<= 45		<= 39
Maximum		85.41	32.4	53	27.3	0.2324						
		Report Only	Report Only	Report Only	Report Only	Report Only						
Daily Maximum												
Monthly geometric mean												
Weekly Geometric Mean												

Week	Monitoring Point	Fecal Coliform #/100ml 1/Week Grab	Temperature Measured Degrees C 1/Day Measurement	pH Standard Units 1/Day Grab
1-Su	4/1/18		10.20*	6.91
1-M	4/2/18		8.90	6.92
1-T	4/3/18	1	9.30	6.90
1-W	4/4/18		9.80	6.84
1-Th	4/5/18		9.14	6.85
1-F	4/6/18		9.41	6.80
1-Sa	4/7/18		9.53	6.95
2-Su	4/8/18		9.49	6.86
2-M	4/9/18		9.71	6.88
2-T	4/10/18	7	9.90	7.01
2-W	4/11/18		9.66	6.96
2-Th	4/12/18		9.76	6.98
2-F	4/13/18		9.81	7.00
2-Sa	4/14/18		9.76	6.79
3-Su	4/15/18		9.81	6.93
3-M	4/16/18		9.68	6.94
3-T	4/17/18	1	9.76	6.88
3-W	4/18/18		9.98	6.93
3-Th	4/19/18		10.42	6.93
3-F	4/20/18		9.93	6.86
3-Sa	4/21/18		10.30	6.82
4-Su	4/22/18		10.57	6.82
4-M	4/23/18		10.83	6.82
4-T	4/24/18	2	10.96	6.84
4-W	4/25/18		11.42	6.77
4-Th	4/26/18		11.71	6.73
4-F	4/27/18		11.64	6.80
4-Sa	4/28/18		11.39	6.72
5-Su	4/29/18		11.08	6.69
5-M	4/30/18		11.76	6.69
Minimum				6.69
				>= 6.0 (RO)
Average			10.17	
			Report Only	
Weekly Average				
Maximum				7.01
				<= 9.0 (RO)
Daily Maximum			11.76	
			Report Only	
Monthly geometric mean		1.93434		
		<= 200		
Weekly Geometric Mean		7.0		
		<= 400		

Washington State Department of Ecology — Discharge Monitoring Report (DMR)

Permit Number: WA0024449
Permittee: SEKIU STP
Facility County: Clallam
Receiving Waterbody: Strait Of Juan De Fuca (West)
Monitoring Period: 05/01/2018 - 05/31/2018
Outfall: 001 - Clallam Bay Strait of Juan de Fuca
Version: 1

Week	Monitoring Point	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour) INF	Total BOD5 Total Lbs/Day Weekly Calculated INF	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour) INF	Total suspended (TSS) Lbs/Day Weekly Calculated INF	Flow Billion Gallons/Day Continuous Metered/Recorded 001	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour) 001	Total BOD5 Total Percent Summary Only Calculated 001	Total BOD5 Total Lbs/Day Weekly Calculated 001	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour) 001	Solids (Residue) Total suspended (TSS) Percent Summary Only Calculated 001	Solids (Residue) Total suspended (TSS) Lbs/Day Weekly Calculated 001
1-T	5/1/18					.0393						
1-W	5/2/18	91.93	29.59	76.5	24.63	.0386	10.18	89	3.28	15.22	80	4.90
1-Th	5/3/18					.0346						
1-F	5/4/18					.0410						
1-Sa	5/5/18					.0420						
2-Su	5/6/18					.0331						
2-M	5/7/18					.0294						
2-T	5/8/18					.0273						
2-W	5/9/18	164.66	30.04	141.34	32.65	.0277	4.63	97	1.07	1.55	99	0.36
2-Th	5/10/18					.0326						
2-F	5/11/18					.0386						
2-Sa	5/12/18					.0389						
3-Su	5/13/18					.0431						
3-M	5/14/18					.0284						
3-T	5/15/18					.0261						
3-W	5/16/18	186	33.35	127.67	22.89	.0215	7.05	96	1.26	2.72	98	0.49
3-Th	5/17/18					.0223						
3-F	5/18/18					.0181						
3-Sa	5/19/18					.0240						
4-Su	5/20/18					.0194						
4-M	5/21/18					.0248						
4-T	5/22/18					.0172						
4-W	5/23/18	232.18	34.08	135	19.82	.0176	6.54	97	0.96	1.50	99	0.22
4-Th	5/24/18					.0188						
4-F	5/25/18					.0257						
4-Sa	5/26/18					.0289						
5-Su	5/27/18					.0294						
5-M	5/28/18					.0276						
5-T	5/29/18					.0224						
5-W	5/30/18	352.20	44.94	274.34	35.01	.0153	7.61	98	0.97	3.09	99	0.39
5-Th	5/31/18					.0141						
Minimum												
Average		205.394	34.4	150.97	27	0.0279871	7.202	95.4	1.508	4.816	95	1.272
		Report Only	DL: 135	Report Only	DL: 171	DL: 0.145	<= 30	>= 65	<= 20	<= 30	>= 65	<= 26
Weekly Average							10.18		3.28	15.22		4.90
							<= 45		<= 30	<= 45		<= 39
Maximum		352.2	44.94	274.34	35.01	0.0431						
		Report Only	Report Only	Report Only	Report Only	Report Only						
Daily Maximum												
Monthly geometric mean												
Weekly Geometric Mean												

Week	Monitoring Point	Fecal Coliform Part/100ml Weekly Grab 001	Temperature Measured Degrees C 1/Day Measurement 001	pH Standard Units 1/Day Grab 001
1-T	5/1/18	1	11.98	6.85
1-W	5/2/18		12.17	6.82
1-Th	5/3/18		12.17	6.72
1-F	5/4/18		11.79	6.72
1-Sa	5/5/18		12.73	6.57
2-Su	5/6/18		12.90	6.52
2-M	5/7/18		13.21	6.50
2-T	5/8/18	1	13.11	6.71
2-W	5/9/18		12.73	6.48
2-Th	5/10/18		12.56	6.34
2-F	5/11/18		13.43	6.34
2-Sa	5/12/18		14.19	6.09
3-Su	5/13/18		14.65	6.34
3-M	5/14/18		15.08	6.47
3-T	5/15/18	3	15.08	6.35
3-W	5/16/18		14.41	6.47
3-Th	5/17/18		14.96	6.68
3-F	5/18/18		14.55	6.65
3-Sa	5/19/18		14.72	6.63
4-Su	5/20/18		14.27	6.54
4-M	5/21/18		14.75	6.46
4-T	5/22/18	3	15.18	6.30
4-W	5/23/18		15.32	6.54
4-Th	5/24/18		15.22	6.70
4-F	5/25/18		14.96	6.50
4-Sa	5/26/18		14.75	6.34
5-Su	5/27/18		15.51	6.28
5-M	5/28/18		15.41	6.54
5-T	5/29/18	3	15.94	6.42
5-W	5/30/18		15.99	6.22
5-Th	5/31/18		15.84	6.36
Minimum				6.09
				>= 6.0 (RO)
Average			14.1794	
			Report Only	
Weekly Average				
Maximum				6.85
				<= 9.0 (RO)
Daily Maximum			15.99	
			Report Only	
Monthly geometric mean		1.93318		
		<= 200		
Weekly Geometric Mean		3		
		<= 400		

APPENDIX E

CLALLAM BAY/SEKIU
INFILTRATION AND INFLOW STUDY

CLALLAM COUNTY

WASHINGTON

CLALLAM BAY/SEKIU
INFILTRATION AND INFLOW STUDY

G&O #18486
OCTOBER 2018

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CLALLAM COUNTY

WASHINGTON

CLALLAM BAY/SEKIU INFILTRATION AND INFLOW STUDY

G&O #18486
OCTOBER 2018

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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CHAPTER 1

INTRODUCTION

PURPOSE AND SCOPE OF STUDY

Clallam County contracted Gray & Osborne to complete an infiltration and inflow (I/I) study of the Clallam Bay/Sekiu wastewater collection systems. This effort was driven, in part, by the compilation of the General Sewer Plan/Wastewater Facilities Plan.

The required I/I program is described in Section S4.E of the Sekiu NPDES Permit WA0024449 and of the Clallam Bay NPDES Permit WA0024431. This study will assist with addressing Items 1, 2, and 4:

> *S4.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 measureable infiltration and inflow.*
>
> 3. *The Permittee must prepare a report summarizing any measureable 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, 2015 and annually thereafter.*

Figures 1-1 and 1-2 show a map of the Sekiu and Clallam Bay wastewater collection systems. The wastewater collection systems consist of gravity sewer, force main, and sewer lift stations. Table 1-1 summarizes the sewer pipe inventory for both Sekiu and Clallam Bay.

The focus of the I/I study is the gravity sewer system because it is assumed that the force mains are pressurized or are sufficiently tight that they are not a source of I/I.

TABLE 1-1

Inventory of Sewer Pipe in Clallam Bay and Sekiu Wastewater Collection Systems

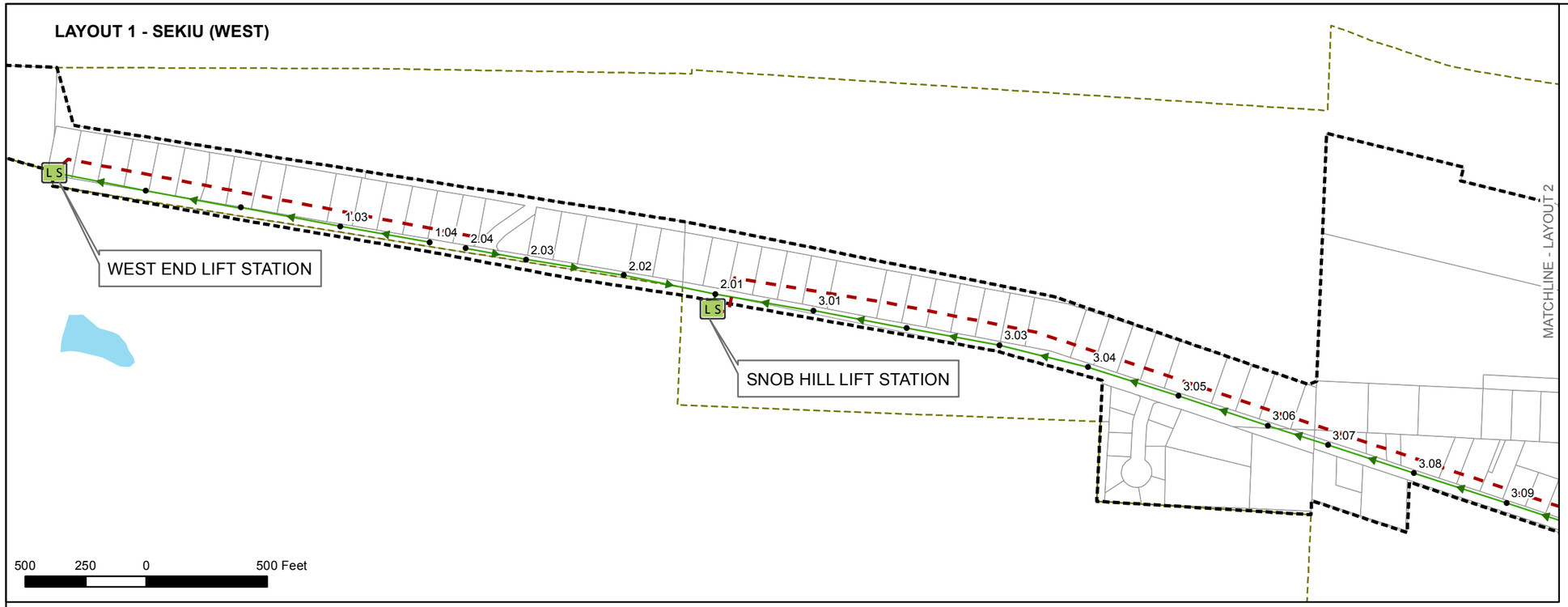
Pipe Diameter and Type	Sekiu Length (feet)	Clallam Bay Length (feet)
4-inch Force Main	1,895	390
6-inch Force Main	2,130	0
8-inch Force Main	5,010	2,770
8-inch Gravity	18,160	16,618
10-inch Gravity	0	1,652
Total	**27,195**	**21,430**

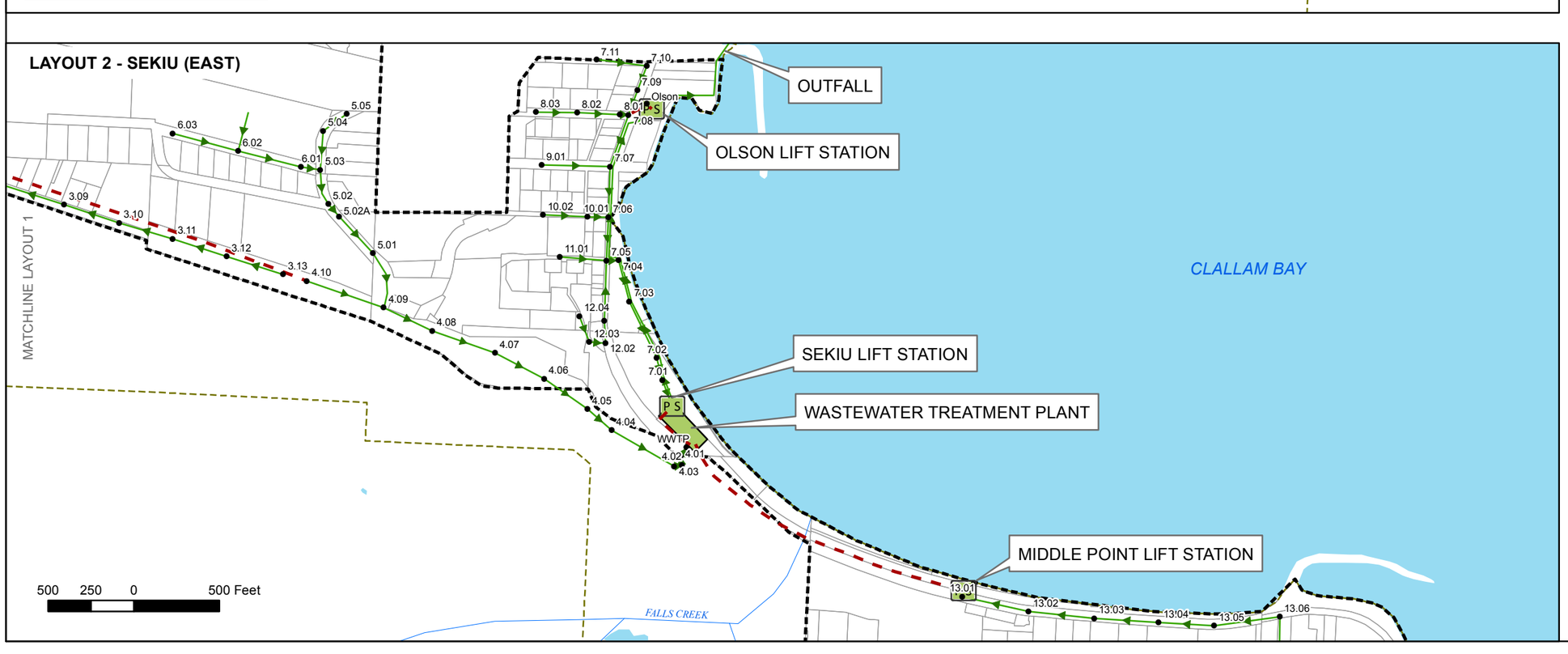
DEFINITION OF INFILTRATION AND INFLOW

Infiltration refers to water that enters a sewer system from the ground through defective pipe, pipe joints, damaged service laterals, or manhole walls. Infiltration is commonly related to high groundwater levels above sewer components, but is also influenced by storm events. Storm-related infiltration generally occurs in shallow wastewater collection system components, such as service laterals, in porous soils. Inflow refers to the discharge of water into sanitary sewers due to connections with building downspouts, yard drains, foundation drains, catch basins, and cross connections between storm and sanitary sewers. Inflow can be attributed to both direct and indirect causes. Direct inflow occurs as a result of stormwater runoff and has a short duration. Indirect inflow occurs from stormwater runoff through a medium such as soil before it enters the sanitary sewer.

It is common for wastewater entering a collection system to have some component of I/I. However, excessive I/I can cause adverse effects on wastewater collection and treatment facilities including:

- Surcharging of sewer manholes causing backups to the surface.
- Sewage backups in facilities with sewer service due to sewer transmission lines being too full to convey flows.
- Hydraulic overloading of unit processes at the wastewater treatment plant (WWTP).
- Reduced treatment efficiency at the WWTP.
- Prematurely reaching capacity for collection systems and/or WWTP components.





N

LEGEND

- SEWER MANHOLE
- FORCE MAIN
- SANITARY SEWER PIPE
- LIFT STATION
- WASTEWATER TREATMENT PLANT
- SEWER SERVICE AREA
- UGA BOUNDARY
- PARCEL
- WATERBODY

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 1-1
SEWER SYSTEM (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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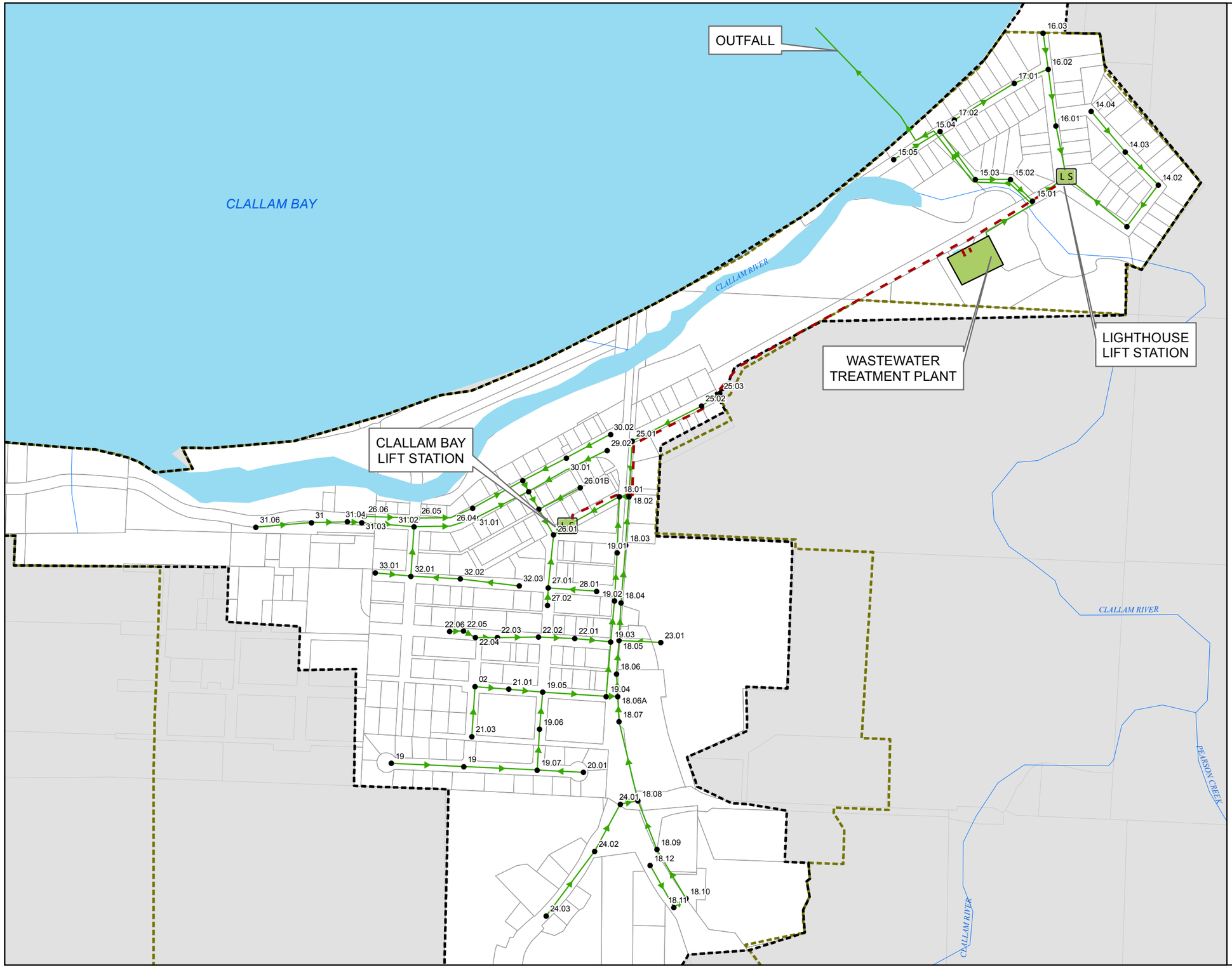


CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 1-2
SEWER SYSTEM (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\I and I study C_SERVICEAREA-.mxd

PREVIOUS I/I IDENTIFICATION AND REDUCTION WORK

In March 1990, the County released the report entitled *Infiltration/Inflow Analysis for Clallam Bay and Sekiu Utility Improvement District* as prepared by CWC-HDR, Inc. This report documented field studies which consisted of smoke testing, flow monitoring, review of WWTP and lift station records, gathering precipitation data, and manhole inspection. The report found that significant I/I was determined to exist within the Muralt's Trailer Park in Clallam Bay. Contributing sources within Sekiu included the Bayview Trailer and RV Park, Coho Resort, Middle Point Resort, and the reach along Front Street. The report provided recommendations for sewer repair and rehabilitation projects designed to remove or minimize I/I-related flows along with recommendations for additional work. This work included additional monitoring and closed-circuit television (CCTV) inspection. As of 2018, the previous recommendations for repairing and rehabilitating the systems have not been implemented.

OBJECTIVES OF REPORT

This report provides the results of an analysis that was conducted in 2018 to identify and characterize potential inflow or infiltration in the Clallam Bay and Sekiu sewer systems as well as make recommendations for reducing I/I in the most cost-effective manner that will meet the requirements stipulated in the County's NPDES permits as outlined above. The report is organized as follows:

Chapter 1 – Introduction
Chapter 2 – Flow Monitoring and Analysis
Chapter 3 – Smoke Testing
Chapter 4 – Manhole Inspection
Chapter 5 – Video Inspection
Chapter 6 – Results and Recommendations

This report is intended to meet the requirements of Section S4.E as stipulated in the NPDES permits.

CHAPTER 2

FLOW MONITORING AND ANALYSIS

This chapter presents an analysis of flows within the Clallam Bay and Sekiu collection systems in order to determine areas of excessive I/I. The analysis includes evaluation of pump station run time data and collection system flow monitoring data.

PUMP STATION RUN TIME DATA

Pump station run times are recorded manually on a daily basis for all of the pump stations within Sekiu and Clallam Bay. Table 2-1 and Figures 2-1 through 2-7 present peak day flows and dry weather winter flows for the pump stations based on run time data collected between March 2017 and February 2018. Since specific collection system flow metering was not completed year-round to calculate monthly averages, winter dry weather was used to calculate peaking factors.

With this data, it appears that all pump station records reflect upstream I/I issues. The greatest I/I volume was seen within the Sekiu Lift Station area which represents the downtown core of Sekiu along Front Street. Within Clallam Bay, the Clallam Bay Lift Station experienced the greatest increase in I/I volume.

It should be noted that daily pump station flows were calculated by multiplying the rated capacity for the pump station by the minutes of run time recorded for a selected date. A drawdown test was not completed for this analysis. Without an accurate pump capacity, exact lift station flows could not be calculated; however, the values in Table 2-1 help identify the proportion of I/I that comes from various regions in the Sekiu and Clallam Bay areas.

In observing the storm to dry weather ratios between the lift stations and the Sekiu WWTP, it appears that the portion of the gravity collection system that does not flow to a lift station (i.e., the Sekiu Airport Road area) is a likely source of I/I.

TABLE 2-1

Evaluation of Pump Station Flows for Inflow Peaking

	Basin (subbasin)	Units	Winter Storm Nov. 22, 2017	Winter Dry Dec. 24-28, 2017	Maximum I/I Measured[2]	Storm/ Dry Flow Ratio
Sekiu						
Daily WWTP Base Flow	All	gpd	134,000	38,000		--
Rainfall	All	in/day	1.27	0.0		--
Total Daily WWTP Flow[3]	All	gpd	426,000	38,000		11.2
Sekiu LS	Sekiu LS (Sek7)	gpd	213,600	52,560	161,040	4.1
Middle Point LS	Middle Point LS (Mid1)	gpd	83,160	17,064	66,096	4.9
Snob Hill LS	Snob Hill LS (Sh1)	gpd	120,600	32,400	88,200	3.7
West End LS	West End LS (We1)	gpd	24,900	11,100	13,800	2.2
Clallam Bay						
Daily WWTP Base Flow	All	gpd	55,000	31,600		--
Rainfall	All	avg. in/day	1.27	0.0		--
Total Daily WWTP Flow[3]	All	gpd	293,000	31,600		8.9
Clallam Bay LS	Clallam Bay LS (CB-West6)	gpd	121,800[1]	68,040	53,760	1.79
Lighthouse LS	Lighthouse LS (Light 3)	gpd	30,750	12,750	18,000	2.4

(1) Flow record not available on November 22, 2017, so data from November 23, 2017, was used.
(2) I/I measured represents the difference between the maximum winter storm flow minus the average winter dry flow.
(3) Flows were determined from the treatment plant Daily Monitoring Reports (DMRs). The "Winter Dry" flows were calculated by taking the average daily flow between December 24 and 28, 2017.

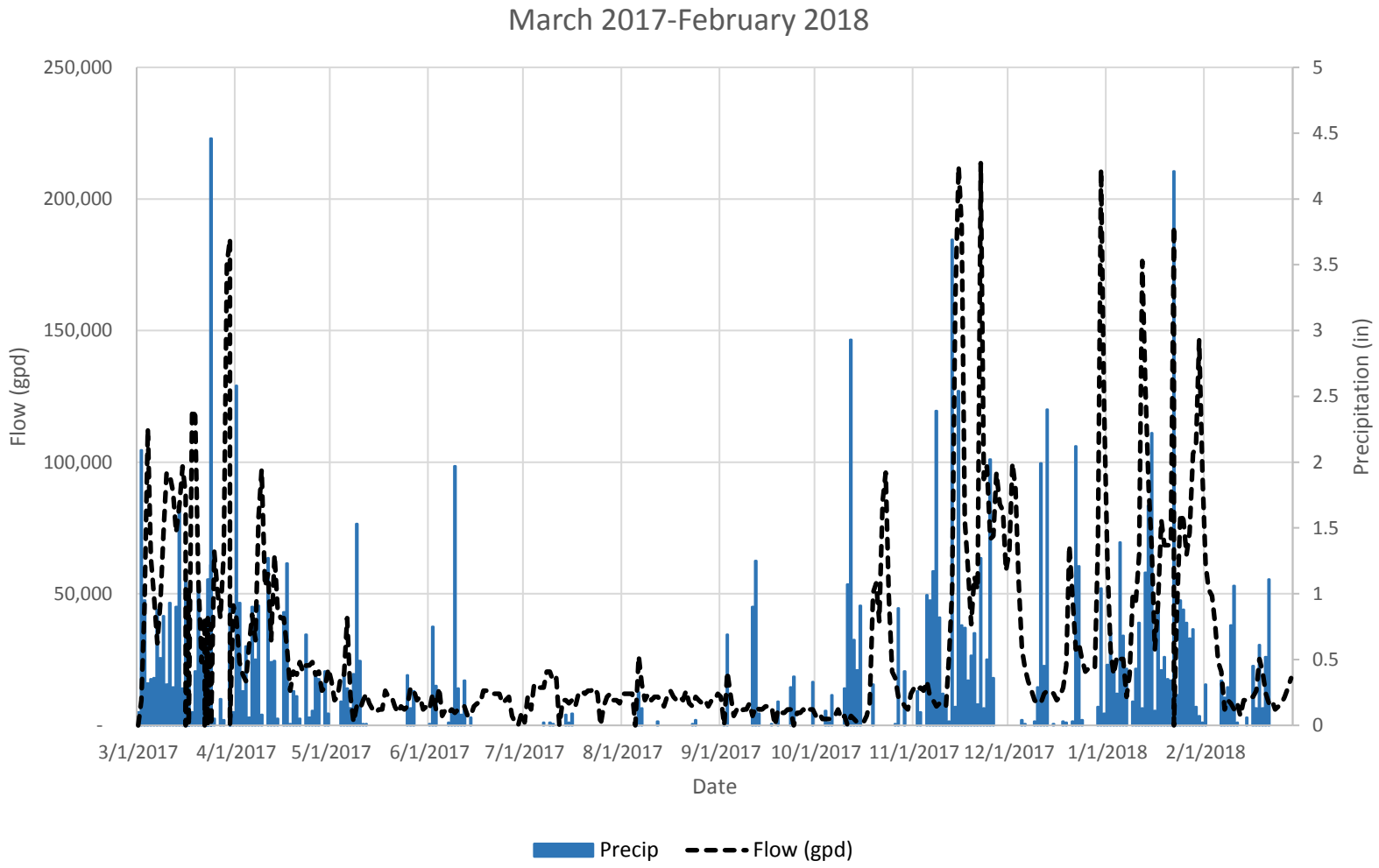


FIGURE 2-1

Sekiu Lift Station Flows

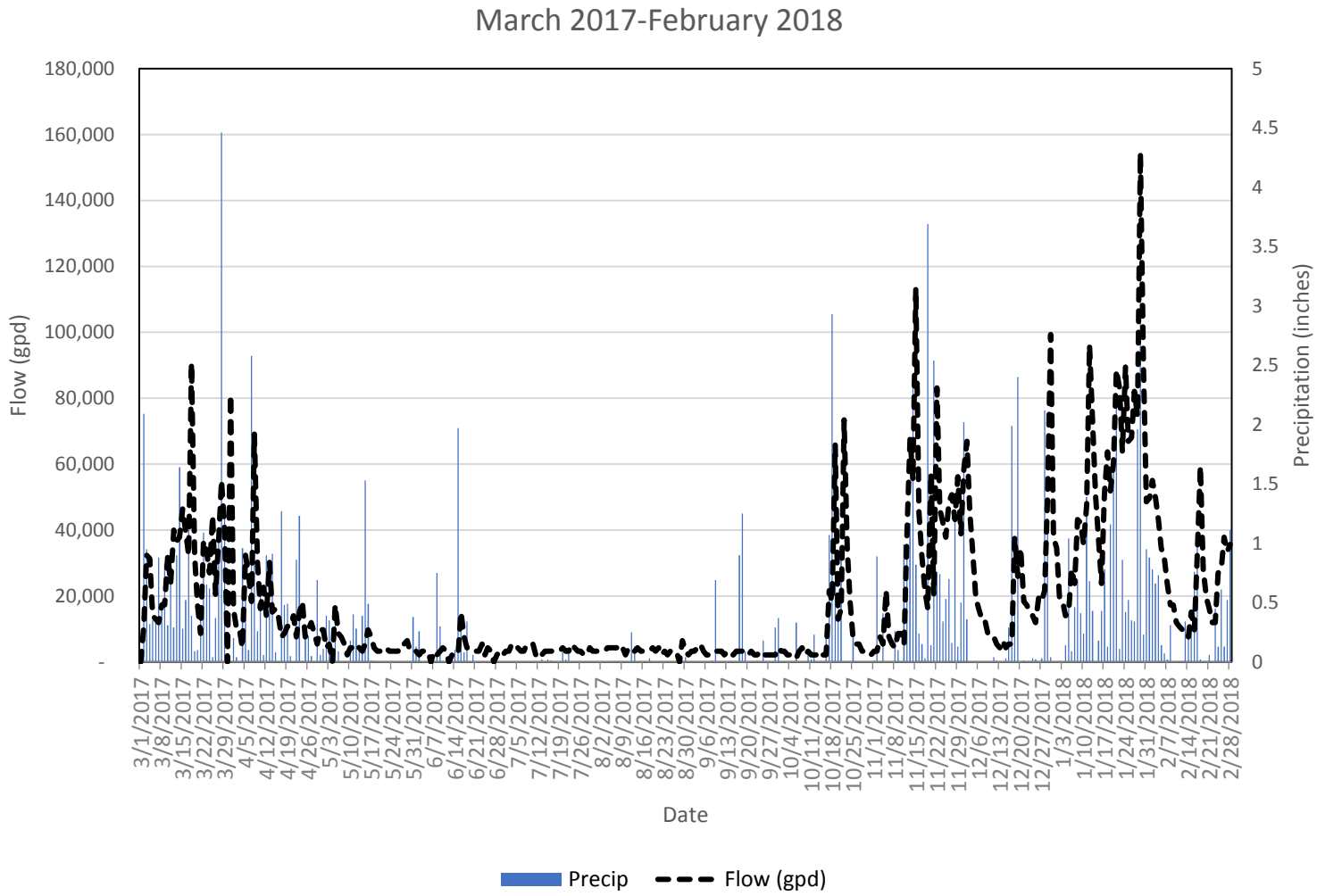


FIGURE 2-2

Middle Point Lift Station Flows

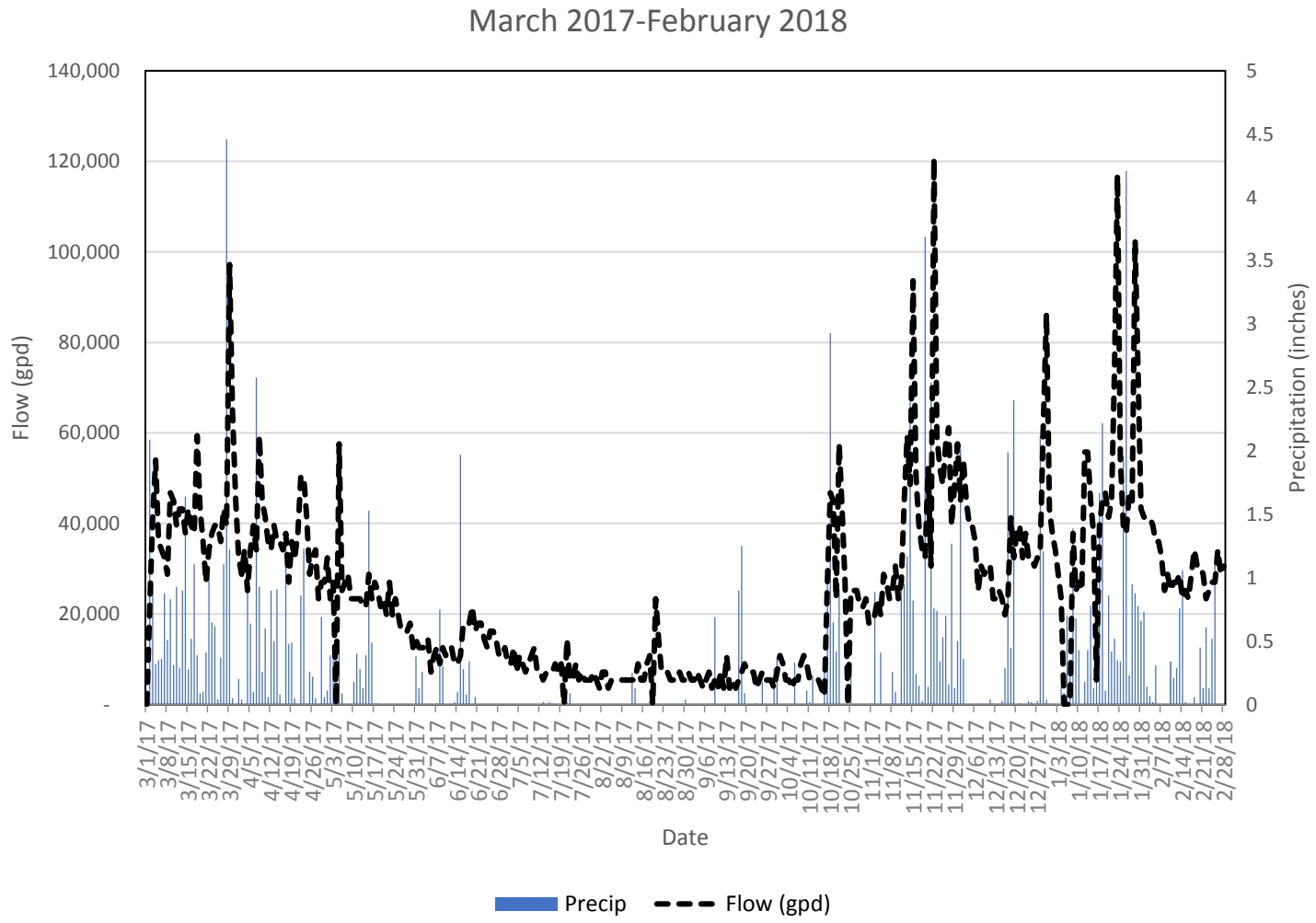


FIGURE 2-3

Snob Hill Lift Station Flows

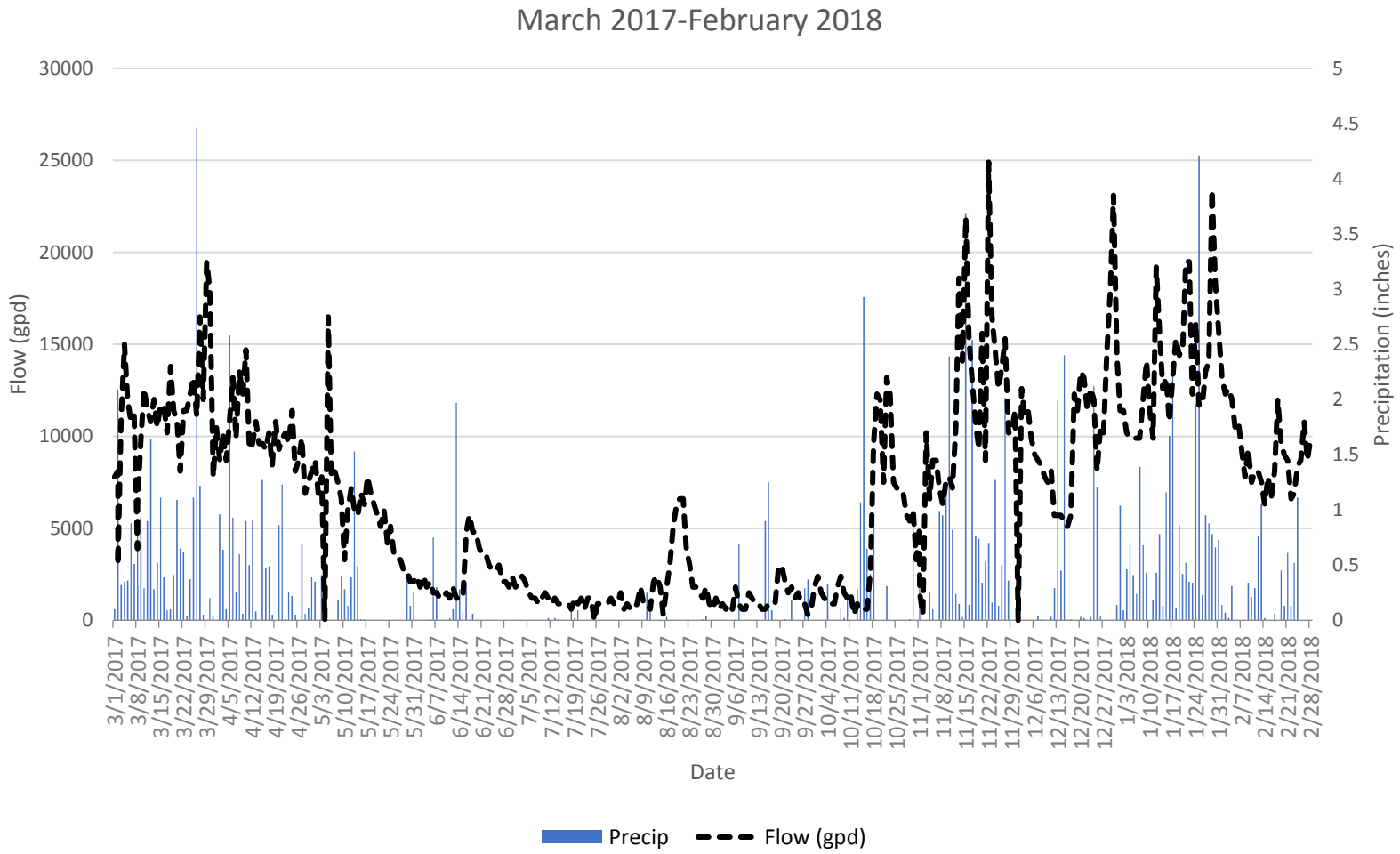


FIGURE 2-4

West End Lift Station Flows

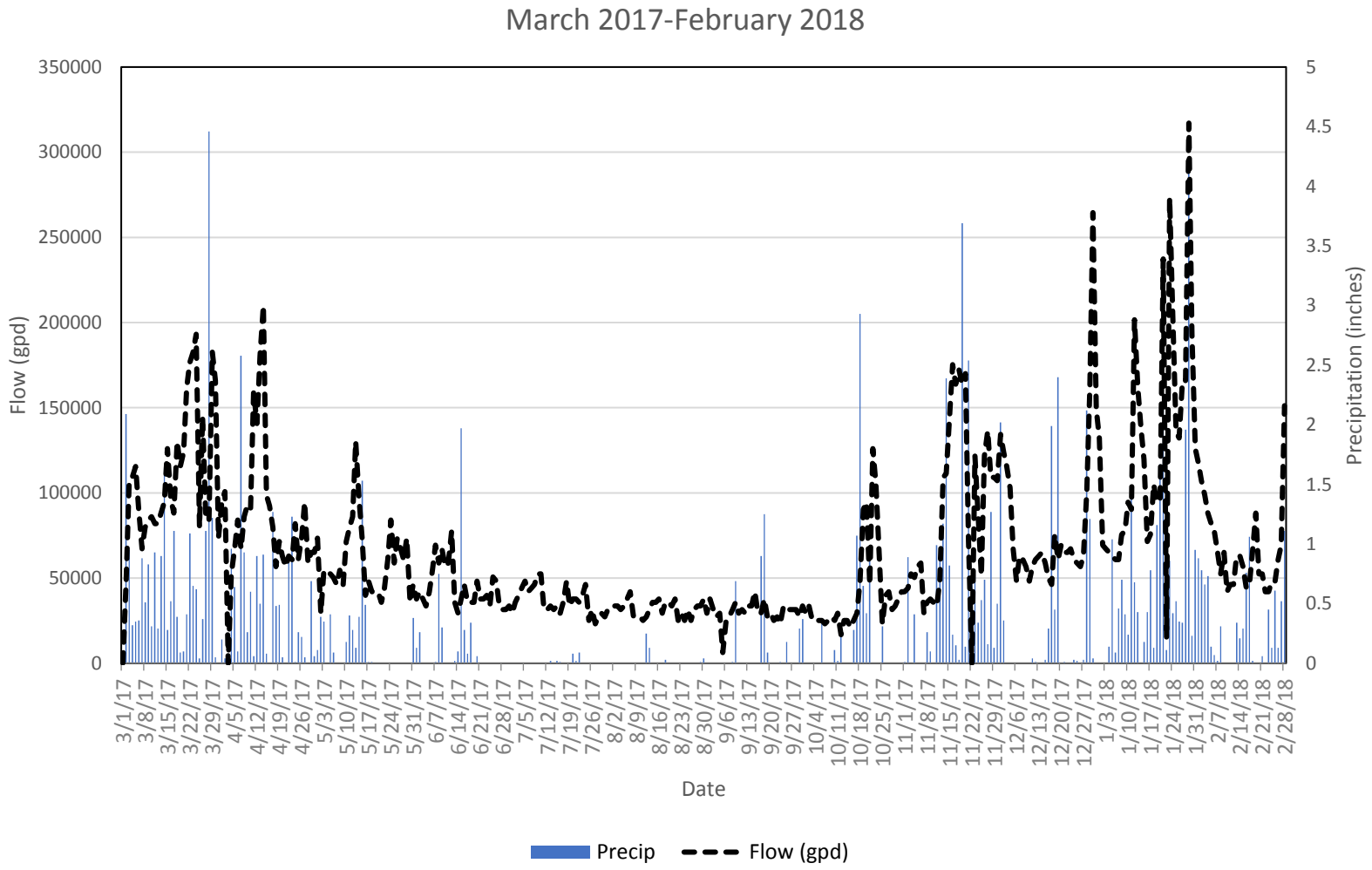


FIGURE 2-5

Clallam Bay Lift Station Flows

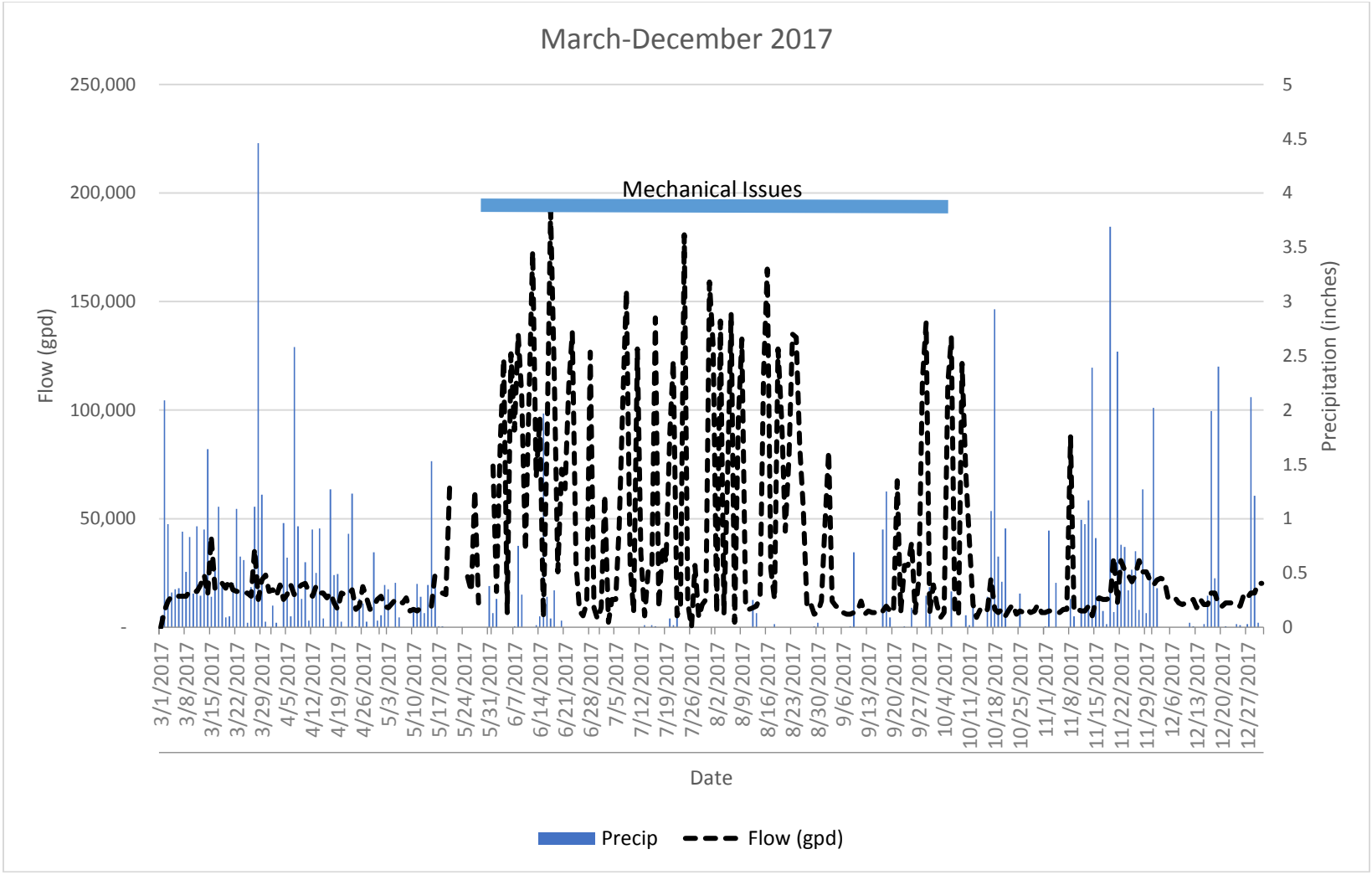


FIGURE 2-6

Lighthouse Lift Station Flows

FLOW MONITORING

Flow monitoring was conducted with portable flow monitors to determine the extent and general locations of I/I and areas that might warrant further investigation. For this I/I evaluation, three Hach FloDar/FL904 portable flow meters were installed within manholes in areas suspected of contributing excessive I/I. The flow monitors were installed in nine manholes for approximately 3 weeks at each location at various times from April 6 to June 5, 2018.

Daily average WWTP flows for the Clallam Bay WWTP during the period of flow monitoring ranged from 0.015 to 0.053 mgd, with an average of 0.026 mgd. Daily average WWTP flows for the Sekiu WWTP during the period of flow monitoring ranged from 0.014 to 0.232 mgd, with an average of 0.057 mgd.

The locations of the flow meters are indicated in Table 2-2 and are shown on Figure 2-7. Figures 2-8 through 2-16 show the flow meter data in graphical form. The full compilation of flow monitoring data is provided in Appendix A. Based on the data shown, the following can be concluded:

1. The greatest volume of I/I flows (~269 gpm) came from the Sekiu Airport Road Basin (Manhole 4.09).

2. The second greatest volume of I/I flows (~127 gpm) came from the area north of Manhole 7.03 located in the Van Riper's Resort region. This coincides with the pump station run time data from Table 2-1 that shows the Sekiu Lift Station as having the largest volume of I/I flows of all the lift stations monitored.

3. The Snob Hill and Middle Point Lift Station areas also have I/I issues although they do not appear to be as great as the Sekiu Airport Road Basin or the Sekiu Lift Station Basin.

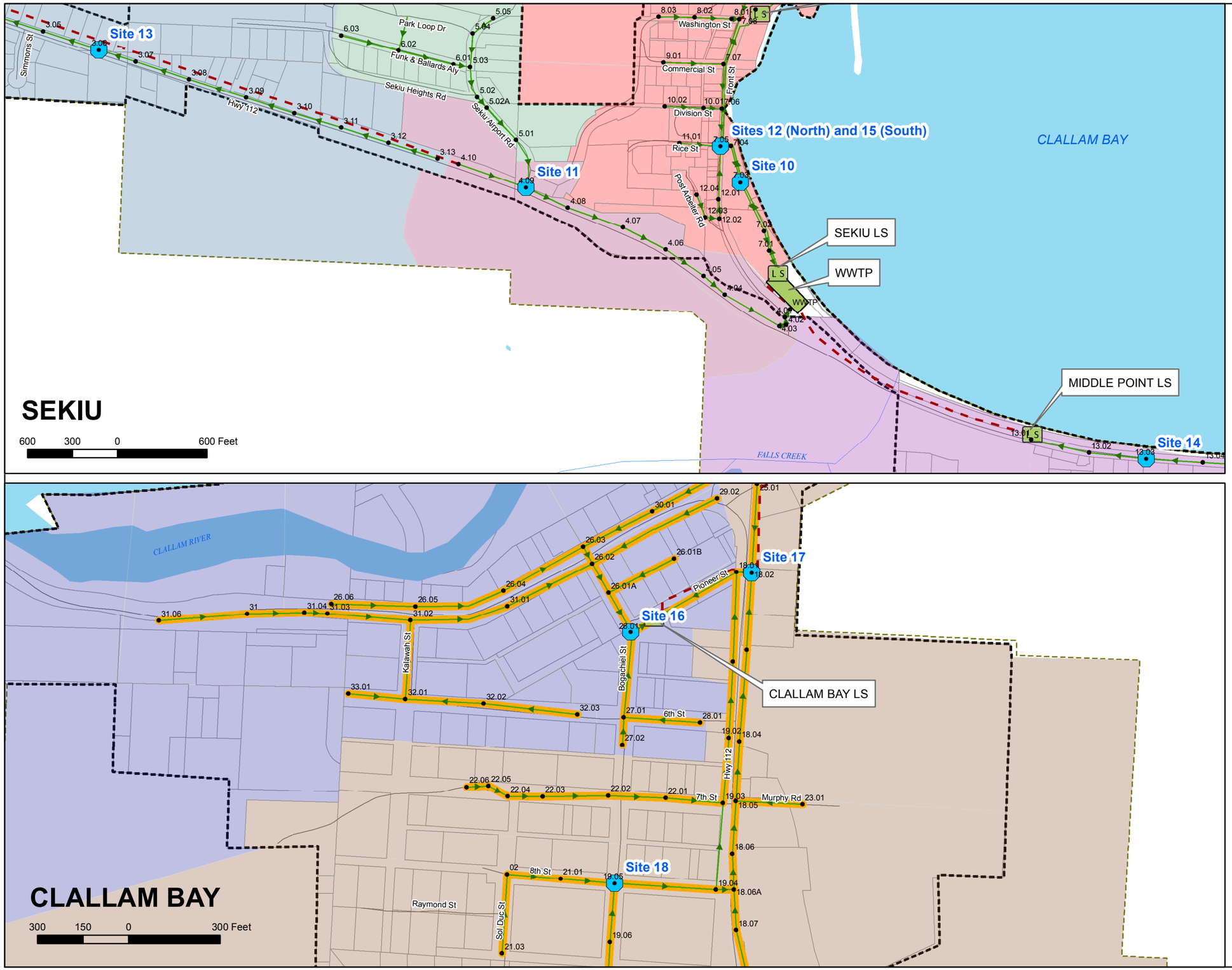
4. In general, from the pump station run time data and flow monitoring results, Sekiu appears to have more of an I/I issue than Clallam Bay. However, there was very little precipitation during the flow metering period for the Clallam Bay region. Therefore, a definitive conclusion on I/I issues cannot be drawn from the flow metering data alone and further investigation within Clallam Bay may be warranted.

TABLE 2-2

Collection System Flow Monitoring Data

Location	Manhole	Basin	Pump Station Tributary	Flow Meter Installed	Flow Meter Removed	Daily Flows			Ratio Inst. Max/Dry Weather	Daily Precip. (in)
						Avg Dry Day[(1)] (gpm)	Inst. Max[(2)] (gpm)	Max Daily (gpm)		
Site 10	7.03	Sekiu LS	Sekiu LS	04/06/18	04/23/18	15.2	142.7	59.0	9.4	2.18
Site 11	4.09	Sekiu Airport Road	—	04/06/18	04/23/18	9.1	278	103.0	30.7	2.18
Site 12	7.05	Sekiu LS	Sekiu LS	04/06/18	04/23/18	2.7	25.0	13.4	9.1	0.76
Site 13	3.06	Snob Hill LS	Snob Hill LS	04/24/18	05/11/18	9.2	13.8	9.5	1.5	0.11
Site 14	13.03	Middle Point LS	Middle Point LS	04/24/18	05/11/18	7.0	27.8	13.8	4.0	0.5
Site 15	7.05	Sekiu LS	Sekiu LS	04/24/18	05/11/18	7.1	(3)	(3)	(3)	—
Site 16	26.01	Clallam Bay West	Clallam Bay LS	05/11/18	06/05/18	10.7	(4)	(4)	(4)	—
Site 17	18.02	Clallam Bay East	Clallam Bay LS	05/11/18	06/05/18	8.7	(4)	(4)	(4)	—
Site 18	19.05	Clallam Bay East	Clallam Bay LS	05/11/18	06/05/18	7.3	(4)	(4)	(4)	—

(1) Average flow represents the average flow during a dry day throughout the flow monitoring period.
(2) Maximum flow represents the highest instantaneous flow during a precipitation event.
(3) Flow metering data was inconclusive.
(4) Metered flow during the small precipitation events that occurred June 1 through 5, 2018, was not higher than the typical flow seen the previous days.



N

LEGEND

- Flow Metering Location
- Sewer Manhole
- Force Main
- Sanitary Sewer Pipe
- Lift Station
- Wastewater Treatment Plant

Sewer Basin

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Highway 112
- Lighthouse LS
- Middle Point LS
- Sekiu Airport Rd
- Sekiu LS
- Snob Hill LS
- West End LS
- Sewer Service Area
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 2-7
FLOW MONITORING LOCATIONS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Flow Monitoring Locatoins.mxd

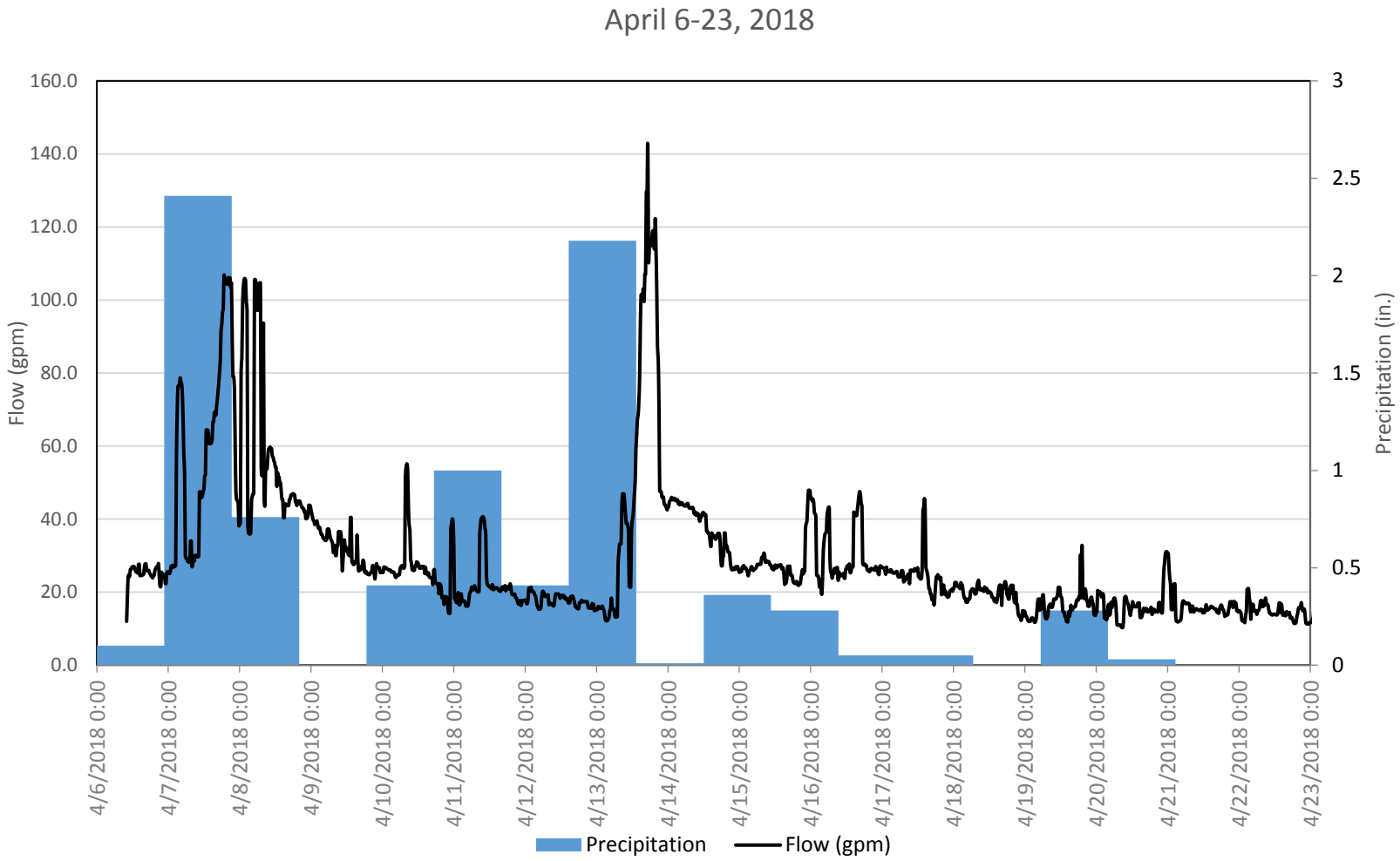


FIGURE 2-8

Site 10 (Sekiu Manhole 7.03) Metered Flows

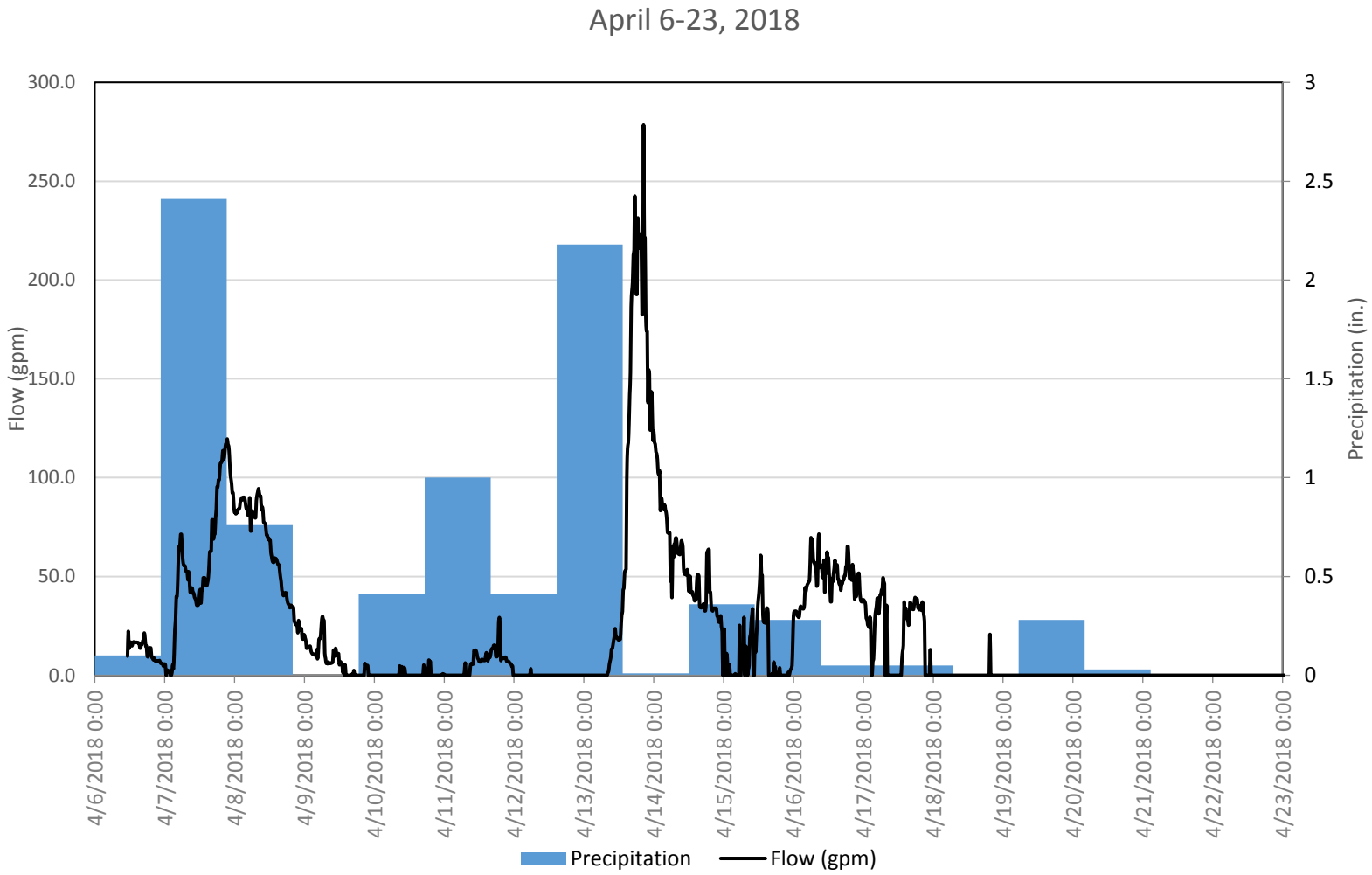


FIGURE 2-9

Site 11 (Sekiu Manhole 4.09) Metered Flows

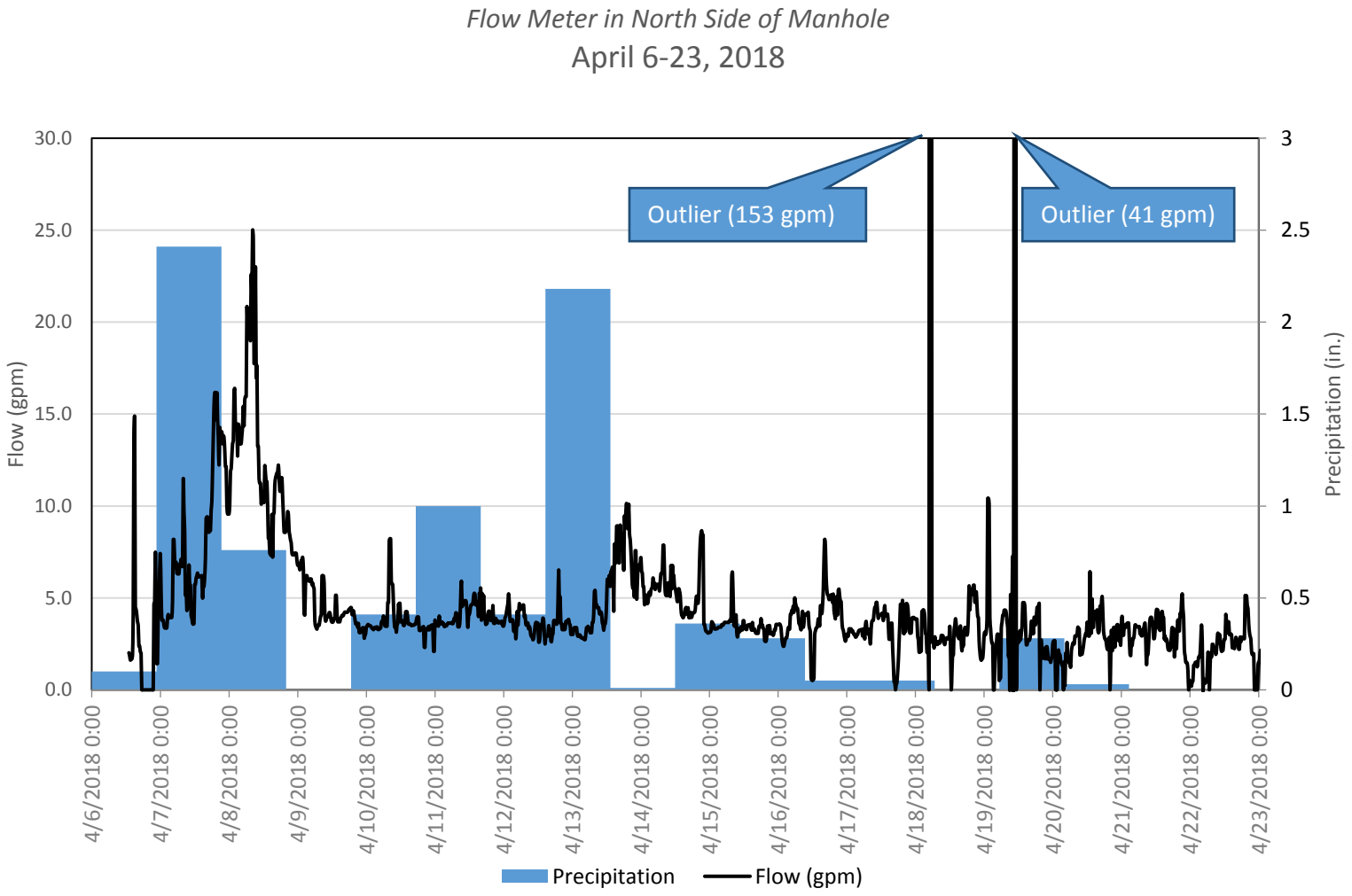


FIGURE 2-10

Site 12 (Sekiu Manhole 7.05) Metered Flows

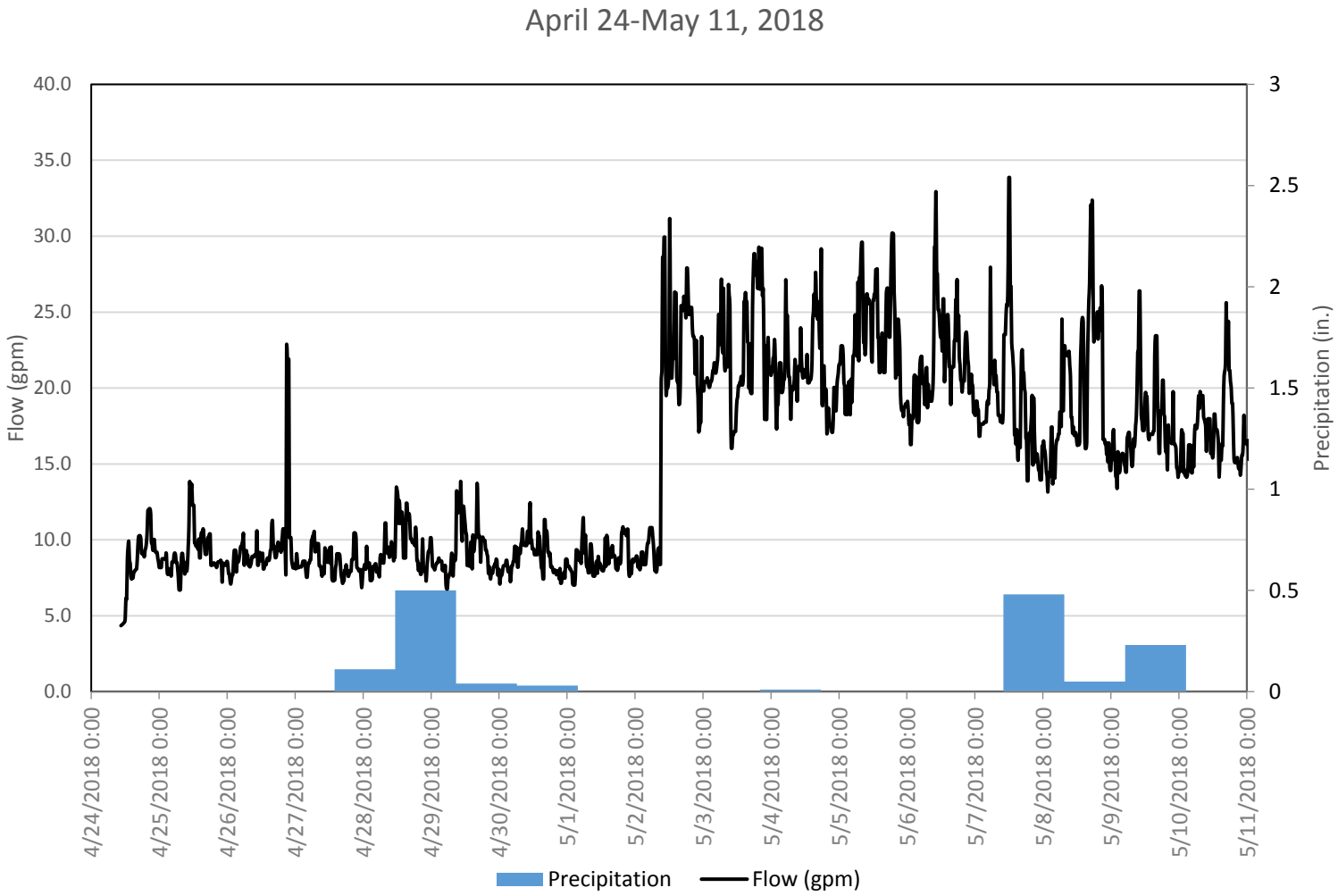


FIGURE 2-11

Site 13 (Sekiu Manhole 3.06) Metered Flows

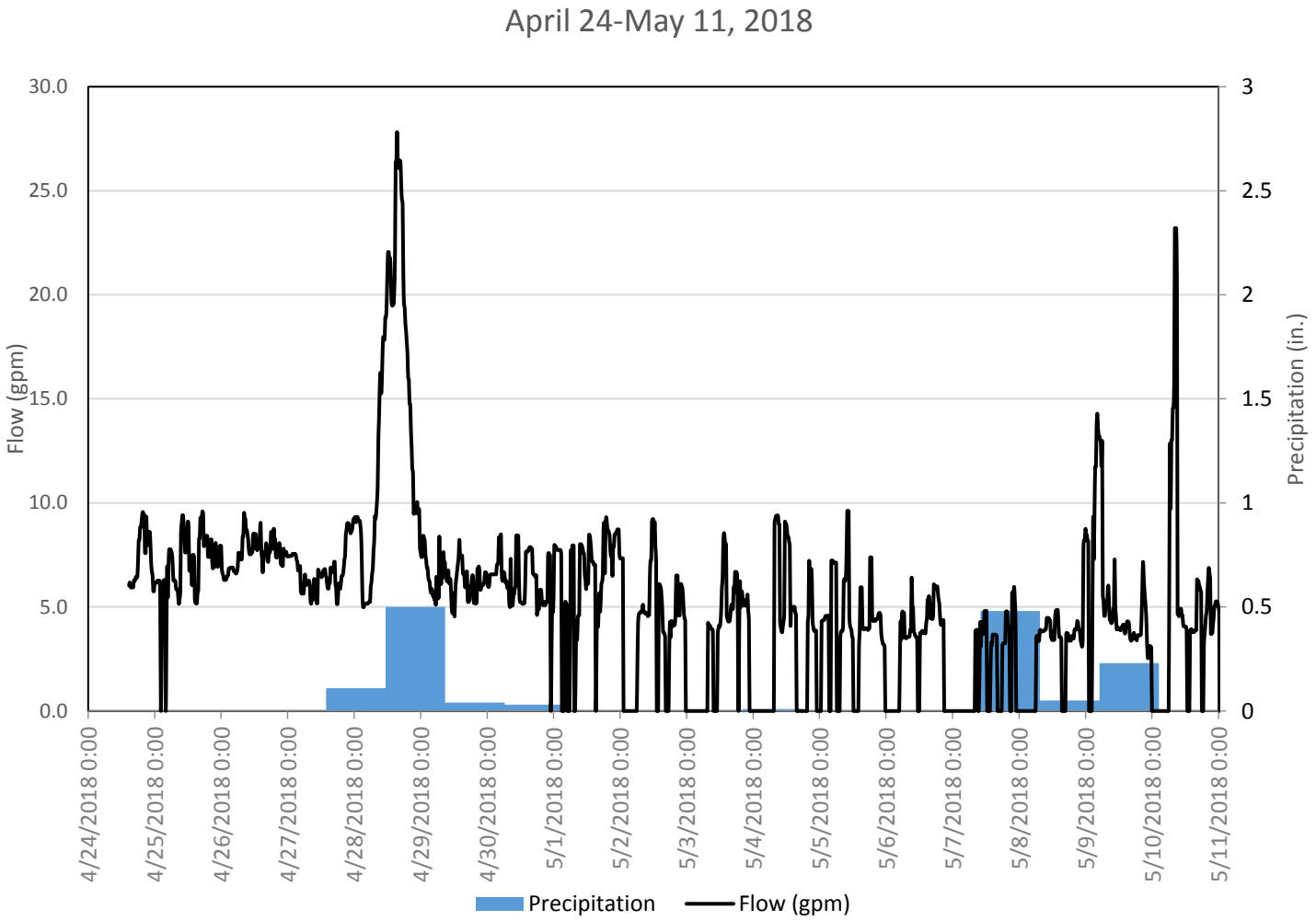


FIGURE 2-12

Site 14 (Sekiu Manhole 13.03) Metered Flows

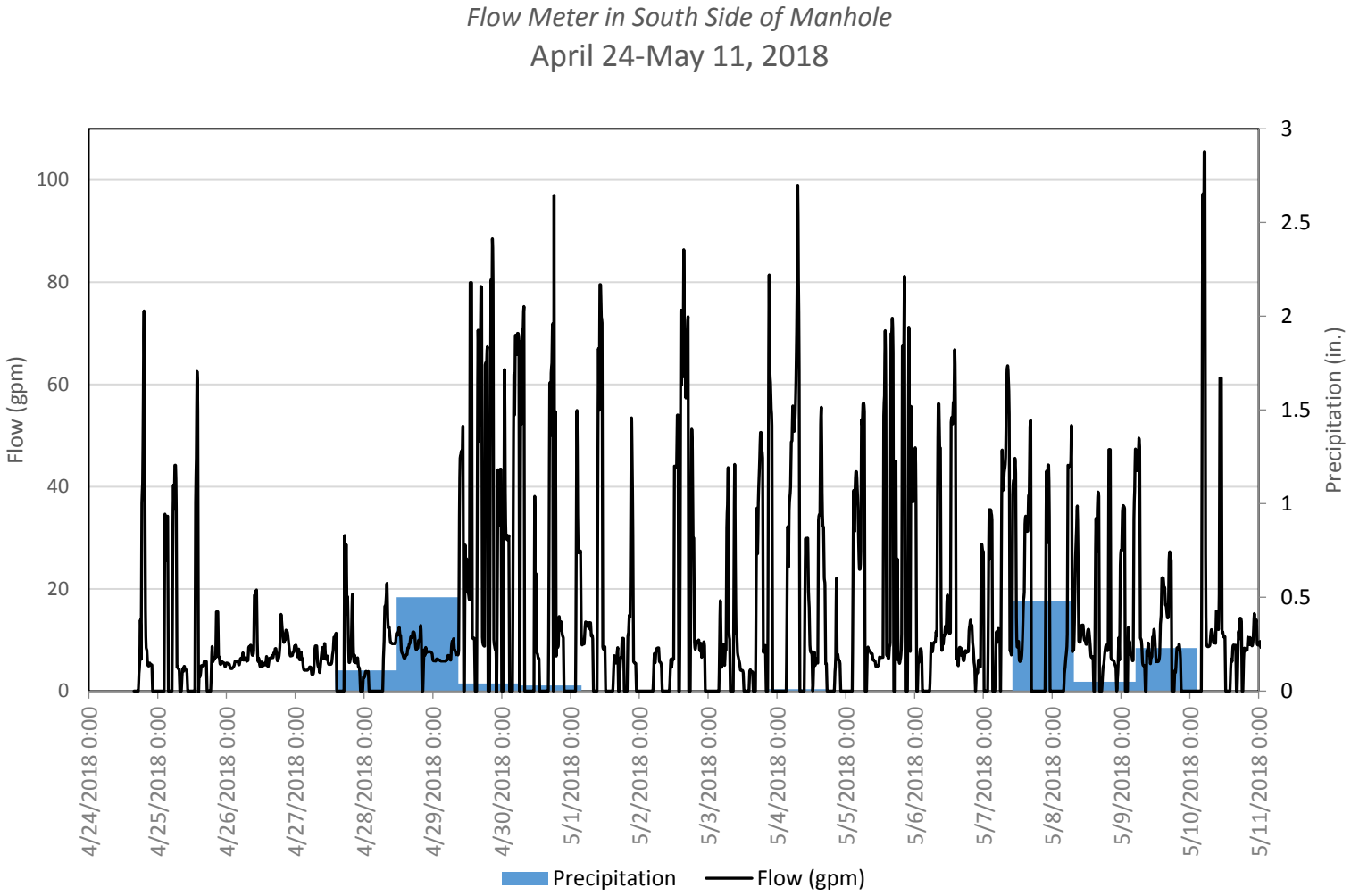


FIGURE 2-13

Site 15 (Sekiu Manhole 7.05) Metered Flows

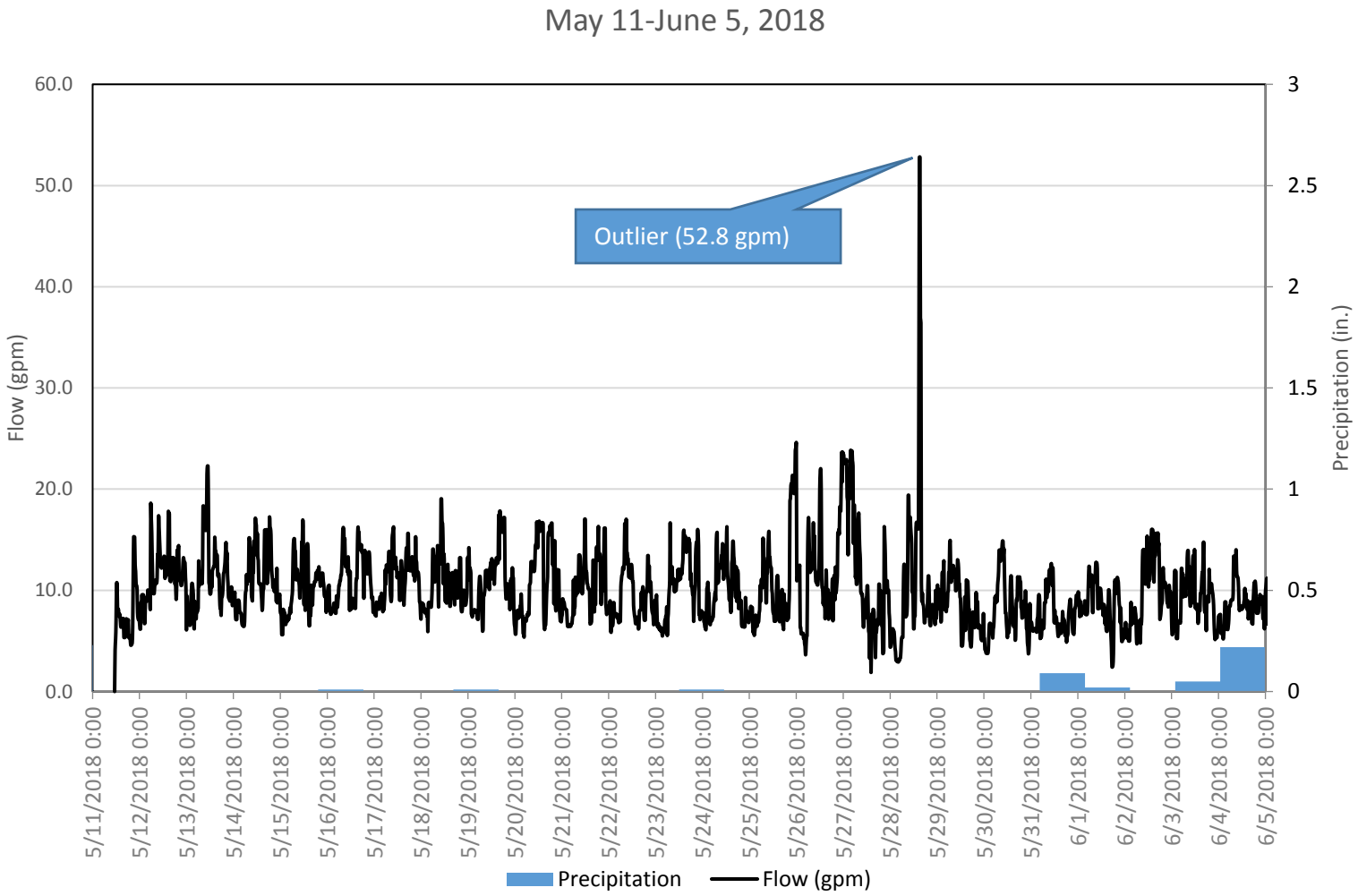


FIGURE 2-14

Site 16 (Clallam Bay Manhole 26.01) Metered Flows

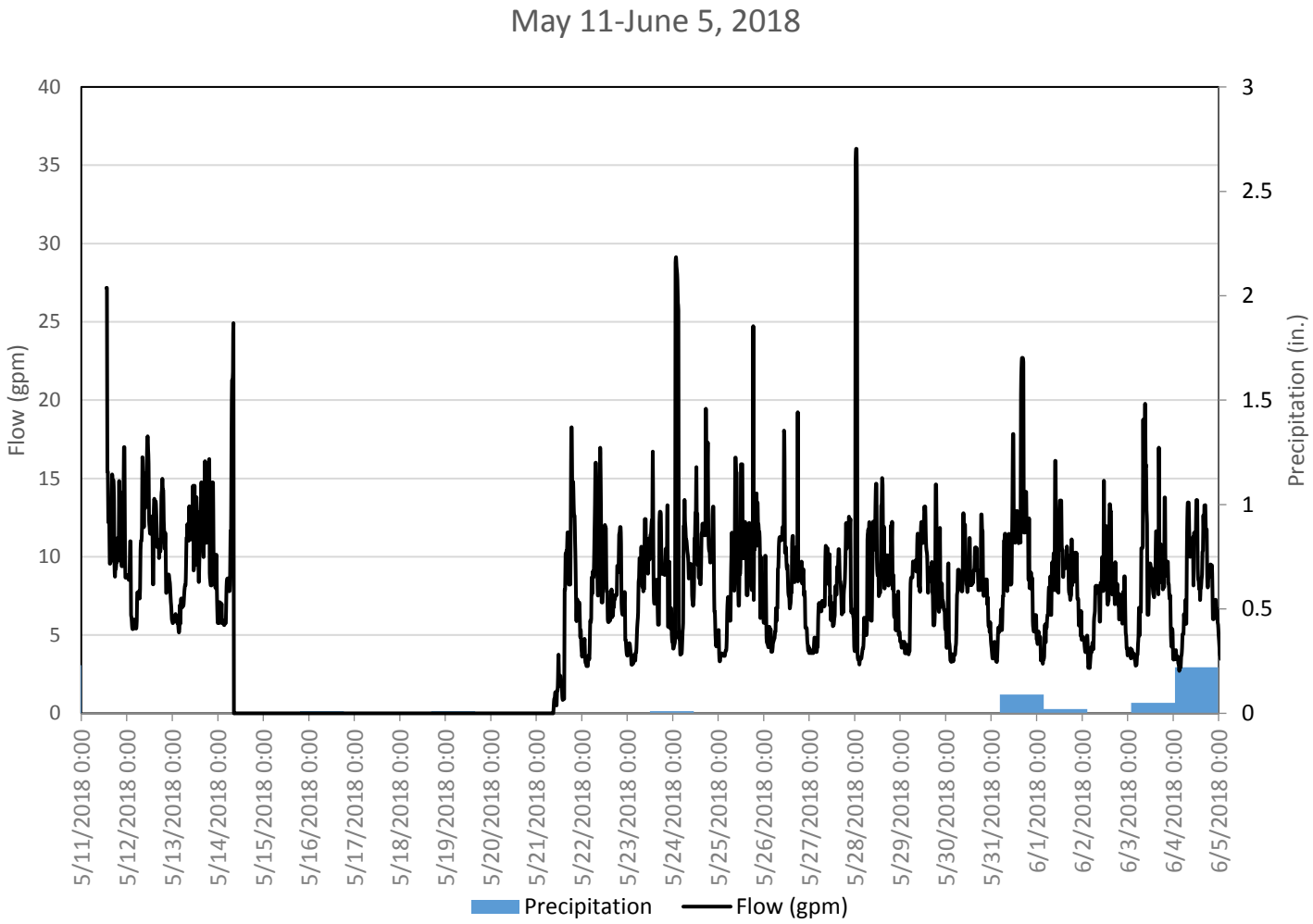


FIGURE 2-15

Site 17 (Clallam Bay Manhole 18.02) Metered Flows

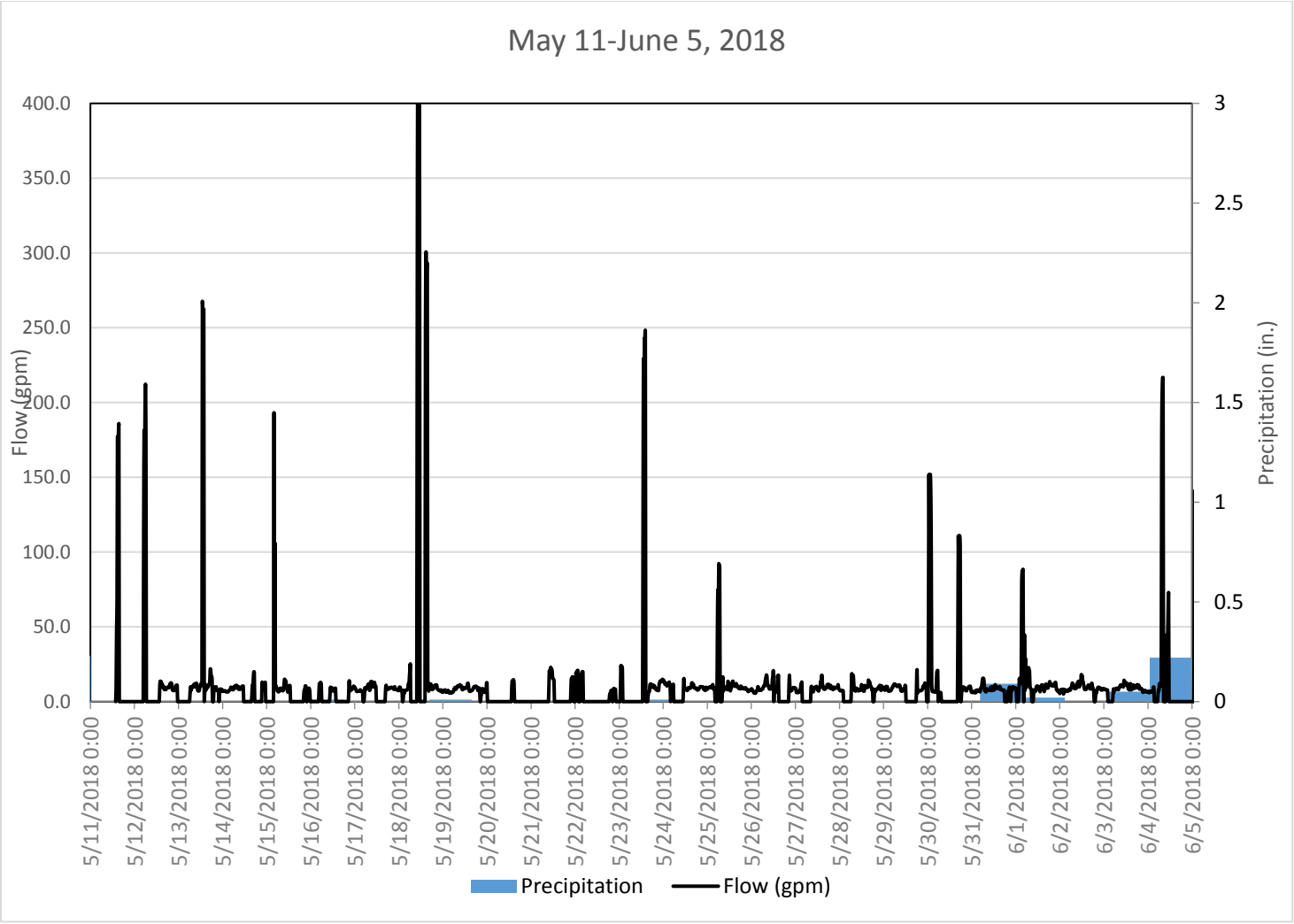


FIGURE 2-16

Site 18 (Clallam Bay Manhole 19.05) Metered Flows

CHAPTER 3

SMOKE TESTING

INTRODUCTION

Smoke testing is a typical means of conducting a physical assessment of a wastewater collection system. Smoke testing locates potential sources of I/I by blowing artificial smoke into the collection system, typically at a manhole, and visually observing where the smoke escapes. Visible smoke can indicate breaks in the collection system as well as cross connections between the sewer system and storm drain systems and roof drains. Smoke testing is a relatively quick way of ascertaining where in the collection system potential I/I sources exist and is normally used in conjunction with more precise means of locating I/I sources, such as CCTV inspection.

SMOKE TESTING

The discussion below summarizes the smoke testing approach and findings.

SMOKE TESTING APPROACH

Smoke testing of the Clallam Bay and Sekiu sewer systems was conducted from June 21 to 22, 2018. Figures 3-1 and 3-2 shows the areas that were smoke tested. As Figure 3-1 indicates, smoke testing was performed in all basins with gravity sewers with the exception of the West End Lift Station Basin and Highway 112 Basin in Sekiu.

Smoke testing consisted of the removal of manhole covers, use of a smoke machine to force liquid smoke into the system with a large fan placed over the lidless manhole casting, and visual observation of smoke released to the atmosphere from the sewer system in the tested area.

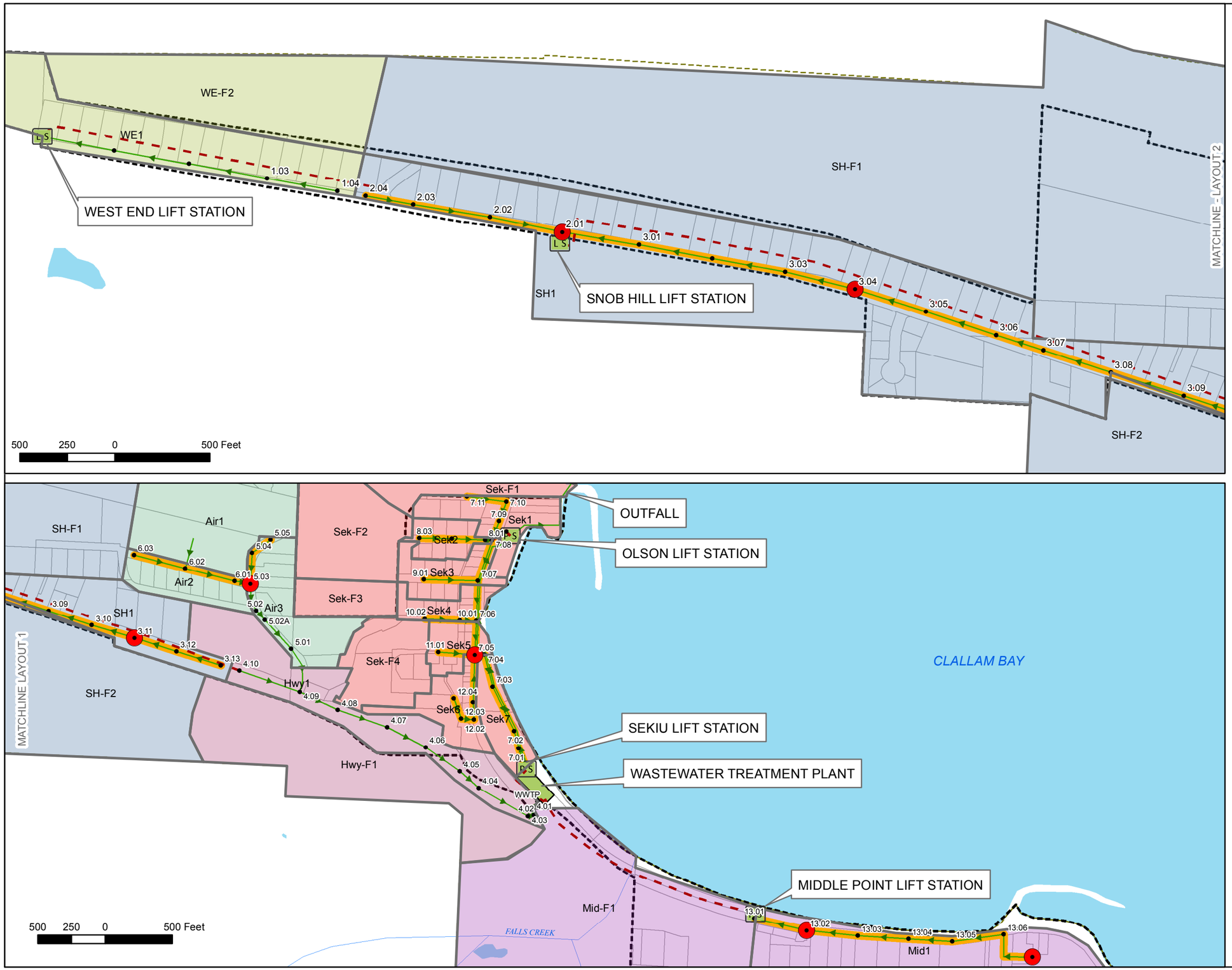
As summarized in Table 3-1, the testing covered approximately 137 acres within Sekiu and included 12,290 linear feet of gravity sanitary sewer mains serving 91 equivalent residential units (ERUs) during the winter season. This same region is anticipated to have upwards of 149 ERUs in the summer due to RV or hotel occupancy, especially during the fishing season.

TABLE 3-1

Sekiu Smoke Testing Area Statistics

Subbasin	Acres	Length of Gravity Pipe (linear feet)	Number of Winter ERUs	Number of Summer ERUs
Air1	32	410	4	33
Air2	6	890	9	9
Air3	9	410	3	3
Sek1	7	615	4	11
Sek2	3	545	3	3
Sek3	5	720	8	14
Sek4	3	680	13	13
Sek5	3	535	3	11
Sek6	5	740	3	6
Sek7	5	945	1	6
SH1	59	5,800	40	40
Total	**137**	**12,290**	**91**	**149**

For Clallam Bay, the testing covered approximately 167 acres and included 15,390 linear feet of gravity sanitary sewer mains serving 162 ERUs during the winter season. This same area is anticipated to have upwards of 165 ERUs in the summer.



N

LEGEND

- Smoke Insertion Points
- Smoke Tested Pipes
- Sewer Manhole
- Force Main
- Sanitary Sewer Pipe
- Lift Station
- Wastewater Treatment Plant
- Sewer Subbasin

Sewer Basin

- Highway 112
- Middle Point LS
- Sekiu Airport Rd
- Sekiu LS
- Snob Hill LS
- West End LS
- Sewer Service
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-1
AREAS SMOKE TESTED (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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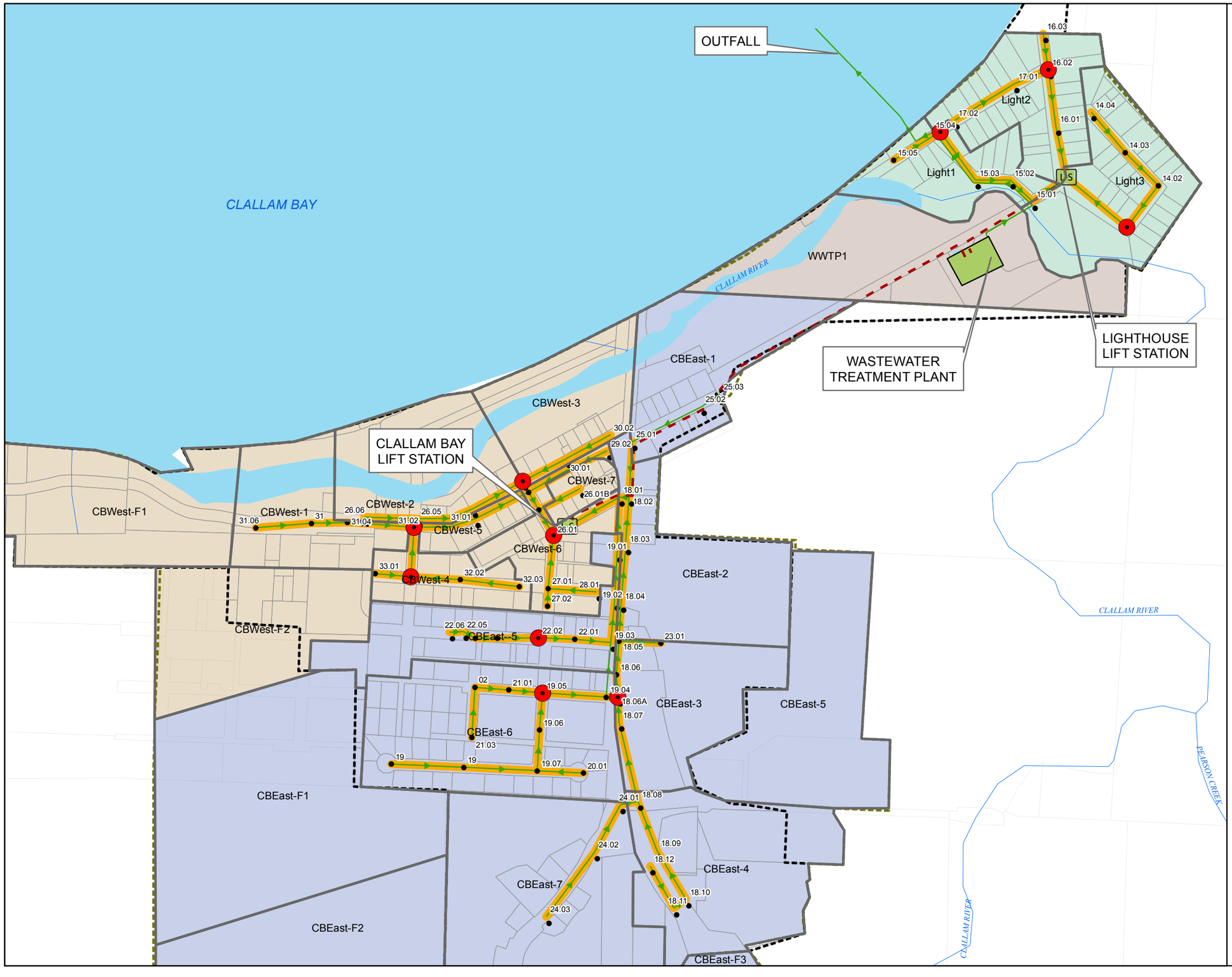

N

0 250 500 1,000 Feet

LEGEND

- Smoke Insertion Point
- Sewer Subbasin
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- LS — Lift Station
- Wastewater Treatment Plant

Sewer Basin

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Lighthouse LS
- Current Sewer Service Area
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-2
SMOKE TESTED AREA (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Figure Clallam.mxd

TABLE 3-2

Clallam Bay Smoke Testing Area Statistics

Subbasin	Acres	Length of Gravity Pipe (linear feet)	Number of Winter ERUs	Number of Summer ERUs
CBEast-2	14	980	5	1
CBEast-3	11	1,065	2	9
CBEast-4	17	890	16	16
CBEast-6	20	2,380	30	30
CBEast-7	27	810	3	3
CBWest-1	10	830	5	5
CBWest-2	12	850	9	9
CBWest-3	10	520	3	3
CBWest-4	5	1,010	6	6
CBWest-5	2	610	7	7
CBWest-6	7	1,780	4	4
CBWest-7	2	225	7	7
Light1	8	1,070	10	10
Light2	10	1,200	22	22
Light3	12	1,170	33	33
Total	**167**	**15,390**	**162**	**165**

SMOKE TESTING RESULTS

Figures 3-3 through 3-9 present the results of the smoke testing. These figures identify every point where staff members saw smoke which may not necessarily reflect an I/I source. In analyzing these locations, the testing revealed 32 locations where inflow could potentially enter the Clallam Bay collection system and 58 locations where inflow could potentially enter the Sekiu collection system. The combined 90 problem areas identified in the two regions included one area drain with direct connection to the sanitary sewer, 81 cleanouts that were either broken or without covers, and eight manholes. Table 3-3 summarizes the types of potential inflow locations that were discovered for both Clallam Bay and Sekiu.

TABLE 3-3

Results of 2018 Smoke Testing – Summary

Basin	Observed Sources of Smoke			
	Cleanouts	**Area Drains**	**Manholes**	**Total**
Clallam Bay				
Clallam Bay East	12	1	2	15
Clallam Bay West	13			13
Lighthouse Lift Station	4			4
Total (Clallam Bay)	**29**	**1**	**2**	**32**
Sekiu				
Sekiu Airport Road	15			15
Middle Point Lift Station	6		1	7
Sekiu Lift Station	25		1	26
Snob Hill Lift Station	6		4	10
Total (Sekiu)	**52**	**1**	**6**	**58**

Methodology for Estimating Inflow Quantities

A generic hydrologic analysis was performed to quantify the potential inflow for each of the identified potential I/I sources. The analysis was conducted based on the Western Washington Hydrology Model (WWHM 2012) along with estimated areas being drained to the inflow source. To determine runoff quantities, a 1-acre parcel was modeled in WWHM for the general Clallam Bay/Sekiu area. The runoff produced during a 100-year storm was determined by WWHM and then proportioned down to a per square foot surface area (i.e., 0.11 cubic feet of runoff per square foot of contributing drainage area). This volume of runoff was then applied to the estimated square footage of runoff draining to the area of interest. Specifically, areas used to estimate inflow quantities were estimated as follows:

- For cleanouts located below ground level within a grassy region ("G"), contributing areas were estimated based on the area likely to drain into the cleanout. Runoff from this area was estimated by the WWHM model to be 0.11 cubic feet per square foot per day of area draining to the cleanout (or 0.82 gpd per contributing sf).

- For cleanouts located in pavement ("I"), contributing areas were estimated based on the area likely to drain into the cleanout. Runoff from this area was estimated by the WWHM model to be 0.45 cubic feet per square foot per day of area draining to the cleanout (or 3.37 gpd per sf).

- For cleanouts above ground level, contributing inflow areas were determined based on the diameter of the cleanout.

CBWest-1
CBWest-2
CBWest-3
CBWest-4
CBWest-5
CBWest-6
CBWest-7
CBEast--5
CBEast-1
CBEast-2
CBEast-3
CBEast-5
CBEast-6
CLALLAM BAY LIFT STATION
L S
Pioneer St
Kalawah St
6th St
7th St
8th St
Frontier St
Hwy 112
Murphy Rd
Raymond St
Sol Duc St
Bogachiel St
W Kellogg St
E Kellogg St
31.06
31
31.04
31.03
26.06
26.05
31.02
31.01
26.04
26.03
26.02
26.01
26.01A
26.01B
30.01
30.02
29.02
25.01
18.01
18.02
18.03
19.01
18.04
19.02
18.05
19.03
18.06
18.06A
19.04
19.05
19.06
19.07
32.01
32.02
32.03
33.01
27.01
27.02
28.01
22.01
22.02
22.03
22.04
22.05
22.06
21.01
21.03
02
19
20.01
23.01
18.07
58
59
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74
101
73
72
107
97
98
99
100
65
36
102
61
39
37
38
105
103
106
104
40
111

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- CBEast--5
- CBEast-1
- CBEast-2
- CBEast-3
- CBEast-4
- CBEast-5
- CBEast-6
- CBEast-7
- CBWest-1
- CBWest-2
- CBWest-3
- CBWest-4
- CBWest-5
- CBWest-6
- CBWest-7
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

0 100 200 400 Feet

N

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-3
SMOKE TESTING RESULTS
(CB East and CB West Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Results Fig CB East.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Light1
- Light2
- Light3
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 60 120 240 Feet

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-4
SMOKE TESTING RESULTS
(Lighthouse Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Results Fig Lighthouse.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Air1
- Air2
- Air3
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 50 100 200 Feet

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-5
SMOKE TESTING RESULTS
(Airport Rd Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Results Fig Airport.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Mid1
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 87.5 175 350 Feet

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-6
SMOKE TESTING RESULTS
(Middle Point LS Subbasin)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Results Fig Middle Pt.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Sek2
- Sek3
- Sek-F1
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 30 60 120 Feet

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-7
SMOKE TESTING RESULTS
(Sek2, Sek3, Sek-F1 Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Results Fig Sekiu North.mxd

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- Sek6
- Sek5
- Sek4
- Sek-F4
- Sek7
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 30 60 120 Feet

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-8
SMOKE TESTING RESULTS
(Sek5, Sek6, Sek7, Sek-F4 Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Results Fig Sekiu South.mxd

SH-F1

SH1

SNOB-HILL PUMP STATION

L S

Simmons St

Hwy 112

Funk & Ballards Aly

Amy's Loop Ln

Park Loop Dr

Sekiu Airport Rd

Sekiu Heights Rd

14 83 84 49 48 85 15 13 86 89 91 88 90 9 8 7 6 47

2.02 2.01 3.01 3.03 3.04 3.05 3.06 3.07 3.08 3.09 3.10 3.11 3.12 6.03 6.02

LEGEND

Potential Inflow Source (Smoke Visible)

- Area Drain
- Cleanout
- Manhole
- Pipe
- Vent
- Smoke Insertion Point

Subbasin

- SH-F1
- SH1
- Smoke Tested Pipes
- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel

N

0 195 390 780 Feet

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 3-9
SMOKE TESTING RESULTS
(SH1, SH-F1 Subbasins)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Results Fig Sekiu Snob Hill.mxd

- For the Snob Hill Lift Station Basin manholes, an estimated 3-inch-diameter hole was discovered in the cones of the manholes along Highway 112, east of the lift station. Assuming that flow from the ditch reaches to a high level, the orifice equation ($Q = CA\sqrt{2gh}$), was used to calculate the anticipated flow through a 3-inch-diameter hole assuming 2 inches of head (i.e., the ditch fills to 2 inches higher than the hole). The results of these calculations are discussed below.

Smoke Testing Results

Tables 3-4 and 3-5 summarize the smoke testing results including the reference number, descriptions, potential sources of inflow, a category breakdown, and an estimated amount of potential inflow that could occur at this location. Figures 3-3 through 3-9 label the reference numbers whereas Appendix B contains the pictures taken during the investigation. In addition, the original field forms and maps are located in Appendix C.

Through sources identified from the smoke testing results, approximately 3,700 gpd of inflow is anticipated in the Clallam Bay area during a large storm event (see Table 3-4). The majority of this is likely due to an open area drain in the school parking lot within the Clallam Bay East Lift Station Basin (reference number 107 in Subbasin CBEast-2).

As shown in Table 3-5, a significant amount of inflow estimated at approximately 245,000 gpd (or 170 gpm) was estimated to occur from the Sekiu region during a large storm event per sources identified from the smoke testing results. The majority of this flow is anticipated to enter the sewer system through holes located in the sides of the manholes in the Snob Hill Lift Station Basin (reference numbers 13, 15, 47, and 48 in Subbasin SH-1). However, this assumes that the adjacent roadside ditch fills high enough for water to enter these holes.

TABLE 3-4

Results of 2018 Smoke Testing – Clallam Bay

Subbasin	Reference No.[1]	Photo| Reference[2]	Description	Potential Source of Inflow	Category	Type	Est. Surface Area (sf)	Est. Peak Inflow (cf/day)	Est. Peak Inflow (gpd)
CBEast-1	**111**	K28	Broken pipe at east wall of Clallam Bay Inn	Surface	Cleanout	G	8	1	7
CBEast-2	**107**	CB14 (2)	Open drain hole, acting like a catch basin in parking lot	Surface	Area Drain	I	1,000	450	3,366
CBEast-3	**38**	No photo	Missing cap	Ground	Cleanout	G	16	2	13
CBEast-3	**37**	AJ52	Smoke from under sidewalk near manhole, cracked manhole?	Ground	Manhole	G	2	0	2
CBEast-5	**72**	CB9	Open pipe at library, weak cleanout cover	Surface	Cleanout	I	0	0	0
CBEast-5	**73**	CB8	Vacant lot, open cleanout	Surface	Cleanout	G	16	2	13
CBEast-5	**74**	No photo	Open pipe	Surface	Cleanout	G	2	0	2
CBEast-5	**98**	CB4	Broken cleanout	Surface	Cleanout	G	16	2	13
CBEast-5	**99**	CB6	Leaky hookup	Surface	Cleanout	G	16	2	13
CBEast-5	**100**	CB7	Broken cleanout	Surface	Cleanout	G	16	2	13
CBEast-5	**101**	No photo	Smoke under berry bush, broken cleanout?	Surface	Cleanout	G	16	2	13
CBEast-5	**102**	No photo	Smoke under covered porch	None (covered)	Cleanout	—	—	—	—
CBEast-5	**36**	AJ50	Open concrete pipe	Surface	Pipe	G	20	2	16
CBEast-5	**65**	SC3a	Vent on side of building? Could not locate	None (likely poor venting)	Vent	—	—	—	—
CBEast-6	**103**	CB13	Laundromat (homemade wood cover)	Surface	Cleanout	G	16	2	13
CBEast-6	**105**	CB12	Broken cleanout under trailer	Surface	Cleanout	G	0	0	0
CBEast-6	**106**	CB11	Broken cleanout?	Surface	Cleanout	G	16	2	13
CBEast-6	**104**	CB10	Private manhole, possible structural cracks?	Ground	Manhole	G	2	0	2
CBEast-6	**39**	No photo	Smoke under cover	None (likely poor ventilation)	Vent	—	—	—	—
CBEast-6	**40**	AJ51	Smoke from under house, overgrown	None (likely poor ventilation)	Vent	—	—	—	—
CBEast-6	**61**	SC4a	Uncapped open black vent pipe under roof	None (covered)	Vent	—	—	—	—
CBWest-1	**59**	No photo	Floor drain covered	None (covered)	Area Drain	—	—	—	—
CBWest-1	**77**	No photo	Possible broken pipe at side of fish cannery	Surface	Cleanout	G	8	1	7
CBWest-1	**58**	No photo	Under door/roof	None (covered)	Vent	—	—	—	—
CBWest-2	**31**	No photo	Broken cap on west side of house (Address 16593 Hwy 112)	Surface	Cleanout	G	16	2	13
CBWest-2	**32**	AJ45	Open pipe or cleanout	Surface	Cleanout	G	16	2	13
CBWest-2	**33**	AJ46	Smoke coming out of ground, cleanout?	Surface	Cleanout	G	16	2	13
CBWest-2	**75**	K20	RV cleanout no cap, below grade	Surface	Cleanout	G	16	2	13
CBWest-2	**76**	K21	Broken cap on west side of house	Surface	Cleanout	G	8	1	7
CBWest-4	**63**	AJ48, k24	Uncapped cleanout under building	Surface	Cleanout	G	16	2	13
CBWest-4	**62**	SC2a, AJ49	Smoke under building	None (likely poor venting)	Vent	—	—	—	—
CBWest-5	**34**	AJ44	Smoke coming out of crawlspace	None (likely poor ventilation)	Vent	—	—	—	—
CBWest-6	**35**	AJ47	Smoke from pipe just under grass, likely a cleanout	Surface	Cleanout	G	16	2	13
CBWest-6	**64**	SC1a	Uncapped cleanout	Surface	Cleanout	G	16	2	13
CBWest-6	**95**	No photo	Old sewer dump for RVs	Surface	Cleanout	G	8	1	7
CBWest-6	**96**	No photo	Open pipe under cover	None (covered)	Cleanout	—	—	—	—
CBWest-7	**67**	SC26, CB_52	Two uncapped cleanouts	Surface	Cleanout	G	16	2	13
CBWest-7	**68**	SC26, CB_52	Two uncapped cleanouts	Surface	Cleanout	G	16	2	13
CBWest-7	**66**	SC27, CB_16732	Smoke under rocks near corner of house, under cover	None (covered)	Vent	—	—	—	—
CBWest-F2	**97**	CB5	Broken cleanouts	Surface	Cleanout	G	16	2	13

TABLE 3-4 (continued)

Results of 2018 Smoke Testing – Clallam Bay

Subbasin	Reference No.(1)	Photo| Reference(2)	Description	Potential Source of Inflow	Category	Type	Est. Surface Area (sf)	Est. Peak Inflow (cf/day)	Est. Peak Inflow (gpd)
Light1	**41**	SC8a, SC9a	Open, angled, uncapped cleanout	Surface	Cleanout	G	9	1	7
Light1	**70**	CB16	163 Salt Air St open pipe in bush in front of house, smoke noted behind house	Surface	Cleanout	G	0	0	0
Light2	**42**	SC6a, SC7a	Possible uncapped cleanout, could not locate or access	None	Cleanout	—	—	—	—
Light2	**108**	CB15	Smoking RV dump	Surface	Cleanout	G	16	2	13
Light3	**69**	K20	RV sewer hookup below grade	Surface	Cleanout	G	16	2	13
Total (Clallam Bay)									**3,685**

(1) See Figures 3-3 and 3-4 for specific locations.
(2) See Appendix B for field photographs.

TABLE 3-5

Results of 2018 Smoke Testing – Sekiu

Subbasin	Reference No.[1]	Photo Reference[2]	Description	Potential Source of Inflow	Category	Type	Est. Surface Area (sf)	Est. Peak Inflow (cf/day)	Est. Peak Inflow (gpd)
Air1	**1**	AJ1, AJ2, AJ3, SC7	uncapped pipes above ground	Surface	Cleanout	G	16	2	13
Air1	**2**	SK1, SK1a, SK1b, AJ6, AJ7	Lots 15 and 16, uncapped pipes	Surface	Cleanout	G	16	2	13
Air1	**3**	SK2b, AJ8, AJ9	uncapped pipes above ground	Surface	Cleanout	G	2	0	2
Air1	**4**	SK2b, AJ8, AJ9, AJ12	uncapped pipes above ground	Surface	Cleanout	G	2	0	2
Air1	**5**	AJ13	uncapped pipes, seeping from ground	Surface	Cleanout	G	16	2	13
Air1	**6**	AJ14	uncapped pipes, seeping from ground	Surface	Cleanout	G	16	2	13
Air1	**7**	SK6, AJ15, AJ19	uncapped pipes above ground	Surface	Cleanout	G	16	2	13
Air1	**8**	SK7, AJ16	uncapped pipes above ground, hook up	Surface	Cleanout	G	16	2	13
Air1	**9**	SK4, AJ19	uncapped pipes above ground	Surface	Cleanout	G	16	2	13
Air1	**10**	AJ17, AJ18, SK2b	Uncapped cleanouts in ground	Surface	Cleanout	G	16	2	13
Air1	**12**	SK8, SK8a, SK8b, SK9, SK9a, SC8, SC9	Likely grass covered cleanout (smoke through ground)	Surface	Cleanout	G	16	2	13
Air1	**44**	SC5, AJ4, AJ5	Smoke from ground (covered cleanout? Broken SS?)	Surface or groundwater	Cleanout	G	16	2	13
Air1	**45**	SC6	Open cleanout at ground level	Surface	Cleanout	G	16	2	13
Air1	**87**	K1	loose caps on sewer hookups, #21,23,24,25	None	Cleanout	—	—	—	—
Air1	**88**	No photo	broken pipe	Surface	Cleanout	G	0	0	0
Air1	**90**	K6	broken pipe	Surface	Cleanout	G	0	0	0
Air1	**92**	K2	loose caps on sewer hookups, #21,23,24,25	None	Cleanout	—	—	—	—
Air1	**93**	K2	loose caps on sewer hookups, #21,23,24,25	None	Cleanout	—	—	—	—
Air1	**94**	K2	loose caps on sewer hookups, #21,23,24,25	None	Cleanout	—	—	—	—
Air3	**46**	SC3	Cleanout well capped	None (well capped cleanout above ground)	Cleanout	—	—	—	—
Air3	**43**	SC1	smoke from under eaves (storm?)	None (poor inside ventilation)	Vent	—	—	—	—
Mid1	**60**	SC23	smoke in CO, broken cap	Surface	Cleanout	G	0	0	0
Mid1	**78**	No photo	broken sewer pipe, hookups below grade, spot #33	Surface	Cleanout	I	16	7	54
Mid1	**79**	K13	address 15442, broken caps and pipe	Surface	Cleanout	G	8	1	7
Mid1	**80**	K15	address 15442, broken caps and pipe	Surface	Cleanout	G	0	0	0
Mid1	**81**	K14	address 15442, broken caps and pipe	Surface	Cleanout	G	0	0	0
Mid1	**30**	No photo	smoke visible below roof, couldn't see source	None (likely poor ventilation)	Vent	—	—	—	—
MID-1	**11**	AJ42, AJ43	Possible cleanout marked by metal stake	Surface	Cleanout	I	16	7	54
MID-1	**52**	SC22, SC24	Private manhole where smoke blower placed; Large crack in section wall	Ground	Manhole	G	2	0	2
Sek2	**18**	AJ30	missing caps	Surface	Cleanout	G	2	0	2
Sek2	**19**	AJ31	missing caps	Surface	Cleanout	G	0	0	0
Sek2	**20**	No photo	missing caps/broken pipes	Surface	Cleanout	G	16	2	13
Sek2	**21**	No photo	missing caps/broken pipes	Surface	Cleanout	G	16	2	13
Sek2	**22**	AJ34	Broken cleanout cap	Surface	Cleanout	G	0	0	0
Sek2	**23**	AJ35	Broken cleanout cap	Surface	Cleanout	G	0	0	0
Sek2	**24**	AJ36	Broken cleanout cap	Surface	Cleanout	G	0	0	0
Sek2	**25**	No photo	missing caps/broken pipes	Surface	Cleanout	G	16	2	13
Sek2	**26**	AJ37	Cleanout cap misplaced to the side	Surface	Cleanout	G	2	0	2

TABLE 3-5 (continued)

Results of 2018 Smoke Testing – Sekiu

Subbasin	Reference No.(1)	Photo Reference(2)	Description	Potential Source of Inflow	Category	Type	Est. Surface Area (sf)	Est. Peak Inflow (cf/day)	Est. Peak Inflow (gpd)
Sek3	**27**	AJ38	Broken cleanout cap	None (covered)	Cleanout	—	—	—	—
Sek3	**28**	AJ39, AJ40	Minor manufactured cutout in cleanout cap	Surface	Cleanout	I	0	0	1
Sek3	**29**	AJ41	smoke at foundation corner	None (likely poor ventilation)	Vent	—	—	—	—
Sek5	**16**	AJ26	exposed pipe next to building	Surface	Cleanout	G	25	3	21
Sek5	**82**	SK22, K17	sewer hookup west of Van Riper's in front of dock	None (temporarily uncovered)	Cleanout	—	—	—	—
Sek5	**109**	SK17, SK17a	smoke from county manhole	None	Manhole	—	—	—	—
Sek6	**56**	SC18, SC19, SC20	RV hose, open pipe under woodpile in driveway	Surface	Cleanout	G	2	0	2
Sek6	**110**	No photo	RV with smoke, connection to RV trailer	None (covered)	Cleanout	—	—	—	—
Sek7	**53**	SK18, SC14, SC15, K16	Van Riper's cleanout, broken cap	Surface	Cleanout	I	16	7	54
Sek-F1	**54**	SC21	uncapped RV cleanout	Surface	Cleanout	G	16	2	13
Sek-F1	**55**	SC21	uncapped RV cleanout	Surface	Cleanout	G	16	2	13
Sek-F1	**57**	SC21	uncapped RV cleanout	Surface	Cleanout	G	16	2	13
Sek-F4	**17**	AJ27, SC16	Cleanout with open cap at ground surface	Surface	Cleanout	G	16	2	13
Sek-F4	**50**	No photo	Unknown as observed from afar (no access to site); Presume it is an RV cleanout	Surface	Cleanout	G	16	2	13
Sek-F4	**51**	SC17, AJ28, AJ29	4in PVC out of water meter box	None (covered)	Cleanout	—	—	—	—
Sek-F4	**71**	SC16	Open cleanout at ground level	Surface	Cleanout	G	16	2	13
Sek-F4	**112**	SC16	Open cleanout at ground level	Surface	Cleanout	G	16	2	13
Sek-F4	**113**	SC16	Open cleanout at ground level	Surface	Cleanout	G	16	2	13
Sek-F4	**114**	SC16	Open cleanout at ground level	Surface	Cleanout	G	16	2	13
Sek-F4	**115**	SC16	Open cleanout at ground level	Surface	Cleanout	G	16	2	13
Sek-F4	**116**	SC16	Open cleanout at ground level	Surface	Cleanout	G	16	2	13
SH1	**83**	SK16, K10	cleanout, open pipe east of house	Surface	Cleanout	G	16	2	13
SH1	**84**	K11, K12	faulty sewer connection to travel trailer at south side of house, open cleanout	Surface	Cleanout	I	16	7	54
SH1	**85**	SK13a, K9	Assembly of God Church cleanout, open pipe in blackberry bushes	Surface	Cleanout	G	2	0	2
SH1	**86**	SK10, AJ20, AJ21	open pipe, may be cracked	Surface	Cleanout	G	2	0	2
SH1	**13**	SK11, SK11a, SK11b, AJ22, K8	smoke from side of MH 3.10 at ditch, broken MH or pipe	Full ditch	Manhole	—	—	—	61,023
SH1	**14**	No photo	some smoke at MH	None	Manhole	—	—	—	—
SH1	**15**	SK14, AJ23	broken MH 3.03, smoke from seal of MH, hole hear manhole cover	Full ditch	Manhole	—	—	—	61,023
SH1	**47**	SC10	smoke faintly out of manhole lid	None	Manhole	—	—	—	—
SH1	**48**	SC11	smoke out of north side of manhole (hole in cone of MH 3.01); lid is buried	Full ditch	Manhole	—	—	—	61,023
SH1	**49**	SC12, SC13	smoke out of side of manhole 2.01, 4in diam hole in side of manhole	Full ditch	Manhole	—	—	—	61,023
SH-F1	**89**	K7	open side of cleanout pipe	Surface	Cleanout	G	4	0	3
SH-F1	**91**	K4, K5	open, broken cleanout pipe	Surface	Cleanout	G	0	0	0
Total (Sekiu)									**244,694**

(1) See Figures 3-5 through 3-9 for specific locations.
(2) See Appendix B for field photographs.

CHAPTER 4

MANHOLE INSPECTION

INTRODUCTION

Wastewater collection system manholes represent a relatively easy means of viewing what is occurring in a collection system because manholes:

- Allow for a visual inspection of flow.
- Are potential sources of I/I due to deterioration or due to the method they were constructed.
- Are insertion points for flow meters to measure flows within a collection system.

Manhole inspections were part of the 1990 I/I study and were a component of this current analysis as well. Manholes were inspected primarily to determine the condition of the manholes and their potential to contribute I/I to the collection system.

RECENT INSPECTION RESULTS

In collaboration with County staff, 33 manholes were inspected on May 10 and 11, 2018. Weather during the inspections was mostly overcast with short periods of mild showers. Manholes were selected based on the past I/I study, flow metering results, and County staff knowledge.

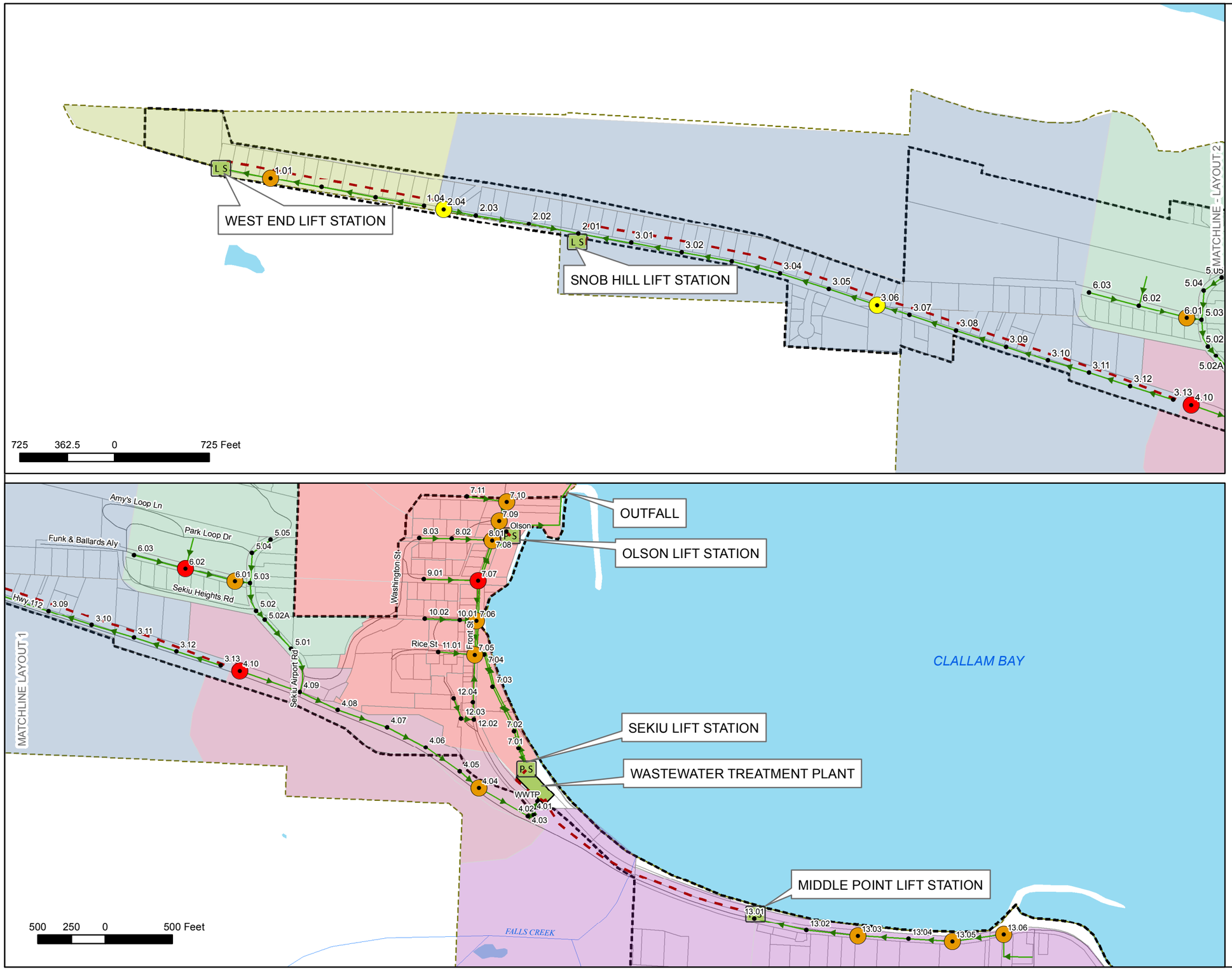
Figures 4-1 and 4-2 show the manholes that were inspected. Manhole inspection forms and photographs are found in Appendix D.

Manholes with apparent I/I issues noted during the inspection are listed in Table 4-1. Of the 33 manholes inspected, 30 were determined to have a reportable issue, four of which were considered severe issues. Issues were rated from 1 to 3 with 3 being the most severe. Due to low precipitation and groundwater levels at the time of inspection, many of the issues reported were signs of potential I/I but no I/I flow was witnessed.

TABLE 4-1

Manhole Inspection Results for Problem Manholes

Manhole Number	Rating	Observation	Recommendation
1.01	2	Sign of mild infiltration on walls	Seal manhole walls
2.04	1	Sign of mild infiltration on walls	Clean manhole, seal walls
3.06	1	Pile of organics at downstream end causing flow to backup	Clean manhole
4.04	2	Sign of mild infiltration on walls	Seal manhole walls
4.10	3	Hole in channel wall with visible infiltration	Seal channel hole
5.02	2	Slight seepage from cone sections	Seal manhole walls
6.01	2	Slight seepage from risers	Seal manhole walls
6.02	3	~30 gpm of clear flow coming from the north	Investigate for leaks to the north
7.10	2	Brick riser is missing grouting	Clean manhole, regrout brick riser
7.05	2	Gap in cone section with sign of seepage	Seal manhole walls
7.06	2	Sign of inflow from around lid	Seal manhole walls
7.07	3	Grouting falling apart with sign of inflow	Regrout
7.08	2	Brick grouting falling apart	Regrout
7.09	2	Brick grouting falling apart	Regrout
13.03	2	Lots of mud on walls and side of channel, lid does not fit properly	Clean manhole, seal walls, replace lid
13.05	2	Mud on walls, rock and sludge sediment on bottom	Clean manhole, seal walls
13.06	2	Sign of mild I/I, pipes and channel partially full with rocks	Clean manhole, seal walls
14.01	2	Minor sediment in channel, sign of seepage from cone sections	Clean manhole, seal walls
16.01	1	Sediment on sides of channel	Clean manhole
18.02	3	Giant orange blob of mud/iron/bacteria w/infiltration below 4″ pipe from north (above 8″ pipe)	Clean manhole, seal walls
18.05	1	Sign of mild I/I, sediment in channel	Clean manhole, seal walls
18.08	2	Sign of I/I at manhole joints	Seal manhole walls
19.05	2	Sign of I/I at manhole joints and lid	Seal manhole walls
19.06	2	Sign of I/I at manhole joints	Seal manhole walls
19.07	2	Sign of I/I at manhole joints, sediment in channel	Clean manhole, seal walls
25.03	3	Pinhole spouts water into manhole during winter	Repair/seal manhole
26.01	1	Sign of seepage at joints, lid buried in asphalt	Raise lid, seal manhole walls
26.02	2	Seepage at joints, organics in channel	Clean manhole, seal walls
31.02	2	Sign of seepage at joints	Seal manhole walls
32.01	2	Sign of seepage at joints	Raise lid, seal manhole walls
18.06A	2	Sign of seepage at joints	Seal manhole walls



N

LEGEND

Manhole Inspection Rating

- 1: Less Severe
- 2: Somewhat Severe
- 3: Most Severe
- Sewer Manhole
- Force Main
- Sanitary Sewer Pipe
- Lift Station
- Wastewater Treatment Plant

Sewer Basin

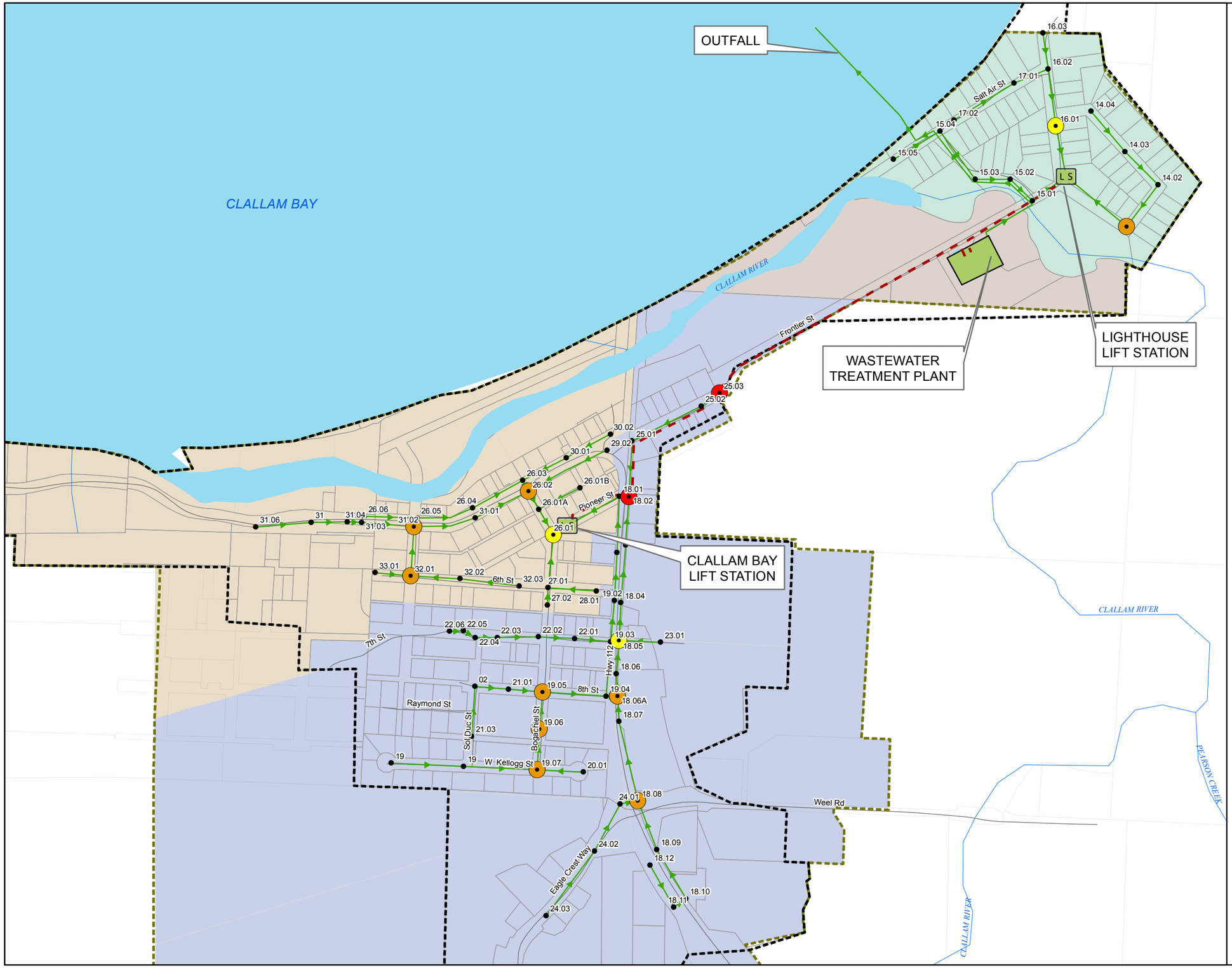
- Highway 112
- Middle Point LS
- Sekiu Airport Rd
- Sekiu LS
- Snob Hill LS
- West End LS
- Sewer Service Area
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 4-1
MANHOLES INSPECTED (SEKIU)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Manhole Inspection Figure.mxd



N

0 250 500 1,000 Feet

LEGEND

Rating

- 1: Less Severe
- 2: Somewhat Severe
- 3: Most Severe

Sewer Basin

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Lighthouse LS

- Sewer Manhole
- Sanitary Sewer Pipe
- Force Main
- Lift Station
- Wastewater Treatment Plant
- Current Sewer Service Area
- UGA Boundary
- Parcel
- Waterbody

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 4-2
MANHOLES INSPECTED (CLALLAM BAY)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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CHAPTER 5

CLOSED CIRCUIT TELEVISION (CCTV)

INTRODUCTION

Closed circuit television (CCTV) was used to investigate I/I sources. A CCTV camera is sent through sewer pipes which allow observation of potential leaks, pipe/joint deterioration, separated joints, and root intrusions. Pipes within the Sekiu and Clallam Bay sewer systems were videoed on August 28 – September 6, 2018 in the locations shown in Figures 5-1 through 5-4. In general, the gravity system had not been cleaned since it was installed in the 1970s; and therefore, a rigorous cleaning had to take place prior to the pipes being videoed. Staff noted that in general, very large amounts of "black rock" existed along the Snob Hill trunk line and was largely blocking the piping system. Likewise, Middle Point also had a lot of debris within it, possibly from construction. They also noted that generally, the risers within the manhole had separation and were likely a source of I/I.

CCTV RESULTS

Potential conveyance system repairs or replacements were identified based on the CCTV inspection. The following assumptions were used when determining recommended conveyance system solutions identified in the CCTV inspection.

- Side sewer replacement includes only repairing 5 LF of pipe right at the connection to the main sewer line.
- Manholes that have I/I potential due to evidence of leaks or visual separation in the grade rings would be replaced, rather than repaired, due to the age of the system.
- Pipe repairs/replacements range from fixing the joints between two pipes to replacing the full stretch of sewer main from the upstream manhole to the downstream manhole.

Specific areas of pipe repair/replacement include the following.

- **Middle Point LS Basin:**
    - Install 120 feet of new pipe to remove the "S" bend located between MH 13.06 and 13.05 – a source of blockage evident in the CCTV inspection.

- **Sekiu LS Basin:**
    - Joints appeared barely separated between MH 7.07 and 7.06. Assumed to be a potential project for the near future.
- **Snob Hill Basin:**
    - Replace four manholes that have holes in the cones (first priority). Full pipe replacement of aged, corroding pipe for all concrete pipes within the Snob Hill LS Basin, total 5,845 LF (second priority).
- **Sekiu Airport Road Basin:**
    - Install a flexible coupling between two PVC pipes located approximately 276 feet downstream of MH 6.02. Joint is separated allowing either sewage to flow out or infiltration of groundwater to enter into the pipe.
    - Repair the pulled joint at the side sewer connection upstream of MH 6.02.

Figure E contains photographic results from the inspection whereas a summary of the recommendations resulting from the CCTV inspection is shown in Table 5-1.

TABLE 5-1

Recommended Conveyance Solutions Resulting from CCTV Inspection

Basin	Replace Side Sewer	Repair/Replace MH	Replace Pipe Segment (LF)
Sekiu			
Middle Point Lift Station	2	2	120
Sekiu Lift Station	--	2	275
Snob Hill Lift Station	21	14	5,845
Sekiu Airport Road	1	--	5
Total	**24**	**18**	**6,245**

N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

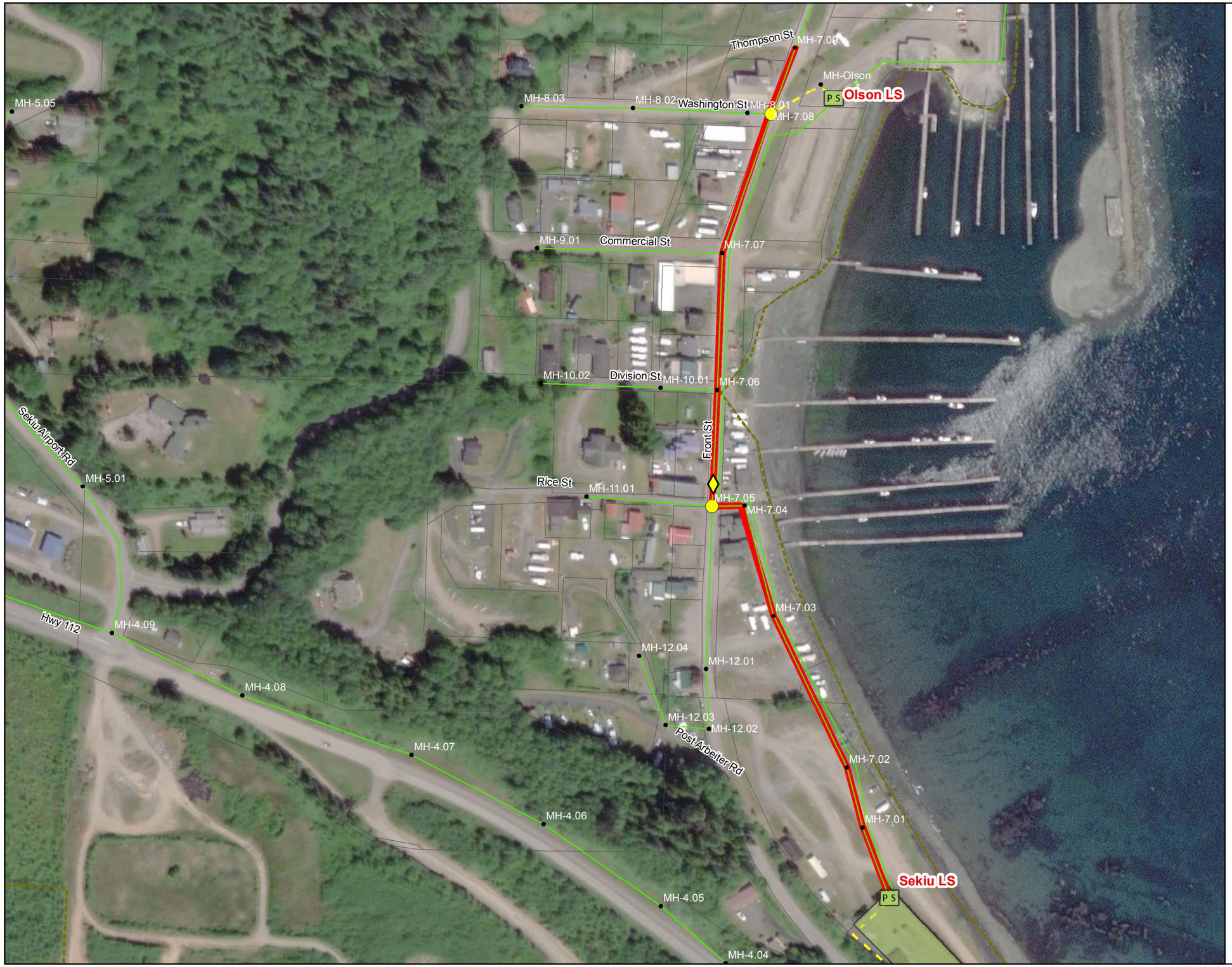
- Recommended MH Repair
- Recommended Pipe Repair
- Recommended Side Sewer Repair
- CCTV Pipe Results
- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 5-1
SEWER CCTV INSPECTION RESULTS
(MIDDLE POINT)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\I and I Study Fig 5-1 TV map.mxd



N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

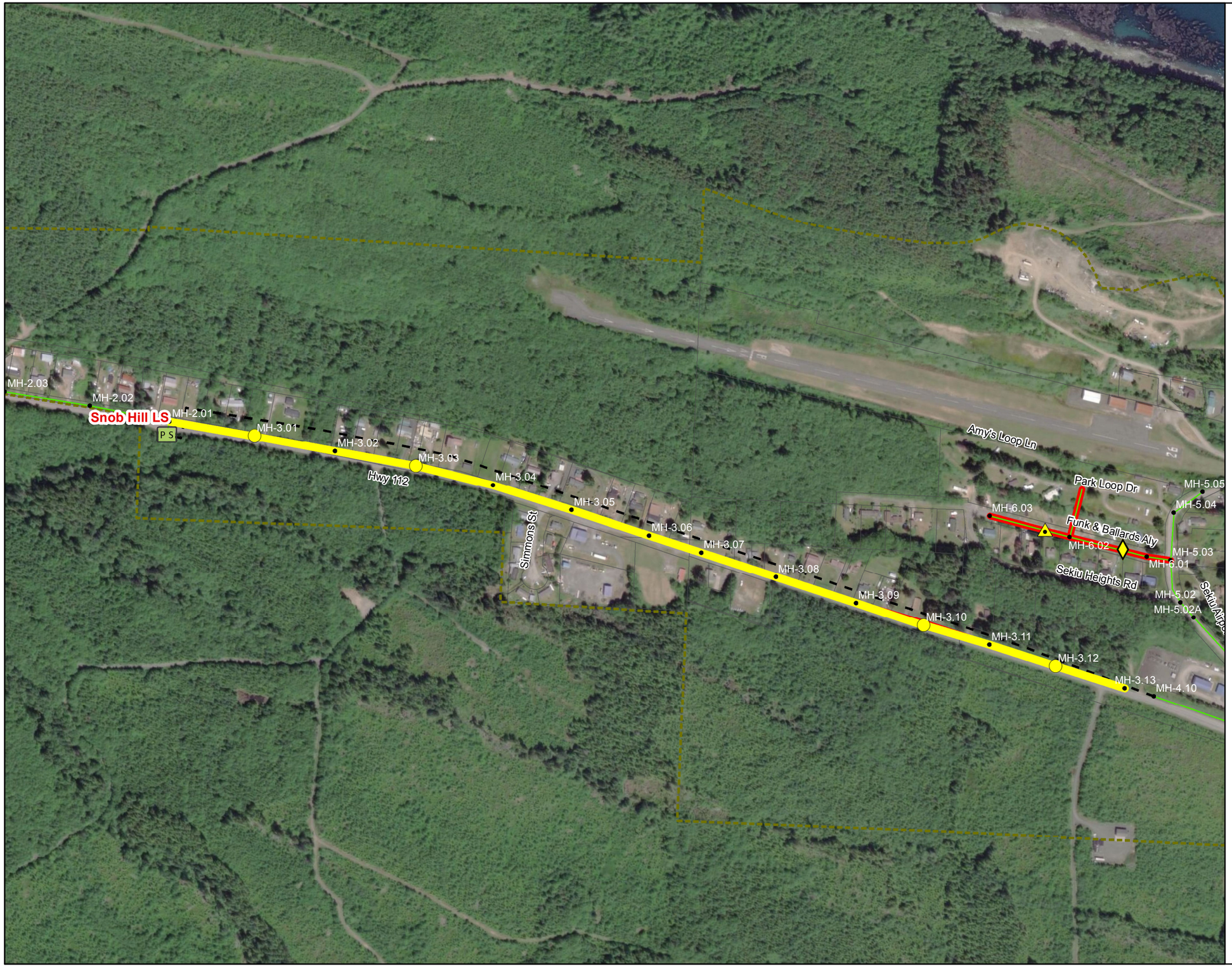
- Recommended MH Repair
- Recommended Pipe Repair
- Recommended Side Sewer Repair
- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 5-2
SEWER CCTV INSPECTION RESULTS
(FRONT ST.)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\I and I Study Fig 5-2 TV map.mxd



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- Recommended MH Repair
- Recommended Pipe Repair
- Recommended Side Sewer Repair
- Pipe Repair
- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 5-3
SEWER CCTV INSPECTION RESULTS
(SNOB HILL)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\I and I Study Fig 5-3 TV map.mxd

N

0 75 150 300 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- MH Repair
- Spot Pipe Repair
- Side Sewer Repair
- Pipe Repair

Videoed Sewer Pipe

- Videoed Sewer Pipe
- Manhole
- PIPES
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- UGA BOUNDARY

CLALLAM BAY/SEKIU INFLOW/INFILTRATION STUDY

FIGURE 5-4
SEWER CCTV INSPECTION RESULTS
(BOGACHIEL ST.)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\I and I Study Fig 5-4 TV map.mxd

APPENDIX A

FLOW METER DATA

Site 10 – MH 7.03 Flow Meter Data

Inst Time	Flow (gpm)
4/6/2018 10:00	11.9791
4/6/2018 10:15	18.19859
4/6/2018 10:30	24.08767
4/6/2018 10:45	24.73574
4/6/2018 11:00	24.28241
4/6/2018 11:15	26.20103
4/6/2018 11:30	26.20103
4/6/2018 11:45	26.81993
4/6/2018 12:00	26.81993
4/6/2018 12:15	27.0042
4/6/2018 12:30	26.99787
4/6/2018 12:45	26.51608
4/6/2018 13:00	25.75168
4/6/2018 13:15	25.47114
4/6/2018 13:30	25.47114
4/6/2018 13:45	25.27566
4/6/2018 14:00	27.59553
4/6/2018 14:15	27.59553
4/6/2018 14:30	24.53458
4/6/2018 14:45	24.57054
4/6/2018 15:00	24.57054
4/6/2018 15:15	24.57054
4/6/2018 15:30	24.87493
4/6/2018 15:45	24.87493
4/6/2018 16:00	26.94784
4/6/2018 16:15	27.72518
4/6/2018 16:30	27.72518
4/6/2018 16:45	25.91139
4/6/2018 17:00	25.91139
4/6/2018 17:15	25.91139
4/6/2018 17:30	25.91139
4/6/2018 17:45	25.13405
4/6/2018 18:00	24.87734
4/6/2018 18:15	24.37139
4/6/2018 18:30	24.40732
4/6/2018 18:45	23.87593
4/6/2018 19:00	24.5965
4/6/2018 19:15	24.5965
4/6/2018 19:30	25.86447
4/6/2018 19:45	26.43892
4/6/2018 20:00	26.85383
4/6/2018 20:15	26.85383
4/6/2018 20:30	26.85383
4/6/2018 20:45	27.72816
4/6/2018 21:00	23.96988
4/6/2018 21:15	21.58837
4/6/2018 21:30	21.45447
4/6/2018 21:45	25.3815
4/6/2018 22:00	24.85817
4/6/2018 22:15	24.85817
4/6/2018 22:30	24.66698
4/6/2018 22:45	24.47617
4/6/2018 23:00	22.34132
4/6/2018 23:15	22.34132
4/6/2018 23:30	25.46775
4/6/2018 23:45	25.50547
4/7/2018 0:00	25.50547
4/7/2018 0:15	25.26958
4/7/2018 0:30	25.10946
4/7/2018 0:45	25.84347
4/7/2018 1:00	27.12714
4/7/2018 1:15	27.12714
4/7/2018 1:30	27.34085
4/7/2018 1:45	26.8298
4/7/2018 2:00	27.03993
4/7/2018 2:15	27.03993
4/7/2018 2:30	27.29247
4/7/2018 2:45	56.66114
4/7/2018 3:00	68.76619
4/7/2018 3:15	76.30663
4/7/2018 3:30	76.57928
4/7/2018 3:45	76.57928
4/7/2018 4:00	78.69666
4/7/2018 4:15	77.45509
4/7/2018 4:30	77.09243
4/7/2018 4:45	73.97051
4/7/2018 5:00	66.87305
4/7/2018 5:15	57.38277
4/7/2018 5:30	52.36926
4/7/2018 5:45	29.89709
4/7/2018 6:00	29.28256
4/7/2018 6:15	29.21418
4/7/2018 6:30	28.41475
4/7/2018 6:45	28.45584
4/7/2018 7:00	28.1501
4/7/2018 7:15	28.36455
4/7/2018 7:30	33.95677
4/7/2018 7:45	33.95677
4/7/2018 8:00	27.11516
4/7/2018 8:15	28.68951
4/7/2018 8:30	28.47261
4/7/2018 8:45	28.47261
4/7/2018 9:00	30.01529
4/7/2018 9:15	30.01529
4/7/2018 9:30	29.78836

Site 10 – MH 7.03 Flow Meter Data

4/7/2018 9:45	29.62461
4/7/2018 10:00	30.21048
4/7/2018 10:15	29.72095
4/7/2018 10:30	47.46457
4/7/2018 10:45	47.46457
4/7/2018 11:00	45.90482
4/7/2018 11:15	45.92263
4/7/2018 11:30	46.41088
4/7/2018 11:45	47.58401
4/7/2018 12:00	48.17273
4/7/2018 12:15	51.81665
4/7/2018 12:30	52.11119
4/7/2018 12:45	64.38521
4/7/2018 13:00	64.38521
4/7/2018 13:15	64.38521
4/7/2018 13:30	63.22437
4/7/2018 13:45	60.67282
4/7/2018 14:00	60.67282
4/7/2018 14:15	60.67282
4/7/2018 14:30	60.84472
4/7/2018 14:45	61.63261
4/7/2018 15:00	66.6048
4/7/2018 15:15	66.6048
4/7/2018 15:30	69.1238
4/7/2018 15:45	69.35385
4/7/2018 16:00	68.49936
4/7/2018 16:15	70.76087
4/7/2018 16:30	72.65858
4/7/2018 16:45	74.97331
4/7/2018 17:00	77.58248
4/7/2018 17:15	80.25147
4/7/2018 17:30	83.66515
4/7/2018 17:45	91.64922
4/7/2018 18:00	93.24147
4/7/2018 18:15	96.77553
4/7/2018 18:30	97.57357
4/7/2018 18:45	106.7216
4/7/2018 19:00	105.6725
4/7/2018 19:15	105.6725
4/7/2018 19:30	104.4764
4/7/2018 19:45	105.8863
4/7/2018 20:00	104.2762
4/7/2018 20:15	106.0703
4/7/2018 20:30	106.0703
4/7/2018 20:45	106.0703
4/7/2018 21:00	103.4202
4/7/2018 21:15	104.5854
4/7/2018 21:30	89.62876
4/7/2018 21:45	79.0433
4/7/2018 22:00	79.0433
4/7/2018 22:15	75.56647
4/7/2018 22:30	60.08287
4/7/2018 22:45	47.57093
4/7/2018 23:00	45.28391
4/7/2018 23:15	45.02692
4/7/2018 23:30	44.86255
4/7/2018 23:45	38.11008
4/8/2018 0:00	38.61004
4/8/2018 0:15	38.86058
4/8/2018 0:30	80.42671
4/8/2018 0:45	84.08442
4/8/2018 1:00	98.42287
4/8/2018 1:15	103.5725
4/8/2018 1:30	105.4272
4/8/2018 1:45	105.8923
4/8/2018 2:00	105.4272
4/8/2018 2:15	99.34538
4/8/2018 2:30	97.16362
4/8/2018 2:45	38.11545
4/8/2018 3:00	36.13488
4/8/2018 3:15	35.91623
4/8/2018 3:30	35.91623
4/8/2018 3:45	36.13488
4/8/2018 4:00	44.95367
4/8/2018 4:15	46.21046
4/8/2018 4:30	46.96787
4/8/2018 4:45	46.96787
4/8/2018 5:00	105.5822
4/8/2018 5:15	105.5822
4/8/2018 5:30	104.7233
4/8/2018 5:45	97.2731
4/8/2018 6:00	97.25258
4/8/2018 6:15	97.25258
4/8/2018 6:30	104.163
4/8/2018 6:45	104.6909
4/8/2018 7:00	104.6909
4/8/2018 7:15	53.97398
4/8/2018 7:30	51.8273
4/8/2018 7:45	55.6123
4/8/2018 8:00	93.69454
4/8/2018 8:15	45.7277
4/8/2018 8:30	43.50883
4/8/2018 8:45	54.40035
4/8/2018 9:00	53.77225
4/8/2018 9:15	53.77225
4/8/2018 9:30	57.38707

Site 10 – MH 7.03 Flow Meter Data

4/8/2018 9:45	59.17484
4/8/2018 10:00	59.38445
4/8/2018 10:15	59.72706
4/8/2018 10:30	59.23421
4/8/2018 10:45	59.23421
4/8/2018 11:00	57.21845
4/8/2018 11:15	56.96301
4/8/2018 11:30	55.90519
4/8/2018 11:45	55.57785
4/8/2018 12:00	54.21885
4/8/2018 12:15	54.21885
4/8/2018 12:30	48.93081
4/8/2018 12:45	52.63768
4/8/2018 13:00	51.38011
4/8/2018 13:15	51.57009
4/8/2018 13:30	49.92535
4/8/2018 13:45	49.92535
4/8/2018 14:00	47.4027
4/8/2018 14:15	45.38145
4/8/2018 14:30	45.38145
4/8/2018 14:45	40.38333
4/8/2018 15:00	40.38333
4/8/2018 15:15	44.11164
4/8/2018 15:30	44.11164
4/8/2018 15:45	43.71099
4/8/2018 16:00	43.71099
4/8/2018 16:15	43.71099
4/8/2018 16:30	43.71099
4/8/2018 16:45	45.3848
4/8/2018 17:00	45.47012
4/8/2018 17:15	46.57285
4/8/2018 17:30	46.6599
4/8/2018 17:45	46.6599
4/8/2018 18:00	46.98007
4/8/2018 18:15	46.6599
4/8/2018 18:30	46.6599
4/8/2018 18:45	44.71766
4/8/2018 19:00	44.59063
4/8/2018 19:15	43.69955
4/8/2018 19:30	44.88258
4/8/2018 19:45	44.88258
4/8/2018 20:00	44.88258
4/8/2018 20:15	44.91973
4/8/2018 20:30	44.02081
4/8/2018 20:45	43.69949
4/8/2018 21:00	43.10791
4/8/2018 21:15	43.05076
4/8/2018 21:30	42.76675
4/8/2018 21:45	41.93355
4/8/2018 22:00	42.16027
4/8/2018 22:15	40.13228
4/8/2018 22:30	40.13228
4/8/2018 22:45	40.40422
4/8/2018 23:00	40.88343
4/8/2018 23:15	43.77568
4/8/2018 23:30	43.77568
4/8/2018 23:45	43.64119
4/9/2018 0:00	42.44577
4/9/2018 0:15	41.50476
4/9/2018 0:30	40.57333
4/9/2018 0:45	39.68414
4/9/2018 1:00	39.41665
4/9/2018 1:15	38.51193
4/9/2018 1:30	38.83352
4/9/2018 1:45	38.83352
4/9/2018 2:00	39.46679
4/9/2018 2:15	38.50792
4/9/2018 2:30	37.49471
4/9/2018 2:45	37.78995
4/9/2018 3:00	37.49471
4/9/2018 3:15	36.28446
4/9/2018 3:30	35.76988
4/9/2018 3:45	35.76988
4/9/2018 4:00	34.90793
4/9/2018 4:15	34.90793
4/9/2018 4:30	34.40474
4/9/2018 4:45	34.15453
4/9/2018 5:00	34.15453
4/9/2018 5:15	34.40474
4/9/2018 5:30	37.23003
4/9/2018 5:45	37.23003
4/9/2018 6:00	37.23003
4/9/2018 6:15	36.07495
4/9/2018 6:30	34.9357
4/9/2018 6:45	34.32486
4/9/2018 7:00	33.87133
4/9/2018 7:15	33.26793
4/9/2018 7:30	30.84378
4/9/2018 7:45	31.07165
4/9/2018 8:00	32.77771
4/9/2018 8:15	30.04623
4/9/2018 8:30	30.04596
4/9/2018 8:45	32.79363
4/9/2018 9:00	32.79363
4/9/2018 9:15	36.5573
4/9/2018 9:30	36.5573

Site 10 – MH 7.03 Flow Meter Data

4/9/2018 9:45	36.5573
4/9/2018 10:00	36.47251
4/9/2018 10:15	33.55973
4/9/2018 10:30	25.9452
4/9/2018 10:45	28.66931
4/9/2018 11:00	31.43243
4/9/2018 11:15	34.30246
4/9/2018 11:30	31.43243
4/9/2018 11:45	32.34619
4/9/2018 12:00	31.85721
4/9/2018 12:15	31.37992
4/9/2018 12:30	30.40122
4/9/2018 12:45	30.20887
4/9/2018 13:00	29.93672
4/9/2018 13:15	40.41244
4/9/2018 13:30	40.41244
4/9/2018 13:45	28.25322
4/9/2018 14:00	28.03339
4/9/2018 14:15	27.59504
4/9/2018 14:30	27.59504
4/9/2018 14:45	28.33256
4/9/2018 15:00	28.33256
4/9/2018 15:15	28.84306
4/9/2018 15:30	35.64663
4/9/2018 15:45	28.84306
4/9/2018 16:00	25.83899
4/9/2018 16:15	26.31539
4/9/2018 16:30	26.14672
4/9/2018 16:45	26.107
4/9/2018 17:00	27.10155
4/9/2018 17:15	27.14278
4/9/2018 17:30	28.73521
4/9/2018 17:45	28.1875
4/9/2018 18:00	25.66628
4/9/2018 18:15	25.26958
4/9/2018 18:30	25.73975
4/9/2018 18:45	25.07183
4/9/2018 19:00	25.07183
4/9/2018 19:15	24.80573
4/9/2018 19:30	24.80573
4/9/2018 19:45	24.80573
4/9/2018 20:00	25.31197
4/9/2018 20:15	25.51161
4/9/2018 20:30	25.91211
4/9/2018 20:45	27.31737
4/9/2018 21:00	25.42106
4/9/2018 21:15	25.37976
4/9/2018 21:30	23.58655
4/9/2018 21:45	25.68313
4/9/2018 22:00	27.77971
4/9/2018 22:15	26.96229
4/9/2018 22:30	26.48262
4/9/2018 22:45	26.68642
4/9/2018 23:00	26.68642
4/9/2018 23:15	25.36531
4/9/2018 23:30	25.36531
4/9/2018 23:45	25.39047
4/10/2018 0:00	25.39047
4/10/2018 0:15	25.39047
4/10/2018 0:30	26.82226
4/10/2018 0:45	26.61855
4/10/2018 1:00	26.67304
4/10/2018 1:15	26.67304
4/10/2018 1:30	26.4222
4/10/2018 1:45	26.20728
4/10/2018 2:00	26.22042
4/10/2018 2:15	26.00597
4/10/2018 2:30	26.00597
4/10/2018 2:45	26.00597
4/10/2018 3:00	25.48585
4/10/2018 3:15	25.48585
4/10/2018 3:30	25.48585
4/10/2018 3:45	25.48585
4/10/2018 4:00	25.21304
4/10/2018 4:15	24.47735
4/10/2018 4:30	23.97434
4/10/2018 4:45	24.47735
4/10/2018 5:00	24.47735
4/10/2018 5:15	24.72222
4/10/2018 5:30	24.7477
4/10/2018 5:45	24.77283
4/10/2018 6:00	26.67681
4/10/2018 6:15	26.75814
4/10/2018 6:30	27.21395
4/10/2018 6:45	27.21395
4/10/2018 7:00	26.5526
4/10/2018 7:15	26.5526
4/10/2018 7:30	27.00491
4/10/2018 7:45	51.73248
4/10/2018 8:00	54.30943
4/10/2018 8:15	55.1428
4/10/2018 8:30	53.52999
4/10/2018 8:45	43.51226
4/10/2018 9:00	38.34885
4/10/2018 9:15	36.9626
4/10/2018 9:30	29.05309

Site 10 – MH 7.03 Flow Meter Data

4/10/2018 9:45	28.01035
4/10/2018 10:00	26.17076
4/10/2018 10:15	25.9532
4/10/2018 10:30	25.96688
4/10/2018 10:45	25.96688
4/10/2018 11:00	27.2254
4/10/2018 11:15	27.06577
4/10/2018 11:30	28.24034
4/10/2018 11:45	27.97696
4/10/2018 12:00	27.97696
4/10/2018 12:15	27.03527
4/10/2018 12:30	26.57619
4/10/2018 12:45	26.61619
4/10/2018 13:00	27.03701
4/10/2018 13:15	26.61619
4/10/2018 13:30	27.03701
4/10/2018 13:45	27.00992
4/10/2018 14:00	27.00992
4/10/2018 14:15	25.07012
4/10/2018 14:30	26.79951
4/10/2018 14:45	25.26811
4/10/2018 15:00	25.05742
4/10/2018 15:15	24.66278
4/10/2018 15:30	25.29256
4/10/2018 15:45	24.26978
4/10/2018 16:00	23.98663
4/10/2018 16:15	23.98663
4/10/2018 16:30	23.79208
4/10/2018 16:45	23.79208
4/10/2018 17:00	22.08422
4/10/2018 17:15	25.93911
4/10/2018 17:30	26.14993
4/10/2018 17:45	22.80434
4/10/2018 18:00	22.58963
4/10/2018 18:15	22.38479
4/10/2018 18:30	22.03061
4/10/2018 18:45	22.23221
4/10/2018 19:00	19.54577
4/10/2018 19:15	22.26233
4/10/2018 19:30	22.07956
4/10/2018 19:45	21.40085
4/10/2018 20:00	18.48205
4/10/2018 20:15	18.32234
4/10/2018 20:30	18.32234
4/10/2018 20:45	16.59023
4/10/2018 21:00	18.76221
4/10/2018 21:15	18.37559
4/10/2018 21:30	18.73608
4/10/2018 21:45	18.23427
4/10/2018 22:00	16.31542
4/10/2018 22:15	14.23799
4/10/2018 22:30	14.23799
4/10/2018 22:45	14.23799
4/10/2018 23:00	37.41014
4/10/2018 23:15	38.61492
4/10/2018 23:30	40.04564
4/10/2018 23:45	39.16571
4/11/2018 0:00	32.94995
4/11/2018 0:15	18.25725
4/11/2018 0:30	18.25725
4/11/2018 0:45	17.26628
4/11/2018 1:00	17.14275
4/11/2018 1:15	17.11317
4/11/2018 1:30	19.86206
4/11/2018 1:45	16.53036
4/11/2018 2:00	16.55892
4/11/2018 2:15	17.00375
4/11/2018 2:30	19.54281
4/11/2018 2:45	17.52381
4/11/2018 3:00	17.67537
4/11/2018 3:15	17.67537
4/11/2018 3:30	17.52381
4/11/2018 3:45	17.31205
4/11/2018 4:00	16.19289
4/11/2018 4:15	16.18341
4/11/2018 4:30	16.19289
4/11/2018 4:45	16.19289
4/11/2018 5:00	17.29186
4/11/2018 5:15	19.16309
4/11/2018 5:30	19.96384
4/11/2018 5:45	20.21953
4/11/2018 6:00	21.36819
4/11/2018 6:15	20.86655
4/11/2018 6:30	20.6832
4/11/2018 6:45	20.68537
4/11/2018 7:00	21.72967
4/11/2018 7:15	20.86655
4/11/2018 7:30	20.6832
4/11/2018 7:45	20.46317
4/11/2018 8:00	19.99976
4/11/2018 8:15	20.17384
4/11/2018 8:30	20.17384
4/11/2018 8:45	35.97835
4/11/2018 9:00	38.46675
4/11/2018 9:15	40.17876
4/11/2018 9:30	40.33025

Site 10 – MH 7.03 Flow Meter Data

4/11/2018 9:45	40.6819
4/11/2018 10:00	40.41034
4/11/2018 10:15	39.77096
4/11/2018 10:30	37.47113
4/11/2018 10:45	36.25943
4/11/2018 11:00	24.35624
4/11/2018 11:15	22.32128
4/11/2018 11:30	21.75329
4/11/2018 11:45	21.75329
4/11/2018 12:00	21.35751
4/11/2018 12:15	21.35751
4/11/2018 12:30	21.35751
4/11/2018 12:45	20.89821
4/11/2018 13:00	22.07585
4/11/2018 13:15	20.72211
4/11/2018 13:30	20.72211
4/11/2018 13:45	21.1655
4/11/2018 14:00	20.98607
4/11/2018 14:15	21.1655
4/11/2018 14:30	21.1655
4/11/2018 14:45	21.104
4/11/2018 15:00	20.52887
4/11/2018 15:15	20.58797
4/11/2018 15:30	20.24356
4/11/2018 15:45	20.24356
4/11/2018 16:00	20.65755
4/11/2018 16:15	21.35387
4/11/2018 16:30	21.35387
4/11/2018 16:45	20.83089
4/11/2018 17:00	20.83089
4/11/2018 17:15	21.76711
4/11/2018 17:30	20.34024
4/11/2018 17:45	21.25152
4/11/2018 18:00	21.40523
4/11/2018 18:15	21.40523
4/11/2018 18:30	20.89821
4/11/2018 18:45	21.55008
4/11/2018 19:00	22.27148
4/11/2018 19:15	21.00657
4/11/2018 19:30	19.49043
4/11/2018 19:45	19.27592
4/11/2018 20:00	19.27592
4/11/2018 20:15	19.27592
4/11/2018 20:30	19.44724
4/11/2018 20:45	18.51732
4/11/2018 21:00	18.51732
4/11/2018 21:15	17.86714
4/11/2018 21:30	17.25186
4/11/2018 21:45	16.73988
4/11/2018 22:00	16.73988
4/11/2018 22:15	17.68979
4/11/2018 22:30	16.42924
4/11/2018 22:45	16.42924
4/11/2018 23:00	17.68979
4/11/2018 23:15	17.61606
4/11/2018 23:30	17.61467
4/11/2018 23:45	17.78074
4/12/2018 0:00	17.81476
4/12/2018 0:15	17.78074
4/12/2018 0:30	16.82505
4/12/2018 0:45	16.82505
4/12/2018 1:00	18.3154
4/12/2018 1:15	21.07751
4/12/2018 1:30	21.07751
4/12/2018 1:45	21.07751
4/12/2018 2:00	21.31171
4/12/2018 2:15	20.14074
4/12/2018 2:30	20.14074
4/12/2018 2:45	20.15993
4/12/2018 3:00	19.82314
4/12/2018 3:15	19.1834
4/12/2018 3:30	18.88824
4/12/2018 3:45	17.76677
4/12/2018 4:00	16.30218
4/12/2018 4:15	16.07248
4/12/2018 4:30	15.33284
4/12/2018 4:45	15.33284
4/12/2018 5:00	15.33284
4/12/2018 5:15	15.62742
4/12/2018 5:30	17.62642
4/12/2018 5:45	19.98754
4/12/2018 6:00	20.25741
4/12/2018 6:15	19.81553
4/12/2018 6:30	19.5625
4/12/2018 6:45	18.77755
4/12/2018 7:00	18.8531
4/12/2018 7:15	18.8531
4/12/2018 7:30	18.8531
4/12/2018 7:45	19.2131
4/12/2018 8:00	16.56718
4/12/2018 8:15	16.87314
4/12/2018 8:30	16.87314
4/12/2018 8:45	16.87314
4/12/2018 9:00	16.55672
4/12/2018 9:15	16.48215
4/12/2018 9:30	16.18328

Site 10 – MH 7.03 Flow Meter Data

4/12/2018 9:45	16.40439
4/12/2018 10:00	18.18349
4/12/2018 10:15	19.49004
4/12/2018 10:30	19.49004
4/12/2018 10:45	19.49004
4/12/2018 11:00	19.53576
4/12/2018 11:15	19.38902
4/12/2018 11:30	19.03696
4/12/2018 11:45	18.26745
4/12/2018 12:00	19.04273
4/12/2018 12:15	19.04273
4/12/2018 12:30	19.04273
4/12/2018 12:45	18.60126
4/12/2018 13:00	19.04273
4/12/2018 13:15	18.53397
4/12/2018 13:30	18.08341
4/12/2018 13:45	18.40521
4/12/2018 14:00	17.98952
4/12/2018 14:15	17.98952
4/12/2018 14:30	17.04984
4/12/2018 14:45	17.04984
4/12/2018 15:00	17.04984
4/12/2018 15:15	18.72146
4/12/2018 15:30	18.22142
4/12/2018 15:45	18.88321
4/12/2018 16:00	18.88321
4/12/2018 16:15	18.22142
4/12/2018 16:30	17.54983
4/12/2018 16:45	16.55134
4/12/2018 17:00	15.9009
4/12/2018 17:15	15.9009
4/12/2018 17:30	15.5044
4/12/2018 17:45	15.5044
4/12/2018 18:00	15.45129
4/12/2018 18:15	17.05532
4/12/2018 18:30	17.05532
4/12/2018 18:45	17.39169
4/12/2018 19:00	17.77356
4/12/2018 19:15	17.35549
4/12/2018 19:30	17.35549
4/12/2018 19:45	17.39169
4/12/2018 20:00	17.40355
4/12/2018 20:15	17.35882
4/12/2018 20:30	17.40355
4/12/2018 20:45	17.40355
4/12/2018 21:00	17.13173
4/12/2018 21:15	15.72784
4/12/2018 21:30	15.97805
4/12/2018 21:45	15.59954
4/12/2018 22:00	15.94607
4/12/2018 22:15	15.59954
4/12/2018 22:30	16.81283
4/12/2018 22:45	16.6413
4/12/2018 23:00	16.6413
4/12/2018 23:15	14.91493
4/12/2018 23:30	15.29264
4/12/2018 23:45	15.29264
4/13/2018 0:00	15.16536
4/13/2018 0:15	15.16536
4/13/2018 0:30	15.99867
4/13/2018 0:45	15.99867
4/13/2018 1:00	15.50453
4/13/2018 1:15	15.65528
4/13/2018 1:30	15.65528
4/13/2018 1:45	15.98581
4/13/2018 2:00	16.13676
4/13/2018 2:15	15.38995
4/13/2018 2:30	14.97599
4/13/2018 2:45	13.73301
4/13/2018 3:00	12.35563
4/13/2018 3:15	12.15634
4/13/2018 3:30	12.15634
4/13/2018 3:45	12.26312
4/13/2018 4:00	12.6522
4/13/2018 4:15	13.43434
4/13/2018 4:30	15.01485
4/13/2018 4:45	15.38423
4/13/2018 5:00	18.36954
4/13/2018 5:15	15.52729
4/13/2018 5:30	15.29638
4/13/2018 5:45	15.4325
4/13/2018 6:00	14.60041
4/13/2018 6:15	13.17815
4/13/2018 6:30	13.17815
4/13/2018 6:45	13.2621
4/13/2018 7:00	13.2621
4/13/2018 7:15	27.32389
4/13/2018 7:30	30.717
4/13/2018 7:45	33.19292
4/13/2018 8:00	33.19292
4/13/2018 8:15	33.19292
4/13/2018 8:30	43.31551
4/13/2018 8:45	46.88019
4/13/2018 9:00	46.88019
4/13/2018 9:15	46.88019
4/13/2018 9:30	44.11909

Site 10 – MH 7.03 Flow Meter Data

4/13/2018 9:45	41.19883
4/13/2018 10:00	38.75881
4/13/2018 10:15	38.93685
4/13/2018 10:30	38.24157
4/13/2018 10:45	36.35929
4/13/2018 11:00	21.54552
4/13/2018 11:15	21.3677
4/13/2018 11:30	21.3677
4/13/2018 11:45	35.90601
4/13/2018 12:00	39.43666
4/13/2018 12:15	40.76545
4/13/2018 12:30	43.55973
4/13/2018 12:45	47.11344
4/13/2018 13:00	50.2258
4/13/2018 13:15	59.03497
4/13/2018 13:30	62.70062
4/13/2018 13:45	67.18851
4/13/2018 14:00	68.60938
4/13/2018 14:15	72.51768
4/13/2018 14:30	79.05354
4/13/2018 14:45	93.39439
4/13/2018 15:00	101.462
4/13/2018 15:15	101.462
4/13/2018 15:30	101.462
4/13/2018 15:45	103.0896
4/13/2018 16:00	99.5817
4/13/2018 16:15	107.053
4/13/2018 16:30	107.053
4/13/2018 16:45	129.6002
4/13/2018 17:00	129.6002
4/13/2018 17:15	142.7059
4/13/2018 17:30	110.534
4/13/2018 17:45	113.9313
4/13/2018 18:00	115.087
4/13/2018 18:15	114.9609
4/13/2018 18:30	114.9609
4/13/2018 18:45	118.2782
4/13/2018 19:00	118.9786
4/13/2018 19:15	116.3025
4/13/2018 19:30	114.1688
4/13/2018 19:45	122.2952
4/13/2018 20:00	113.7294
4/13/2018 20:15	103.0047
4/13/2018 20:30	87.41103
4/13/2018 20:45	83.6506
4/13/2018 21:00	71.11666
4/13/2018 21:15	47.60461
4/13/2018 21:30	47.60461
4/13/2018 21:45	47.46277
4/13/2018 22:00	45.97254
4/13/2018 22:15	46.0224
4/13/2018 22:30	46.0224
4/13/2018 22:45	44.09081
4/13/2018 23:00	44.09081
4/13/2018 23:15	43.46983
4/13/2018 23:30	43.13231
4/13/2018 23:45	42.50931
4/14/2018 0:00	43.42061
4/14/2018 0:15	43.42061
4/14/2018 0:30	44.7798
4/14/2018 0:45	45.07132
4/14/2018 1:00	45.36323
4/14/2018 1:15	45.95753
4/14/2018 1:30	45.33508
4/14/2018 1:45	45.33508
4/14/2018 2:00	45.6556
4/14/2018 2:15	45.6556
4/14/2018 2:30	45.04476
4/14/2018 2:45	45.36323
4/14/2018 3:00	45.2347
4/14/2018 3:15	45.2347
4/14/2018 3:30	44.14389
4/14/2018 3:45	44.73321
4/14/2018 4:00	43.8811
4/14/2018 4:15	44.4639
4/14/2018 4:30	44.46741
4/14/2018 4:45	44.46741
4/14/2018 5:00	43.89039
4/14/2018 5:15	43.87282
4/14/2018 5:30	43.58682
4/14/2018 5:45	43.87898
4/14/2018 6:00	43.55539
4/14/2018 6:15	43.87898
4/14/2018 6:30	44.25999
4/14/2018 6:45	44.25999
4/14/2018 7:00	43.31582
4/14/2018 7:15	42.99732
4/14/2018 7:30	42.99732
4/14/2018 7:45	42.99732
4/14/2018 8:00	43.0146
4/14/2018 8:15	43.21556
4/14/2018 8:30	42.92835
4/14/2018 8:45	41.6679
4/14/2018 9:00	41.37795
4/14/2018 9:15	41.92749
4/14/2018 9:30	41.02081

Site 10 – MH 7.03 Flow Meter Data

4/14/2018 9:45	41.63411
4/14/2018 10:00	41.25462
4/14/2018 10:15	41.35825
4/14/2018 10:30	39.98549
4/14/2018 10:45	39.43948
4/14/2018 11:00	40.83029
4/14/2018 11:15	40.54832
4/14/2018 11:30	41.45612
4/14/2018 11:45	41.7444
4/14/2018 12:00	41.7444
4/14/2018 12:15	41.19141
4/14/2018 12:30	41.19141
4/14/2018 12:45	41.19141
4/14/2018 13:00	36.69595
4/14/2018 13:15	36.69595
4/14/2018 13:30	36.12785
4/14/2018 13:45	36.12785
4/14/2018 14:00	35.35643
4/14/2018 14:15	33.29918
4/14/2018 14:30	32.56442
4/14/2018 14:45	36.16191
4/14/2018 15:00	35.89984
4/14/2018 15:15	35.04412
4/14/2018 15:30	35.30139
4/14/2018 15:45	35.30139
4/14/2018 16:00	34.48344
4/14/2018 16:15	34.6877
4/14/2018 16:30	35.23998
4/14/2018 16:45	36.07632
4/14/2018 17:00	36.07632
4/14/2018 17:15	36.07632
4/14/2018 17:30	34.66956
4/14/2018 17:45	29.91113
4/14/2018 18:00	27.21391
4/14/2018 18:15	27.21391
4/14/2018 18:30	29.56365
4/14/2018 18:45	30.05059
4/14/2018 19:00	36.15945
4/14/2018 19:15	36.15945
4/14/2018 19:30	32.77504
4/14/2018 19:45	32.77504
4/14/2018 20:00	32.00468
4/14/2018 20:15	30.9348
4/14/2018 20:30	30.9348
4/14/2018 20:45	30.67281
4/14/2018 21:00	28.09704
4/14/2018 21:15	26.72944
4/14/2018 21:30	26.08834
4/14/2018 21:45	26.31955
4/14/2018 22:00	26.5802
4/14/2018 22:15	26.15404
4/14/2018 22:30	26.41305
4/14/2018 22:45	26.93982
4/14/2018 23:00	26.41305
4/14/2018 23:15	26.93982
4/14/2018 23:30	26.93982
4/14/2018 23:45	26.15404
4/15/2018 0:00	25.41163
4/15/2018 0:15	25.64833
4/15/2018 0:30	25.64833
4/15/2018 0:45	25.64833
4/15/2018 1:00	26.80062
4/15/2018 1:15	26.80944
4/15/2018 1:30	27.29663
4/15/2018 1:45	26.56349
4/15/2018 2:00	26.60482
4/15/2018 2:15	26.60482
4/15/2018 2:30	25.8559
4/15/2018 2:45	25.42589
4/15/2018 3:00	24.45728
4/15/2018 3:15	25.42589
4/15/2018 3:30	25.93641
4/15/2018 3:45	26.19574
4/15/2018 4:00	26.91217
4/15/2018 4:15	26.91217
4/15/2018 4:30	26.40864
4/15/2018 4:45	25.88244
4/15/2018 5:00	26.29854
4/15/2018 5:15	26.29854
4/15/2018 5:30	26.50723
4/15/2018 5:45	26.81936
4/15/2018 6:00	27.56392
4/15/2018 6:15	27.3956
4/15/2018 6:30	27.65286
4/15/2018 6:45	27.65286
4/15/2018 7:00	27.65286
4/15/2018 7:15	27.65286
4/15/2018 7:30	29.40022
4/15/2018 7:45	29.59896
4/15/2018 8:00	29.59896
4/15/2018 8:15	30.67794
4/15/2018 8:30	30.24852
4/15/2018 8:45	28.23174
4/15/2018 9:00	28.67034
4/15/2018 9:15	28.37102
4/15/2018 9:30	28.19578

Site 10 – MH 7.03 Flow Meter Data

4/15/2018 9:45	28.32999
4/15/2018 10:00	28.32999
4/15/2018 10:15	27.54677
4/15/2018 10:30	27.53308
4/15/2018 10:45	27.0036
4/15/2018 11:00	26.38657
4/15/2018 11:15	26.91732
4/15/2018 11:30	26.07497
4/15/2018 11:45	26.60494
4/15/2018 12:00	27.33745
4/15/2018 12:15	27.33745
4/15/2018 12:30	26.61847
4/15/2018 12:45	27.14904
4/15/2018 13:00	26.93824
4/15/2018 13:15	27.34645
4/15/2018 13:30	27.34645
4/15/2018 13:45	27.36025
4/15/2018 14:00	27.4677
4/15/2018 14:15	26.39939
4/15/2018 14:30	26.76557
4/15/2018 14:45	26.55027
4/15/2018 15:00	24.85893
4/15/2018 15:15	22.15519
4/15/2018 15:30	22.5517
4/15/2018 15:45	22.5517
4/15/2018 16:00	23.76781
4/15/2018 16:15	27.04846
4/15/2018 16:30	27.04846
4/15/2018 16:45	26.6194
4/15/2018 17:00	27.06705
4/15/2018 17:15	24.65789
4/15/2018 17:30	24.59582
4/15/2018 17:45	24.59582
4/15/2018 18:00	23.35478
4/15/2018 18:15	22.59199
4/15/2018 18:30	22.59199
4/15/2018 18:45	22.39977
4/15/2018 19:00	22.39977
4/15/2018 19:15	22.93333
4/15/2018 19:30	22.46721
4/15/2018 19:45	21.90018
4/15/2018 20:00	21.90018
4/15/2018 20:15	22.24383
4/15/2018 20:30	22.24383
4/15/2018 20:45	23.75353
4/15/2018 21:00	24.96459
4/15/2018 21:15	26.14576
4/15/2018 21:30	24.98948
4/15/2018 21:45	25.72449
4/15/2018 22:00	25.73856
4/15/2018 22:15	37.24964
4/15/2018 22:30	38.75307
4/15/2018 22:45	39.46116
4/15/2018 23:00	43.92976
4/15/2018 23:15	47.83847
4/15/2018 23:30	47.83847
4/15/2018 23:45	47.83847
4/16/2018 0:00	45.8217
4/16/2018 0:15	45.75468
4/16/2018 0:30	44.95298
4/16/2018 0:45	45.50051
4/16/2018 1:00	44.74557
4/16/2018 1:15	41.77122
4/16/2018 1:30	41.43696
4/16/2018 1:45	40.6797
4/16/2018 2:00	24.69952
4/16/2018 2:15	24.46561
4/16/2018 2:30	24.46561
4/16/2018 2:45	23.48698
4/16/2018 3:00	21.31895
4/16/2018 3:15	23.48698
4/16/2018 3:30	20.97556
4/16/2018 3:45	19.44839
4/16/2018 4:00	23.66277
4/16/2018 4:15	31.20721
4/16/2018 4:30	33.86619
4/16/2018 4:45	35.7171
4/16/2018 5:00	36.15673
4/16/2018 5:15	36.38302
4/16/2018 5:30	40.81638
4/16/2018 5:45	42.30328
4/16/2018 6:00	43.24566
4/16/2018 6:15	43.24566
4/16/2018 6:30	28.60529
4/16/2018 6:45	25.52483
4/16/2018 7:00	25.12571
4/16/2018 7:15	23.80673
4/16/2018 7:30	25.02476
4/16/2018 7:45	25.18361
4/16/2018 8:00	26.46849
4/16/2018 8:15	25.18361
4/16/2018 8:30	26.46849
4/16/2018 8:45	26.59527
4/16/2018 9:00	26.76338
4/16/2018 9:15	23.2125
4/16/2018 9:30	25.46995

Site 10 – MH 7.03 Flow Meter Data

4/16/2018 9:45	24.37412
4/16/2018 10:00	24.37412
4/16/2018 10:15	24.68058
4/16/2018 10:30	24.68058
4/16/2018 10:45	24.75549
4/16/2018 11:00	25.06674
4/16/2018 11:15	23.95383
4/16/2018 11:30	23.7659
4/16/2018 11:45	26.15197
4/16/2018 12:00	26.20702
4/16/2018 12:15	27.16911
4/16/2018 12:30	27.16911
4/16/2018 12:45	27.16911
4/16/2018 13:00	27.65008
4/16/2018 13:15	25.3533
4/16/2018 13:30	25.3533
4/16/2018 13:45	26.59172
4/16/2018 14:00	26.90554
4/16/2018 14:15	26.90554
4/16/2018 14:30	41.92599
4/16/2018 14:45	41.31243
4/16/2018 15:00	41.31243
4/16/2018 15:15	40.95133
4/16/2018 15:30	40.95133
4/16/2018 15:45	42.95439
4/16/2018 16:00	44.71869
4/16/2018 16:15	46.63835
4/16/2018 16:30	47.55128
4/16/2018 16:45	46.63835
4/16/2018 17:00	44.21574
4/16/2018 17:15	43.49778
4/16/2018 17:30	27.87548
4/16/2018 17:45	27.44814
4/16/2018 18:00	27.44814
4/16/2018 18:15	27.66222
4/16/2018 18:30	27.23816
4/16/2018 18:45	27.23816
4/16/2018 19:00	26.04591
4/16/2018 19:15	26.04591
4/16/2018 19:30	25.7772
4/16/2018 19:45	25.57537
4/16/2018 20:00	25.86846
4/16/2018 20:15	26.44153
4/16/2018 20:30	26.44153
4/16/2018 20:45	26.2333
4/16/2018 21:00	26.2333
4/16/2018 21:15	26.10027
4/16/2018 21:30	26.10027
4/16/2018 21:45	26.92585
4/16/2018 22:00	26.92585
4/16/2018 22:15	25.84958
4/16/2018 22:30	25.84958
4/16/2018 22:45	25.03395
4/16/2018 23:00	24.8311
4/16/2018 23:15	27.00359
4/16/2018 23:30	27.19731
4/16/2018 23:45	26.97557
4/17/2018 0:00	26.82549
4/17/2018 0:15	26.76043
4/17/2018 0:30	26.54255
4/17/2018 0:45	26.54255
4/17/2018 1:00	25.83937
4/17/2018 1:15	24.87238
4/17/2018 1:30	26.84124
4/17/2018 1:45	25.60051
4/17/2018 2:00	25.60051
4/17/2018 2:15	25.60051
4/17/2018 2:30	25.92458
4/17/2018 2:45	25.50086
4/17/2018 3:00	26.13801
4/17/2018 3:15	25.50086
4/17/2018 3:30	25.50086
4/17/2018 3:45	25.20695
4/17/2018 4:00	25.20695
4/17/2018 4:15	25.20695
4/17/2018 4:30	25.49122
4/17/2018 4:45	25.49122
4/17/2018 5:00	25.63155
4/17/2018 5:15	24.63497
4/17/2018 5:30	24.13549
4/17/2018 5:45	24.13549
4/17/2018 6:00	24.15012
4/17/2018 6:15	24.34451
4/17/2018 6:30	25.82064
4/17/2018 6:45	25.83629
4/17/2018 7:00	25.7749
4/17/2018 7:15	22.85525
4/17/2018 7:30	23.46963
4/17/2018 7:45	23.12432
4/17/2018 8:00	23.87393
4/17/2018 8:15	24.29648
4/17/2018 8:30	24.29648
4/17/2018 8:45	24.90088
4/17/2018 9:00	24.29648
4/17/2018 9:15	22.25338
4/17/2018 9:30	25.97747

Site 10 – MH 7.03 Flow Meter Data

4/17/2018 9:45	25.97747
4/17/2018 10:00	25.97747
4/17/2018 10:15	25.97747
4/17/2018 10:30	25.73862
4/17/2018 10:45	25.73862
4/17/2018 11:00	26.44626
4/17/2018 11:15	25.98625
4/17/2018 11:30	25.98625
4/17/2018 11:45	26.23141
4/17/2018 12:00	26.61481
4/17/2018 12:15	24.22789
4/17/2018 12:30	24.15427
4/17/2018 12:45	23.75724
4/17/2018 13:00	23.56791
4/17/2018 13:15	23.73607
4/17/2018 13:30	26.78757
4/17/2018 13:45	42.29712
4/17/2018 14:00	43.16401
4/17/2018 14:15	45.61426
4/17/2018 14:30	42.63108
4/17/2018 14:45	26.78167
4/17/2018 15:00	25.94919
4/17/2018 15:15	25.02518
4/17/2018 15:30	23.59125
4/17/2018 15:45	21.02565
4/17/2018 16:00	20.88221
4/17/2018 16:15	19.50888
4/17/2018 16:30	19.47594
4/17/2018 16:45	17.93563
4/17/2018 17:00	18.29622
4/17/2018 17:15	18.29622
4/17/2018 17:30	16.44604
4/17/2018 17:45	18.79783
4/17/2018 18:00	21.81833
4/17/2018 18:15	24.15659
4/17/2018 18:30	24.15659
4/17/2018 18:45	24.77637
4/17/2018 19:00	24.15659
4/17/2018 19:15	23.85836
4/17/2018 19:30	23.36966
4/17/2018 19:45	23.96994
4/17/2018 20:00	19.2751
4/17/2018 20:15	21.84184
4/17/2018 20:30	21.29485
4/17/2018 20:45	21.84184
4/17/2018 21:00	19.4203
4/17/2018 21:15	20.39134
4/17/2018 21:30	19.4203
4/17/2018 21:45	18.98874
4/17/2018 22:00	18.65488
4/17/2018 22:15	18.96035
4/17/2018 22:30	18.78815
4/17/2018 22:45	20.20511
4/17/2018 23:00	20.40921
4/17/2018 23:15	20.40921
4/17/2018 23:30	20.86726
4/17/2018 23:45	20.24093
4/18/2018 0:00	21.02125
4/18/2018 0:15	21.21671
4/18/2018 0:30	22.6162
4/18/2018 0:45	22.22583
4/18/2018 1:00	22.60498
4/18/2018 1:15	21.73443
4/18/2018 1:30	21.58517
4/18/2018 1:45	21.42182
4/18/2018 2:00	21.42182
4/18/2018 2:15	20.96715
4/18/2018 2:30	22.54409
4/18/2018 2:45	21.87447
4/18/2018 3:00	21.87447
4/18/2018 3:15	20.22445
4/18/2018 3:30	18.86915
4/18/2018 3:45	18.2931
4/18/2018 4:00	18.2931
4/18/2018 4:15	17.24119
4/18/2018 4:30	17.24119
4/18/2018 4:45	17.24119
4/18/2018 5:00	18.1398
4/18/2018 5:15	18.1398
4/18/2018 5:30	18.1398
4/18/2018 5:45	20.20008
4/18/2018 6:00	20.20008
4/18/2018 6:15	20.89326
4/18/2018 6:30	20.80783
4/18/2018 6:45	20.80783
4/18/2018 7:00	19.94584
4/18/2018 7:15	19.49688
4/18/2018 7:30	19.49688
4/18/2018 7:45	19.92602
4/18/2018 8:00	21.98361
4/18/2018 8:15	22.76677
4/18/2018 8:30	23.21171
4/18/2018 8:45	20.7295
4/18/2018 9:00	21.0678
4/18/2018 9:15	20.7295
4/18/2018 9:30	20.51311

Site 10 – MH 7.03 Flow Meter Data

4/18/2018 9:45	20.84787
4/18/2018 10:00	20.66396
4/18/2018 10:15	20.22573
4/18/2018 10:30	21.402
4/18/2018 10:45	20.45823
4/18/2018 11:00	20.3378
4/18/2018 11:15	20.98409
4/18/2018 11:30	19.774
4/18/2018 11:45	20.25715
4/18/2018 12:00	20.09063
4/18/2018 12:15	20.09063
4/18/2018 12:30	19.74001
4/18/2018 12:45	19.53476
4/18/2018 13:00	18.5654
4/18/2018 13:15	18.5107
4/18/2018 13:30	18.30994
4/18/2018 13:45	17.47703
4/18/2018 14:00	17.47703
4/18/2018 14:15	18.11715
4/18/2018 14:30	17.14682
4/18/2018 14:45	18.09942
4/18/2018 15:00	19.42546
4/18/2018 15:15	20.93327
4/18/2018 15:30	21.89072
4/18/2018 15:45	21.89072
4/18/2018 16:00	21.83467
4/18/2018 16:15	16.33775
4/18/2018 16:30	21.67472
4/18/2018 16:45	21.06501
4/18/2018 17:00	21.06501
4/18/2018 17:15	22.81666
4/18/2018 17:30	22.81666
4/18/2018 17:45	21.70522
4/18/2018 18:00	19.28733
4/18/2018 18:15	19.28733
4/18/2018 18:30	18.10135
4/18/2018 18:45	18.10135
4/18/2018 19:00	20.91262
4/18/2018 19:15	21.63314
4/18/2018 19:30	21.8627
4/18/2018 19:45	19.63857
4/18/2018 20:00	21.8627
4/18/2018 20:15	19.09239
4/18/2018 20:30	17.29099
4/18/2018 20:45	17.13498
4/18/2018 21:00	19.9249
4/18/2018 21:15	16.63927
4/18/2018 21:30	16.57744
4/18/2018 21:45	14.19663
4/18/2018 22:00	13.42924
4/18/2018 22:15	13.32604
4/18/2018 22:30	13.07072
4/18/2018 22:45	12.22661
4/18/2018 23:00	13.15851
4/18/2018 23:15	14.93007
4/18/2018 23:30	13.42818
4/18/2018 23:45	14.69099
4/19/2018 0:00	14.69099
4/19/2018 0:15	13.55917
4/19/2018 0:30	13.43746
4/19/2018 0:45	12.94597
4/19/2018 1:00	12.35399
4/19/2018 1:15	11.9959
4/19/2018 1:30	11.98761
4/19/2018 1:45	11.9959
4/19/2018 2:00	12.11614
4/19/2018 2:15	12.87496
4/19/2018 2:30	12.87496
4/19/2018 2:45	12.87496
4/19/2018 3:00	12.49331
4/19/2018 3:15	11.75685
4/19/2018 3:30	11.75685
4/19/2018 3:45	12.24783
4/19/2018 4:00	13.97523
4/19/2018 4:15	16.62543
4/19/2018 4:30	18.07122
4/19/2018 4:45	18.07122
4/19/2018 5:00	15.10001
4/19/2018 5:15	16.25284
4/19/2018 5:30	18.26171
4/19/2018 5:45	15.41395
4/19/2018 6:00	19.20258
4/19/2018 6:15	19.20258
4/19/2018 6:30	16.0498
4/19/2018 6:45	13.73245
4/19/2018 7:00	12.80257
4/19/2018 7:15	12.64547
4/19/2018 7:30	12.90635
4/19/2018 7:45	13.44258
4/19/2018 8:00	16.02458
4/19/2018 8:15	16.18851
4/19/2018 8:30	16.68305
4/19/2018 8:45	16.68305
4/19/2018 9:00	15.80994
4/19/2018 9:15	15.93633
4/19/2018 9:30	16.61431

Site 10 – MH 7.03 Flow Meter Data

4/19/2018 9:45	18.0857
4/19/2018 10:00	18.0857
4/19/2018 10:15	18.0857
4/19/2018 10:30	18.0857
4/19/2018 10:45	18.63907
4/19/2018 11:00	19.22098
4/19/2018 11:15	21.26576
4/19/2018 11:30	21.26576
4/19/2018 11:45	21.26576
4/19/2018 12:00	18.92163
4/19/2018 12:15	18.66993
4/19/2018 12:30	18.14637
4/19/2018 12:45	15.02538
4/19/2018 13:00	14.46062
4/19/2018 13:15	14.46062
4/19/2018 13:30	13.34336
4/19/2018 13:45	13.08771
4/19/2018 14:00	12.01954
4/19/2018 14:15	11.848
4/19/2018 14:30	11.87466
4/19/2018 14:45	14.59889
4/19/2018 15:00	13.32037
4/19/2018 15:15	14.36938
4/19/2018 15:30	16.41312
4/19/2018 15:45	15.12418
4/19/2018 16:00	15.09525
4/19/2018 16:15	15.73146
4/19/2018 16:30	15.73146
4/19/2018 16:45	16.05007
4/19/2018 17:00	16.05007
4/19/2018 17:15	17.01505
4/19/2018 17:30	17.81004
4/19/2018 17:45	18.01015
4/19/2018 18:00	17.81004
4/19/2018 18:15	18.81815
4/19/2018 18:30	18.60906
4/19/2018 18:45	30.2226
4/19/2018 19:00	18.40934
4/19/2018 19:15	32.81396
4/19/2018 19:30	20.85835
4/19/2018 19:45	20.85835
4/19/2018 20:00	18.21222
4/19/2018 20:15	20.85835
4/19/2018 20:30	20.28489
4/19/2018 20:45	17.71786
4/19/2018 21:00	17.71786
4/19/2018 21:15	16.16306
4/19/2018 21:30	16.16306
4/19/2018 21:45	16.16306
4/19/2018 22:00	17.85423
4/19/2018 22:15	18.56079
4/19/2018 22:30	18.56079
4/19/2018 22:45	17.08589
4/19/2018 23:00	16.81024
4/19/2018 23:15	13.94942
4/19/2018 23:30	13.6342
4/19/2018 23:45	13.6342
4/20/2018 0:00	14.62342
4/20/2018 0:15	14.62342
4/20/2018 0:30	20.43242
4/20/2018 0:45	20.07354
4/20/2018 1:00	20.07354
4/20/2018 1:15	20.07354
4/20/2018 1:30	19.58988
4/20/2018 1:45	18.72396
4/20/2018 2:00	18.72396
4/20/2018 2:15	19.58988
4/20/2018 2:30	18.72396
4/20/2018 2:45	12.91089
4/20/2018 3:00	12.74947
4/20/2018 3:15	12.78441
4/20/2018 3:30	12.40697
4/20/2018 3:45	13.45214
4/20/2018 4:00	16.26173
4/20/2018 4:15	16.59109
4/20/2018 4:30	13.72459
4/20/2018 4:45	14.1092
4/20/2018 5:00	17.2319
4/20/2018 5:15	15.78869
4/20/2018 5:30	16.41427
4/20/2018 5:45	17.54337
4/20/2018 6:00	18.32942
4/20/2018 6:15	18.32942
4/20/2018 6:30	17.42865
4/20/2018 6:45	14.87508
4/20/2018 7:00	11.06308
4/20/2018 7:15	10.94158
4/20/2018 7:30	10.9759
4/20/2018 7:45	10.9759
4/20/2018 8:00	10.9759
4/20/2018 8:15	10.9759
4/20/2018 8:30	10.36642
4/20/2018 8:45	10.24981
4/20/2018 9:00	10.36642
4/20/2018 9:15	12.99962
4/20/2018 9:30	18.19935

Site 10 – MH 7.03 Flow Meter Data

4/20/2018 9:45	18.75938
4/20/2018 10:00	18.75938
4/20/2018 10:15	17.83184
4/20/2018 10:30	17.01008
4/20/2018 10:45	16.80375
4/20/2018 11:00	15.63139
4/20/2018 11:15	14.58326
4/20/2018 11:30	13.59525
4/20/2018 11:45	15.08482
4/20/2018 12:00	15.55974
4/20/2018 12:15	17.37681
4/20/2018 12:30	16.36633
4/20/2018 12:45	16.14754
4/20/2018 13:00	16.14754
4/20/2018 13:15	15.98393
4/20/2018 13:30	15.98393
4/20/2018 13:45	16.46803
4/20/2018 14:00	16.97608
4/20/2018 14:15	16.97608
4/20/2018 14:30	17.01434
4/20/2018 14:45	13.07543
4/20/2018 15:00	13.07543
4/20/2018 15:15	13.07543
4/20/2018 15:30	13.72533
4/20/2018 15:45	14.73098
4/20/2018 16:00	15.58049
4/20/2018 16:15	15.0501
4/20/2018 16:30	14.73098
4/20/2018 16:45	15.48907
4/20/2018 17:00	15.35863
4/20/2018 17:15	14.58887
4/20/2018 17:30	14.58887
4/20/2018 17:45	15.0315
4/20/2018 18:00	15.0315
4/20/2018 18:15	15.0315
4/20/2018 18:30	15.83767
4/20/2018 18:45	13.91483
4/20/2018 19:00	14.60047
4/20/2018 19:15	15.00449
4/20/2018 19:30	15.28972
4/20/2018 19:45	14.60047
4/20/2018 20:00	14.60047
4/20/2018 20:15	14.71087
4/20/2018 20:30	14.71087
4/20/2018 20:45	14.55892
4/20/2018 21:00	17.08292
4/20/2018 21:15	17.08292
4/20/2018 21:30	17.08292
4/20/2018 21:45	15.56083
4/20/2018 22:00	14.32587
4/20/2018 22:15	14.32587
4/20/2018 22:30	20.49502
4/20/2018 22:45	25.94476
4/20/2018 23:00	27.92766
4/20/2018 23:15	30.42632
4/20/2018 23:30	31.06834
4/20/2018 23:45	31.05469
4/21/2018 0:00	30.75398
4/21/2018 0:15	30.49491
4/21/2018 0:30	26.66063
4/21/2018 0:45	23.6244
4/21/2018 1:00	22.25019
4/21/2018 1:15	15.22328
4/21/2018 1:30	15.22328
4/21/2018 1:45	15.22328
4/21/2018 2:00	21.55586
4/21/2018 2:15	22.25142
4/21/2018 2:30	22.25142
4/21/2018 2:45	13.29785
4/21/2018 3:00	11.96709
4/21/2018 3:15	11.96709
4/21/2018 3:30	11.80316
4/21/2018 3:45	11.96709
4/21/2018 4:00	12.05169
4/21/2018 4:15	12.17994
4/21/2018 4:30	12.54154
4/21/2018 4:45	14.62682
4/21/2018 5:00	17.08701
4/21/2018 5:15	17.60707
4/21/2018 5:30	17.42552
4/21/2018 5:45	17.24452
4/21/2018 6:00	16.88405
4/21/2018 6:15	16.78522
4/21/2018 6:30	16.94508
4/21/2018 6:45	16.94508
4/21/2018 7:00	16.94508
4/21/2018 7:15	16.78522
4/21/2018 7:30	15.86281
4/21/2018 7:45	14.56015
4/21/2018 8:00	16.09275
4/21/2018 8:15	16.09275
4/21/2018 8:30	16.09275
4/21/2018 8:45	14.57136
4/21/2018 9:00	14.89647
4/21/2018 9:15	14.98185
4/21/2018 9:30	15.29129

Site 10 – MH 7.03 Flow Meter Data

4/21/2018 9:45	15.44666
4/21/2018 10:00	15.27515
4/21/2018 10:15	15.12261
4/21/2018 10:30	14.9705
4/21/2018 10:45	14.90559
4/21/2018 11:00	15.25862
4/21/2018 11:15	15.25862
4/21/2018 11:30	15.25862
4/21/2018 11:45	14.48649
4/21/2018 12:00	14.31702
4/21/2018 12:15	15.02444
4/21/2018 12:30	14.43035
4/21/2018 12:45	15.51887
4/21/2018 13:00	16.55439
4/21/2018 13:15	15.11757
4/21/2018 13:30	15.19226
4/21/2018 13:45	15.21602
4/21/2018 14:00	15.54118
4/21/2018 14:15	15.56549
4/21/2018 14:30	15.9933
4/21/2018 14:45	16.11416
4/21/2018 15:00	15.86153
4/21/2018 15:15	15.86153
4/21/2018 15:30	15.53201
4/21/2018 15:45	15.37296
4/21/2018 16:00	15.37296
4/21/2018 16:15	15.36257
4/21/2018 16:30	14.6423
4/21/2018 16:45	14.40786
4/21/2018 17:00	14.40786
4/21/2018 17:15	14.22846
4/21/2018 17:30	15.54143
4/21/2018 17:45	16.00724
4/21/2018 18:00	16.47079
4/21/2018 18:15	16.19007
4/21/2018 18:30	15.29013
4/21/2018 18:45	15.2043
4/21/2018 19:00	14.5781
4/21/2018 19:15	13.36186
4/21/2018 19:30	13.84374
4/21/2018 19:45	13.69812
4/21/2018 20:00	13.77514
4/21/2018 20:15	13.77514
4/21/2018 20:30	15.06192
4/21/2018 20:45	15.87491
4/21/2018 21:00	17.35854
4/21/2018 21:15	16.3683
4/21/2018 21:30	17.35854
4/21/2018 21:45	17.00922
4/21/2018 22:00	15.80221
4/21/2018 22:15	17.37407
4/21/2018 22:30	17.37407
4/21/2018 22:45	16.94239
4/21/2018 23:00	16.94239
4/21/2018 23:15	15.00338
4/21/2018 23:30	15.00338
4/21/2018 23:45	14.552
4/22/2018 0:00	14.83902
4/22/2018 0:15	14.85036
4/22/2018 0:30	14.52297
4/22/2018 0:45	14.04758
4/22/2018 1:00	12.24006
4/22/2018 1:15	12.06552
4/22/2018 1:30	12.06552
4/22/2018 1:45	12.06552
4/22/2018 2:00	11.67737
4/22/2018 2:15	13.77658
4/22/2018 2:30	14.81438
4/22/2018 2:45	20.70871
4/22/2018 3:00	20.95068
4/22/2018 3:15	20.95068
4/22/2018 3:30	18.21992
4/22/2018 3:45	17.17836
4/22/2018 4:00	12.55017
4/22/2018 4:15	16.67027
4/22/2018 4:30	14.8092
4/22/2018 4:45	16.67027
4/22/2018 5:00	15.00508
4/22/2018 5:15	14.84412
4/22/2018 5:30	14.76905
4/22/2018 5:45	14.92919
4/22/2018 6:00	13.91074
4/22/2018 6:15	14.49481
4/22/2018 6:30	14.98899
4/22/2018 6:45	15.11111
4/22/2018 7:00	16.01292
4/22/2018 7:15	17.61422
4/22/2018 7:30	17.61422
4/22/2018 7:45	17.61422
4/22/2018 8:00	16.0184
4/22/2018 8:15	16.65025
4/22/2018 8:30	16.26279
4/22/2018 8:45	17.63293
4/22/2018 9:00	18.3441
4/22/2018 9:15	16.56409
4/22/2018 9:30	16.56409

Site 10 – MH 7.03 Flow Meter Data

4/22/2018 9:45	16.56409
4/22/2018 10:00	15.39192
4/22/2018 10:15	14.29338
4/22/2018 10:30	14.29338
4/22/2018 10:45	13.91669
4/22/2018 11:00	13.77727
4/22/2018 11:15	13.75008
4/22/2018 11:30	13.75008
4/22/2018 11:45	13.96175
4/22/2018 12:00	13.96175
4/22/2018 12:15	13.9342
4/22/2018 12:30	13.73565
4/22/2018 12:45	13.73565
4/22/2018 13:00	13.93591
4/22/2018 13:15	15.256
4/22/2018 13:30	17.00869
4/22/2018 13:45	17.00869
4/22/2018 14:00	14.40338
4/22/2018 14:15	16.73342
4/22/2018 14:30	15.45427
4/22/2018 14:45	13.67436
4/22/2018 15:00	14.36055
4/22/2018 15:15	14.36055
4/22/2018 15:30	13.7471
4/22/2018 15:45	13.54944
4/22/2018 16:00	14.63074
4/22/2018 16:15	14.21784
4/22/2018 16:30	13.93705
4/22/2018 16:45	14.10097
4/22/2018 17:00	14.39197
4/22/2018 17:15	12.89275
4/22/2018 17:30	13.04922
4/22/2018 17:45	13.04922
4/22/2018 18:00	12.68315
4/22/2018 18:15	11.99399
4/22/2018 18:30	11.43607
4/22/2018 18:45	11.43607
4/22/2018 19:00	11.43607
4/22/2018 19:15	11.81761
4/22/2018 19:30	13.31345
4/22/2018 19:45	14.11465
4/22/2018 20:00	15.50936
4/22/2018 20:15	15.82771
4/22/2018 20:30	15.55849
4/22/2018 20:45	16.08383
4/22/2018 21:00	17.11557
4/22/2018 21:15	15.49879
4/22/2018 21:30	14.86457
4/22/2018 21:45	15.30546
4/22/2018 22:00	15.30546
4/22/2018 22:15	13.66712
4/22/2018 22:30	11.57408
4/22/2018 22:45	11.31643
4/22/2018 23:00	11.31643
4/22/2018 23:15	11.19576
4/22/2018 23:30	11.49848
4/22/2018 23:45	11.6599
4/23/2018 0:00	11.6599
4/23/2018 0:15	11.6599
4/23/2018 0:30	11.87539
4/23/2018 0:45	12.68781
4/23/2018 1:00	13.3024
4/23/2018 1:15	16.2784
4/23/2018 1:30	16.59145
4/23/2018 1:45	16.59145
4/23/2018 2:00	16.59145
4/23/2018 2:15	16.59533
4/23/2018 2:30	16.59533
4/23/2018 2:45	13.96925
4/23/2018 3:00	13.96925
4/23/2018 3:15	13.96925
4/23/2018 3:30	13.51375
4/23/2018 3:45	12.25263
4/23/2018 4:15	13.81297
4/23/2018 4:30	12.76876
4/23/2018 4:45	12.15938
4/23/2018 5:15	11.37475
4/23/2018 5:30	11.23049
4/23/2018 5:45	10.03788
4/23/2018 6:15	9.579469

Site 11 – MH 4.09 Flow Meter Data

Inst Time	Flow (gpm)
4/6/2018 11:15	9.682491
4/6/2018 11:30	22.26041
4/6/2018 11:45	13.87032
4/6/2018 12:00	16.00461
4/6/2018 12:15	16.74636
4/6/2018 12:30	16.51113
4/6/2018 12:45	14.85553
4/6/2018 13:00	16.08153
4/6/2018 13:15	16.83455
4/6/2018 13:30	16.83455
4/6/2018 13:45	16.56327
4/6/2018 14:00	16.56327
4/6/2018 14:15	16.74308
4/6/2018 14:30	16.55113
4/6/2018 14:45	16.55113
4/6/2018 15:00	16.26407
4/6/2018 15:15	16.26407
4/6/2018 15:30	13.83264
4/6/2018 15:45	13.82193
4/6/2018 16:00	15.8405
4/6/2018 16:15	15.82824
4/6/2018 16:30	17.49333
4/6/2018 16:45	17.49333
4/6/2018 17:00	21.40635
4/6/2018 17:15	18.76987
4/6/2018 17:30	14.78514
4/6/2018 17:45	14.78514
4/6/2018 18:00	9.765018
4/6/2018 18:15	9.364073
4/6/2018 18:30	13.28482
4/6/2018 18:45	13.8117
4/6/2018 19:00	13.8117
4/6/2018 19:15	13.8117
4/6/2018 19:30	9.250592
4/6/2018 19:45	9.126256
4/6/2018 20:00	8.09448
4/6/2018 20:15	7.798071
4/6/2018 20:30	8.60417
4/6/2018 20:45	7.294569
4/6/2018 21:00	7.294569
4/6/2018 21:15	7.294569
4/6/2018 21:30	7.294569
4/6/2018 21:45	7.279587
4/6/2018 22:00	7.279587
4/6/2018 22:15	7.465265
4/6/2018 22:30	6.43132
4/6/2018 22:45	5.988851
4/6/2018 23:00	5.988851
4/6/2018 23:15	6.0244
4/6/2018 23:30	4.763077
4/6/2018 23:45	4.763077
4/7/2018 0:00	5.762093
4/7/2018 0:15	5.180554
4/7/2018 0:30	0
4/7/2018 0:45	2.290469
4/7/2018 1:00	2.589187
4/7/2018 1:15	1.791998
4/7/2018 1:30	2.045719
4/7/2018 1:45	2.224718
4/7/2018 2:00	0
4/7/2018 2:15	0
4/7/2018 2:30	1.362804
4/7/2018 2:45	5.226252
4/7/2018 3:00	3.305968
4/7/2018 3:15	10.68522
4/7/2018 3:30	22.73396
4/7/2018 3:45	28.11345
4/7/2018 4:00	39.81629
4/7/2018 4:15	39.81629
4/7/2018 4:30	48.11275
4/7/2018 4:45	60.94845
4/7/2018 5:00	65.35134
4/7/2018 5:15	65.49377
4/7/2018 5:30	71.28373
4/7/2018 5:45	71.28373
4/7/2018 6:00	63.95841
4/7/2018 6:15	58.13719
4/7/2018 6:30	56.0115
4/7/2018 6:45	55.30794
4/7/2018 7:00	55.30794
4/7/2018 7:15	53.0798
4/7/2018 7:30	52.41206
4/7/2018 7:45	52.41206
4/7/2018 8:00	48.29572
4/7/2018 8:15	52.41206
4/7/2018 8:30	48.29572
4/7/2018 8:45	42.10366
4/7/2018 9:00	42.61049
4/7/2018 9:15	44.20071
4/7/2018 9:30	43.89043
4/7/2018 9:45	41.38248
4/7/2018 10:00	41.56469
4/7/2018 10:15	39.53049
4/7/2018 10:30	38.80235
4/7/2018 10:45	37.59043

Site 11 – MH 4.09 Flow Meter Data

4/7/2018 11:00	35.49635
4/7/2018 11:15	35.49635
4/7/2018 11:30	35.49635
4/7/2018 11:45	36.4041
4/7/2018 12:00	40.99506
4/7/2018 12:15	43.26054
4/7/2018 12:30	36.54496
4/7/2018 12:45	43.26054
4/7/2018 13:00	43.26054
4/7/2018 13:15	49.30693
4/7/2018 13:30	49.30693
4/7/2018 13:45	49.30693
4/7/2018 14:00	46.83335
4/7/2018 14:15	45.42257
4/7/2018 14:30	45.42257
4/7/2018 14:45	47.08237
4/7/2018 15:00	49.55039
4/7/2018 15:15	55.29127
4/7/2018 15:30	62.51155
4/7/2018 15:45	62.51155
4/7/2018 16:00	63.03619
4/7/2018 16:15	78.61336
4/7/2018 16:30	78.61336
4/7/2018 16:45	69.20255
4/7/2018 17:00	71.44612
4/7/2018 17:15	71.44612
4/7/2018 17:30	79.83799
4/7/2018 17:45	84.04175
4/7/2018 18:00	95.32035
4/7/2018 18:15	95.32035
4/7/2018 18:30	98.90981
4/7/2018 18:45	98.90981
4/7/2018 19:00	104.9713
4/7/2018 19:15	107.7409
4/7/2018 19:30	107.7409
4/7/2018 19:45	109.1167
4/7/2018 20:00	113.6642
4/7/2018 20:15	109.5328
4/7/2018 20:30	110.4755
4/7/2018 20:45	114.4408
4/7/2018 21:00	117.1329
4/7/2018 21:15	117.1329
4/7/2018 21:30	119.5737
4/7/2018 21:45	116.8254
4/7/2018 22:00	115.8543
4/7/2018 22:15	110.7132
4/7/2018 22:30	103.0102
4/7/2018 22:45	99.62491
4/7/2018 23:00	96.90614
4/7/2018 23:15	92.26221
4/7/2018 23:30	92.26221
4/7/2018 23:45	86.29412
4/8/2018 0:00	82.51514
4/8/2018 0:15	82.51514
4/8/2018 0:30	81.69392
4/8/2018 0:45	83.24549
4/8/2018 1:00	82.33941
4/8/2018 1:15	84.0217
4/8/2018 1:30	84.0217
4/8/2018 1:45	84.86633
4/8/2018 2:00	87.93188
4/8/2018 2:15	88.80949
4/8/2018 2:30	89.85278
4/8/2018 2:45	88.80949
4/8/2018 3:00	89.85278
4/8/2018 3:15	90.09877
4/8/2018 3:30	89.63208
4/8/2018 3:45	87.03815
4/8/2018 4:00	84.55415
4/8/2018 4:15	84.55415
4/8/2018 4:30	81.20686
4/8/2018 4:45	81.20686
4/8/2018 5:00	83.35114
4/8/2018 5:15	89.62433
4/8/2018 5:30	73.08995
4/8/2018 5:45	73.08995
4/8/2018 6:00	82.92591
4/8/2018 6:15	81.27991
4/8/2018 6:30	81.27991
4/8/2018 6:45	81.27991
4/8/2018 7:00	79.72086
4/8/2018 7:15	79.72086
4/8/2018 7:30	88.31323
4/8/2018 7:45	91.05575
4/8/2018 8:00	92.82152
4/8/2018 8:15	94.43224
4/8/2018 8:30	92.33188
4/8/2018 8:45	90.62055
4/8/2018 9:00	90.62055
4/8/2018 9:15	83.86263
4/8/2018 9:30	85.28178
4/8/2018 9:45	83.5865
4/8/2018 10:00	77.56535
4/8/2018 10:15	77.0669
4/8/2018 10:30	76.8476
4/8/2018 10:45	74.71734

Site 11 – MH 4.09 Flow Meter Data

4/8/2018 11:00	70.94816
4/8/2018 11:15	70.94816
4/8/2018 11:30	69.01381
4/8/2018 11:45	69.42509
4/8/2018 12:00	68.24395
4/8/2018 12:15	68.24395
4/8/2018 12:30	62.20859
4/8/2018 12:45	60.14604
4/8/2018 13:00	57.90641
4/8/2018 13:15	57.20904
4/8/2018 13:30	57.20904
4/8/2018 13:45	59.35773
4/8/2018 14:00	58.63675
4/8/2018 14:15	59.01853
4/8/2018 14:30	58.29533
4/8/2018 14:45	57.0365
4/8/2018 15:00	55.91796
4/8/2018 15:15	55.91796
4/8/2018 15:30	53.26376
4/8/2018 15:45	49.85563
4/8/2018 16:00	47.45535
4/8/2018 16:15	43.13108
4/8/2018 16:30	41.91804
4/8/2018 16:45	40.46124
4/8/2018 17:00	40.46124
4/8/2018 17:15	41.68201
4/8/2018 17:30	41.68201
4/8/2018 17:45	41.68201
4/8/2018 18:00	38.86293
4/8/2018 18:15	36.95222
4/8/2018 18:30	36.03644
4/8/2018 18:45	35.28103
4/8/2018 19:00	34.17977
4/8/2018 19:15	35.359
4/8/2018 19:30	35.359
4/8/2018 19:45	34.40084
4/8/2018 20:00	34.40084
4/8/2018 20:15	34.40084
4/8/2018 20:30	27.9083
4/8/2018 20:45	26.5999
4/8/2018 21:00	25.67913
4/8/2018 21:15	25.67913
4/8/2018 21:30	25.67913
4/8/2018 21:45	21.50515
4/8/2018 22:00	27.74242
4/8/2018 22:15	24.21036
4/8/2018 22:30	22.7816
4/8/2018 22:45	23.61104
4/8/2018 23:00	23.61104
4/8/2018 23:15	18.66039
4/8/2018 23:30	18.32237
4/8/2018 23:45	20.53186
4/9/2018 0:00	20.44359
4/9/2018 0:15	18.82219
4/9/2018 0:30	17.34241
4/9/2018 0:45	13.69489
4/9/2018 1:00	14.14561
4/9/2018 1:15	14.14561
4/9/2018 1:30	14.14561
4/9/2018 1:45	14.62033
4/9/2018 2:00	14.67986
4/9/2018 2:15	12.52996
4/9/2018 2:30	11.37959
4/9/2018 2:45	10.83967
4/9/2018 3:00	10.53605
4/9/2018 3:15	10.53605
4/9/2018 3:30	10.73068
4/9/2018 3:45	10.07887
4/9/2018 4:00	10.07887
4/9/2018 4:15	12.94253
4/9/2018 4:30	8.303916
4/9/2018 4:45	11.45138
4/9/2018 5:00	18.14748
4/9/2018 5:15	18.62936
4/9/2018 5:30	18.62936
4/9/2018 5:45	23.59499
4/9/2018 6:00	28.47398
4/9/2018 6:15	29.83638
4/9/2018 6:30	27.75681
4/9/2018 6:45	27.75681
4/9/2018 7:00	11.17412
4/9/2018 7:15	8.652906
4/9/2018 7:30	6.066041
4/9/2018 7:45	6.066041
4/9/2018 8:00	5.832291
4/9/2018 8:15	6.710656
4/9/2018 8:30	5.984425
4/9/2018 8:45	6.059186
4/9/2018 9:00	6.001049
4/9/2018 9:15	6.285511
4/9/2018 9:30	6.285511
4/9/2018 9:45	6.568193
4/9/2018 10:00	12.76908
4/9/2018 10:15	9.690878
4/9/2018 10:30	10.68208
4/9/2018 10:45	13.66955

Site 11 – MH 4.09 Flow Meter Data

4/9/2018 11:00	11.03889
4/9/2018 11:15	9.987041
4/9/2018 11:30	10.77391
4/9/2018 11:45	10.97996
4/9/2018 12:00	5.466961
4/9/2018 12:15	6.749416
4/9/2018 12:30	6.749416
4/9/2018 12:45	5.303173
4/9/2018 13:00	4.847538
4/9/2018 13:15	1.239069
4/9/2018 13:30	4.94393
4/9/2018 13:45	0
4/9/2018 14:00	5.284643
4/9/2018 14:15	0
4/9/2018 14:30	0
4/9/2018 14:45	0
4/9/2018 15:00	0
4/9/2018 15:15	0
4/9/2018 15:30	0
4/9/2018 15:45	0
4/9/2018 16:00	0
4/9/2018 16:15	0.40327
4/9/2018 16:30	0.583166
4/9/2018 16:45	0
4/9/2018 17:00	2.456483
4/9/2018 17:15	0
4/9/2018 17:30	0
4/9/2018 17:45	0
4/9/2018 18:00	0
4/9/2018 18:15	0
4/9/2018 18:30	0.004391
4/9/2018 18:45	0
4/9/2018 19:00	0
4/9/2018 19:15	0
4/9/2018 19:30	0
4/9/2018 19:45	0
4/9/2018 20:00	0
4/9/2018 20:15	0
4/9/2018 20:30	0
4/9/2018 20:45	5.968196
4/9/2018 21:00	3.580581
4/9/2018 21:15	3.936966
4/9/2018 21:30	4.907777
4/9/2018 21:45	4.907777
4/9/2018 22:00	0
4/9/2018 22:15	0
4/9/2018 22:30	0
4/9/2018 22:45	0
4/9/2018 23:00	0
4/9/2018 23:15	0
4/9/2018 23:30	0
4/9/2018 23:45	0
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4/10/2018 6:30	0
4/10/2018 6:45	0
4/10/2018 7:00	0
4/10/2018 7:15	0
4/10/2018 7:30	0
4/10/2018 7:45	0
4/10/2018 8:00	0
4/10/2018 8:15	0
4/10/2018 8:30	0.028837
4/10/2018 8:45	4.728908
4/10/2018 9:00	0
4/10/2018 9:15	2.863925
4/10/2018 9:30	4.224735
4/10/2018 9:45	0
4/10/2018 10:00	0.531524
4/10/2018 10:15	3.851791
4/10/2018 10:30	3.29968
4/10/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

4/10/2018 11:00	0
4/10/2018 11:15	0
4/10/2018 11:30	0
4/10/2018 11:45	0
4/10/2018 12:00	0
4/10/2018 12:15	0
4/10/2018 12:30	0
4/10/2018 12:45	0
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4/10/2018 13:15	0
4/10/2018 13:30	0
4/10/2018 13:45	0
4/10/2018 14:00	0
4/10/2018 14:15	0
4/10/2018 14:30	0
4/10/2018 14:45	0
4/10/2018 15:00	0
4/10/2018 15:15	0
4/10/2018 15:30	0
4/10/2018 15:45	0
4/10/2018 16:00	0
4/10/2018 16:15	0
4/10/2018 16:30	0
4/10/2018 16:45	0
4/10/2018 17:00	5.192709
4/10/2018 17:15	0
4/10/2018 17:30	0
4/10/2018 17:45	3.619128
4/10/2018 18:00	0
4/10/2018 18:15	0
4/10/2018 18:30	0
4/10/2018 18:45	7.589203
4/10/2018 19:00	4.959174
4/10/2018 19:15	6.94131
4/10/2018 19:30	0
4/10/2018 19:45	0
4/10/2018 20:00	0
4/10/2018 20:15	0
4/10/2018 20:30	0
4/10/2018 20:45	0
4/10/2018 21:00	0
4/10/2018 21:15	0
4/10/2018 21:30	0
4/10/2018 21:45	0
4/10/2018 22:00	0
4/10/2018 22:15	0
4/10/2018 22:30	0
4/10/2018 22:45	0
4/10/2018 23:00	0
4/10/2018 23:15	0
4/10/2018 23:30	0.783953
4/10/2018 23:45	0
4/11/2018 0:00	0.525721
4/11/2018 0:15	0
4/11/2018 0:30	0
4/11/2018 0:45	0
4/11/2018 1:00	0
4/11/2018 1:15	0
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4/11/2018 5:15	0
4/11/2018 5:30	0
4/11/2018 5:45	0
4/11/2018 6:00	0
4/11/2018 6:15	0
4/11/2018 6:30	0
4/11/2018 6:45	0
4/11/2018 7:00	2.161291
4/11/2018 7:15	6.24327
4/11/2018 7:30	0
4/11/2018 7:45	0
4/11/2018 8:00	0
4/11/2018 8:15	0
4/11/2018 8:30	0
4/11/2018 8:45	0
4/11/2018 9:00	4.411935
4/11/2018 9:15	5.909053
4/11/2018 9:30	5.909053
4/11/2018 9:45	5.683528
4/11/2018 10:00	5.683528
4/11/2018 10:15	12.50932
4/11/2018 10:30	11.62501
4/11/2018 10:45	12.70787

Site 11 – MH 4.09 Flow Meter Data

4/11/2018 11:00	12.25637
4/11/2018 11:15	10.7878
4/11/2018 11:30	8.782054
4/11/2018 11:45	8.118821
4/11/2018 12:00	7.049296
4/11/2018 12:15	6.792291
4/11/2018 12:30	6.792291
4/11/2018 12:45	7.473525
4/11/2018 13:00	8.135231
4/11/2018 13:15	7.530715
4/11/2018 13:30	7.625855
4/11/2018 13:45	7.530715
4/11/2018 14:00	7.509331
4/11/2018 14:15	9.682414
4/11/2018 14:30	11.41778
4/11/2018 14:45	9.682414
4/11/2018 15:00	7.30857
4/11/2018 15:15	8.953144
4/11/2018 15:30	8.953144
4/11/2018 15:45	9.088771
4/11/2018 16:00	10.8481
4/11/2018 16:15	13.08529
4/11/2018 16:30	13.55284
4/11/2018 16:45	13.55284
4/11/2018 17:00	15.10817
4/11/2018 17:15	15.10817
4/11/2018 17:30	15.10817
4/11/2018 17:45	9.515545
4/11/2018 18:00	9.515545
4/11/2018 18:15	9.515545
4/11/2018 18:30	13.65212
4/11/2018 18:45	26.90336
4/11/2018 19:00	29.23975
4/11/2018 19:15	23.81549
4/11/2018 19:30	7.563494
4/11/2018 19:45	8.906134
4/11/2018 20:00	8.6165
4/11/2018 20:15	8.906134
4/11/2018 20:30	8.574923
4/11/2018 20:45	8.619129
4/11/2018 21:00	9.209855
4/11/2018 21:15	8.78411
4/11/2018 21:30	6.998922
4/11/2018 21:45	6.971949
4/11/2018 22:00	6.971949
4/11/2018 22:15	6.971949
4/11/2018 22:30	6.23557
4/11/2018 22:45	5.965568
4/11/2018 23:00	5.683253
4/11/2018 23:15	4.595993
4/11/2018 23:30	4.595993
4/11/2018 23:45	0
4/12/2018 0:00	0
4/12/2018 0:15	0
4/12/2018 0:30	0
4/12/2018 0:45	0
4/12/2018 1:00	0
4/12/2018 1:15	0
4/12/2018 1:30	0
4/12/2018 1:45	0
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4/12/2018 5:00	0
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4/12/2018 6:00	0
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4/12/2018 9:30	0
4/12/2018 9:45	0
4/12/2018 10:00	0
4/12/2018 10:15	0
4/12/2018 10:30	0
4/12/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

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4/12/2018 11:30	0
4/12/2018 11:45	0
4/12/2018 12:00	0
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4/13/2018 0:45	0
4/13/2018 1:00	0
4/13/2018 1:15	0
4/13/2018 1:30	0
4/13/2018 1:45	0
4/13/2018 2:00	0
4/13/2018 2:15	0
4/13/2018 2:30	0
4/13/2018 2:45	0
4/13/2018 3:00	0
4/13/2018 3:15	0
4/13/2018 3:30	0
4/13/2018 3:45	0
4/13/2018 4:00	0
4/13/2018 4:15	0
4/13/2018 4:30	0
4/13/2018 4:45	0
4/13/2018 5:00	0
4/13/2018 5:15	0
4/13/2018 5:30	0
4/13/2018 5:45	0
4/13/2018 6:00	0
4/13/2018 6:15	0
4/13/2018 6:30	0
4/13/2018 6:45	0
4/13/2018 7:00	0
4/13/2018 7:15	0
4/13/2018 7:30	0
4/13/2018 7:45	0
4/13/2018 8:00	0
4/13/2018 8:15	1.278855
4/13/2018 8:30	2.195429
4/13/2018 8:45	5.379305
4/13/2018 9:00	7.27986
4/13/2018 9:15	9.183836
4/13/2018 9:30	13.1998
4/13/2018 9:45	13.44493
4/13/2018 10:00	15.37017
4/13/2018 10:15	17.84045
4/13/2018 10:30	19.93376
4/13/2018 10:45	23.61054

Site 11 – MH 4.09 Flow Meter Data

4/13/2018 11:00	19.11003
4/13/2018 11:15	19.11003
4/13/2018 11:30	18.98044
4/13/2018 11:45	18.14076
4/13/2018 12:00	17.82279
4/13/2018 12:15	18.23854
4/13/2018 12:30	18.23854
4/13/2018 12:45	24.35689
4/13/2018 13:00	30.39355
4/13/2018 13:15	32.28542
4/13/2018 13:30	42.99459
4/13/2018 13:45	44.21177
4/13/2018 14:00	52.09973
4/13/2018 14:15	53.0419
4/13/2018 14:30	53.69442
4/13/2018 14:45	99.46122
4/13/2018 15:00	114.7786
4/13/2018 15:15	117.6009
4/13/2018 15:30	127.3747
4/13/2018 15:45	141.946
4/13/2018 16:00	153.1068
4/13/2018 16:15	186.2835
4/13/2018 16:30	194.3712
4/13/2018 16:45	199.1396
4/13/2018 17:00	212.6658
4/13/2018 17:15	215.0767
4/13/2018 17:30	242.5015
4/13/2018 17:45	216.2843
4/13/2018 18:00	192.7378
4/13/2018 18:15	192.7378
4/13/2018 18:30	231.0734
4/13/2018 18:45	216.4088
4/13/2018 19:00	221.2075
4/13/2018 19:15	223.3223
4/13/2018 19:30	221.2075
4/13/2018 19:45	215.4293
4/13/2018 20:00	182.4317
4/13/2018 20:15	186.5837
4/13/2018 20:30	278.4547
4/13/2018 20:45	221.3519
4/13/2018 21:00	221.3519
4/13/2018 21:15	183.0951
4/13/2018 21:30	174.2886
4/13/2018 21:45	174.0777
4/13/2018 22:00	137.9155
4/13/2018 22:15	154.4364
4/13/2018 22:30	152.3969
4/13/2018 22:45	124.8539
4/13/2018 23:00	130.4023
4/13/2018 23:15	143.3975
4/13/2018 23:30	131.0536
4/13/2018 23:45	118.7981
4/14/2018 0:00	123.3677
4/14/2018 0:15	117.9608
4/14/2018 0:30	116.9946
4/14/2018 0:45	113.0541
4/14/2018 1:00	112.1708
4/14/2018 1:15	109.1553
4/14/2018 1:30	102.6195
4/14/2018 1:45	101.6141
4/14/2018 2:00	103.2988
4/14/2018 2:15	83.75568
4/14/2018 2:30	89.44993
4/14/2018 2:45	89.44993
4/14/2018 3:00	85.85662
4/14/2018 3:15	84.23236
4/14/2018 3:30	83.92989
4/14/2018 3:45	86.1722
4/14/2018 4:00	83.88437
4/14/2018 4:15	82.36816
4/14/2018 4:30	78.78854
4/14/2018 4:45	72.21397
4/14/2018 5:00	72.08472
4/14/2018 5:15	72.08472
4/14/2018 5:30	72.08472
4/14/2018 5:45	47.71514
4/14/2018 6:00	64.52647
4/14/2018 6:15	39.34313
4/14/2018 6:30	64.52647
4/14/2018 6:45	59.63052
4/14/2018 7:00	66.265
4/14/2018 7:15	66.265
4/14/2018 7:30	69.41911
4/14/2018 7:45	69.41911
4/14/2018 8:00	65.38071
4/14/2018 8:15	61.88837
4/14/2018 8:30	61.42703
4/14/2018 8:45	61.22227
4/14/2018 9:00	61.13333
4/14/2018 9:15	65.02268
4/14/2018 9:30	68.02837
4/14/2018 9:45	67.05865
4/14/2018 10:00	65.02268
4/14/2018 10:15	54.34557
4/14/2018 10:30	51.27556
4/14/2018 10:45	51.27556

Site 11 – MH 4.09 Flow Meter Data

4/14/2018 11:00	52.51824
4/14/2018 11:15	50.69497
4/14/2018 11:30	53.48351
4/14/2018 11:45	51.57945
4/14/2018 12:00	42.70728
4/14/2018 12:15	43.4934
4/14/2018 12:30	50.1069
4/14/2018 12:45	42.13027
4/14/2018 13:00	41.53082
4/14/2018 13:15	42.27644
4/14/2018 13:30	40.39997
4/14/2018 13:45	39.84274
4/14/2018 14:00	37.7924
4/14/2018 14:15	37.7924
4/14/2018 14:30	38.43327
4/14/2018 14:45	46.66534
4/14/2018 15:00	50.92737
4/14/2018 15:15	50.92737
4/14/2018 15:30	50.16899
4/14/2018 15:45	35.44495
4/14/2018 16:00	34.26733
4/14/2018 16:15	34.26733
4/14/2018 16:30	34.26733
4/14/2018 16:45	34.77719
4/14/2018 17:00	36.02435
4/14/2018 17:15	36.02435
4/14/2018 17:30	32.68891
4/14/2018 17:45	32.68891
4/14/2018 18:00	37.38338
4/14/2018 18:15	61.72002
4/14/2018 18:30	62.74806
4/14/2018 18:45	63.67344
4/14/2018 19:00	63.67344
4/14/2018 19:15	41.97293
4/14/2018 19:30	41.97293
4/14/2018 19:45	34.50941
4/14/2018 20:00	33.35962
4/14/2018 20:15	32.54817
4/14/2018 20:30	33.97017
4/14/2018 20:45	33.97017
4/14/2018 21:00	33.9227
4/14/2018 21:15	33.9227
4/14/2018 21:30	33.9227
4/14/2018 21:45	30.10278
4/14/2018 22:00	29.7062
4/14/2018 22:15	27.02661
4/14/2018 22:30	27.02661
4/14/2018 22:45	27.02661
4/14/2018 23:00	30.12294
4/14/2018 23:15	24.56004
4/14/2018 23:30	22.12083
4/14/2018 23:45	0
4/15/2018 0:00	13.06207
4/15/2018 0:15	23.40676
4/15/2018 0:30	0
4/15/2018 0:45	5.608702
4/15/2018 1:00	10.98757
4/15/2018 1:15	8.310816
4/15/2018 1:30	0
4/15/2018 1:45	0
4/15/2018 2:00	5.424333
4/15/2018 2:15	0
4/15/2018 2:30	0
4/15/2018 2:45	0
4/15/2018 3:00	0
4/15/2018 3:15	0
4/15/2018 3:30	0
4/15/2018 3:45	0
4/15/2018 4:00	0.803123
4/15/2018 4:15	0
4/15/2018 4:30	0
4/15/2018 4:45	0
4/15/2018 5:00	0
4/15/2018 5:15	0
4/15/2018 5:30	25.26338
4/15/2018 5:45	0
4/15/2018 6:00	3.819646
4/15/2018 6:15	10.96456
4/15/2018 6:30	9.10839
4/15/2018 6:45	10.96456
4/15/2018 7:00	29.32763
4/15/2018 7:15	0
4/15/2018 7:30	14.71927
4/15/2018 7:45	14.28462
4/15/2018 8:00	4.067157
4/15/2018 8:15	0
4/15/2018 8:30	3.191558
4/15/2018 8:45	5.00423
4/15/2018 9:00	18.99154
4/15/2018 9:15	20.66449
4/15/2018 9:30	27.17751
4/15/2018 9:45	30.74771
4/15/2018 10:00	33.31681
4/15/2018 10:15	0
4/15/2018 10:30	0
4/15/2018 10:45	18.18318

Site 11 – MH 4.09 Flow Meter Data

4/15/2018 11:00	11.726
4/15/2018 11:15	19.4321
4/15/2018 11:30	26.50719
4/15/2018 11:45	35.30147
4/15/2018 12:00	39.50402
4/15/2018 12:15	43.84122
4/15/2018 12:30	50.66839
4/15/2018 12:45	60.70034
4/15/2018 13:00	50.55433
4/15/2018 13:15	50.55433
4/15/2018 13:30	30.38139
4/15/2018 13:45	26.91937
4/15/2018 14:00	26.91937
4/15/2018 14:15	26.45971
4/15/2018 14:30	26.93818
4/15/2018 14:45	33.96709
4/15/2018 15:00	33.96709
4/15/2018 15:15	31.60948
4/15/2018 15:30	0
4/15/2018 15:45	0
4/15/2018 16:00	0
4/15/2018 16:15	0
4/15/2018 16:30	0
4/15/2018 16:45	0.951362
4/15/2018 17:00	0
4/15/2018 17:15	6.717567
4/15/2018 17:30	0
4/15/2018 17:45	4.382797
4/15/2018 18:00	0
4/15/2018 18:15	0
4/15/2018 18:30	0
4/15/2018 18:45	0
4/15/2018 19:00	0
4/15/2018 19:15	3.799171
4/15/2018 19:30	0
4/15/2018 19:45	0
4/15/2018 20:00	0
4/15/2018 20:15	0
4/15/2018 20:30	0
4/15/2018 20:45	0
4/15/2018 21:00	0
4/15/2018 21:15	0
4/15/2018 21:30	0
4/15/2018 21:45	0
4/15/2018 22:00	0
4/15/2018 22:15	1.599906
4/15/2018 22:30	0
4/15/2018 22:45	1.621581
4/15/2018 23:00	2.914519
4/15/2018 23:15	3.471701
4/15/2018 23:30	4.917049
4/15/2018 23:45	16.26942
4/16/2018 0:00	30.07125
4/16/2018 0:15	32.29245
4/16/2018 0:30	32.29245
4/16/2018 0:45	32.43428
4/16/2018 1:00	32.29245
4/16/2018 1:15	30.23508
4/16/2018 1:30	30.23508
4/16/2018 1:45	29.30642
4/16/2018 2:00	29.75657
4/16/2018 2:15	33.87895
4/16/2018 2:30	34.97503
4/16/2018 2:45	33.87895
4/16/2018 3:00	33.87895
4/16/2018 3:15	33.64679
4/16/2018 3:30	33.74677
4/16/2018 3:45	35.9208
4/16/2018 4:00	44.25164
4/16/2018 4:15	42.21676
4/16/2018 4:30	44.35814
4/16/2018 4:45	45.89132
4/16/2018 5:00	46.50787
4/16/2018 5:15	47.32501
4/16/2018 5:30	47.95482
4/16/2018 5:45	57.26141
4/16/2018 6:00	69.51112
4/16/2018 6:15	68.45264
4/16/2018 6:30	68.45264
4/16/2018 6:45	59.67821
4/16/2018 7:00	57.09201
4/16/2018 7:15	57.09201
4/16/2018 7:30	54.59418
4/16/2018 7:45	54.07343
4/16/2018 8:00	45.1174
4/16/2018 8:15	46.14447
4/16/2018 8:30	68.01916
4/16/2018 8:45	71.31979
4/16/2018 9:00	54.5362
4/16/2018 9:15	55.71778
4/16/2018 9:30	55.71778
4/16/2018 9:45	53.89153
4/16/2018 10:00	49.64874
4/16/2018 10:15	49.38033
4/16/2018 10:30	58.3009
4/16/2018 10:45	41.94912

Site 11 – MH 4.09 Flow Meter Data

4/16/2018 11:00	58.3009
4/16/2018 11:15	51.63685
4/16/2018 11:30	62.0428
4/16/2018 11:45	59.52885
4/16/2018 12:00	59.52885
4/16/2018 12:15	51.21072
4/16/2018 12:30	46.27969
4/16/2018 12:45	37.2876
4/16/2018 13:00	37.29388
4/16/2018 13:15	48.88882
4/16/2018 13:30	47.36869
4/16/2018 13:45	51.36471
4/16/2018 14:00	54.47992
4/16/2018 14:15	58.25423
4/16/2018 14:30	53.84159
4/16/2018 14:45	52.284
4/16/2018 15:00	55.89811
4/16/2018 15:15	48.56663
4/16/2018 15:30	48.56663
4/16/2018 15:45	46.07351
4/16/2018 16:00	47.50892
4/16/2018 16:15	43.04647
4/16/2018 16:30	46.34131
4/16/2018 16:45	46.34131
4/16/2018 17:00	48.33976
4/16/2018 17:15	48.33976
4/16/2018 17:30	50.39803
4/16/2018 17:45	50.52577
4/16/2018 18:00	54.95245
4/16/2018 18:15	55.4439
4/16/2018 18:30	65.13711
4/16/2018 18:45	65.13711
4/16/2018 19:00	58.38169
4/16/2018 19:15	49.04271
4/16/2018 19:30	49.04271
4/16/2018 19:45	48.87581
4/16/2018 20:00	48.24881
4/16/2018 20:15	55.92319
4/16/2018 20:30	52.87793
4/16/2018 20:45	49.51571
4/16/2018 21:00	38.46275
4/16/2018 21:15	48.26517
4/16/2018 21:30	40.08001
4/16/2018 21:45	42.51846
4/16/2018 22:00	48.25125
4/16/2018 22:15	51.57322
4/16/2018 22:30	51.57322
4/16/2018 22:45	42.87316
4/16/2018 23:00	39.00875
4/16/2018 23:15	37.3157
4/16/2018 23:30	37.3157
4/16/2018 23:45	37.35188
4/17/2018 0:00	38.27828
4/17/2018 0:15	37.71709
4/17/2018 0:30	37.27004
4/17/2018 0:45	35.31497
4/17/2018 1:00	28.82709
4/17/2018 1:15	28.82709
4/17/2018 1:30	25.527
4/17/2018 1:45	25.04673
4/17/2018 2:00	24.3415
4/17/2018 2:15	29.5142
4/17/2018 2:30	27.26204
4/17/2018 2:45	0
4/17/2018 3:00	0
4/17/2018 3:15	6.855853
4/17/2018 3:30	8.456217
4/17/2018 3:45	18.45263
4/17/2018 4:00	29.02832
4/17/2018 4:15	32.67551
4/17/2018 4:30	35.06637
4/17/2018 4:45	39.0238
4/17/2018 5:00	39.0238
4/17/2018 5:15	31.26391
4/17/2018 5:30	33.89051
4/17/2018 5:45	40.57722
4/17/2018 6:00	40.57722
4/17/2018 6:15	43.1659
4/17/2018 6:30	43.1659
4/17/2018 6:45	49.25204
4/17/2018 7:00	47.20791
4/17/2018 7:15	46.3377
4/17/2018 7:30	0
4/17/2018 7:45	17.7041
4/17/2018 8:00	35.4082
4/17/2018 8:15	0
4/17/2018 8:30	0
4/17/2018 8:45	0
4/17/2018 9:00	0
4/17/2018 9:15	0
4/17/2018 9:30	0
4/17/2018 9:45	0
4/17/2018 10:00	0
4/17/2018 10:15	0
4/17/2018 10:30	0
4/17/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

4/17/2018 11:00	0
4/17/2018 11:15	0
4/17/2018 11:30	0
4/17/2018 11:45	0
4/17/2018 12:00	0
4/17/2018 12:15	0
4/17/2018 12:30	0
4/17/2018 12:45	0
4/17/2018 13:00	0
4/17/2018 13:15	8.178295
4/17/2018 13:30	12.13706
4/17/2018 13:45	15.11457
4/17/2018 14:00	36.67083
4/17/2018 14:15	30.74051
4/17/2018 14:30	34.01676
4/17/2018 14:45	32.17681
4/17/2018 15:00	28.64121
4/17/2018 15:15	28.15314
4/17/2018 15:30	25.36857
4/17/2018 15:45	25.89086
4/17/2018 16:00	36.77999
4/17/2018 16:15	36.612
4/17/2018 16:30	33.69891
4/17/2018 16:45	34.98357
4/17/2018 17:00	33.41568
4/17/2018 17:15	33.41568
4/17/2018 17:30	36.53581
4/17/2018 17:45	39.31356
4/17/2018 18:00	38.7186
4/17/2018 18:15	38.5797
4/17/2018 18:30	38.5797
4/17/2018 18:45	34.24693
4/17/2018 19:00	33.71619
4/17/2018 19:15	33.23887
4/17/2018 19:30	35.323
4/17/2018 19:45	34.41444
4/17/2018 20:00	32.97054
4/17/2018 20:15	37.14799
4/17/2018 20:30	34.41444
4/17/2018 20:45	30.52689
4/17/2018 21:00	27.41618
4/17/2018 21:15	0
4/17/2018 21:30	0
4/17/2018 21:45	0
4/17/2018 22:00	0
4/17/2018 22:15	0
4/17/2018 22:30	0
4/17/2018 22:45	0
4/17/2018 23:00	12.99455
4/17/2018 23:15	0
4/17/2018 23:30	0
4/17/2018 23:45	0
4/18/2018 0:00	0
4/18/2018 0:15	0
4/18/2018 0:30	0
4/18/2018 0:45	0
4/18/2018 1:00	0
4/18/2018 1:15	0
4/18/2018 1:30	0
4/18/2018 1:45	0
4/18/2018 2:00	0
4/18/2018 2:15	0
4/18/2018 2:30	0
4/18/2018 2:45	0
4/18/2018 3:00	0
4/18/2018 3:15	0
4/18/2018 3:30	0
4/18/2018 3:45	0
4/18/2018 4:00	0
4/18/2018 4:15	0
4/18/2018 4:30	0
4/18/2018 4:45	0
4/18/2018 5:00	0
4/18/2018 5:15	0
4/18/2018 5:30	0
4/18/2018 5:45	0
4/18/2018 6:00	0
4/18/2018 6:15	0
4/18/2018 6:30	0
4/18/2018 6:45	0
4/18/2018 7:00	0
4/18/2018 7:15	0
4/18/2018 7:30	0
4/18/2018 7:45	0
4/18/2018 8:00	0
4/18/2018 8:15	0
4/18/2018 8:30	0
4/18/2018 8:45	0
4/18/2018 9:00	0
4/18/2018 9:15	0
4/18/2018 9:30	0
4/18/2018 9:45	0
4/18/2018 10:00	0
4/18/2018 10:15	0
4/18/2018 10:30	0
4/18/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

4/18/2018 11:00	0	4/18/2018 23:00	0
4/18/2018 11:15	0	4/18/2018 23:15	0
4/18/2018 11:30	0	4/18/2018 23:30	0
4/18/2018 11:45	0	4/18/2018 23:45	0
4/18/2018 12:00	0	4/19/2018 0:00	0
4/18/2018 12:15	0	4/19/2018 0:15	0
4/18/2018 12:30	0	4/19/2018 0:30	0
4/18/2018 12:45	0	4/19/2018 0:45	0
4/18/2018 13:00	0	4/19/2018 1:00	0
4/18/2018 13:15	0	4/19/2018 1:15	0
4/18/2018 13:30	0	4/19/2018 1:30	0
4/18/2018 13:45	0	4/19/2018 1:45	0
4/18/2018 14:00	0	4/19/2018 2:00	0
4/18/2018 14:15	0	4/19/2018 2:15	0
4/18/2018 14:30	0	4/19/2018 2:30	0
4/18/2018 14:45	0	4/19/2018 2:45	0
4/18/2018 15:00	0	4/19/2018 3:00	0
4/18/2018 15:15	0	4/19/2018 3:15	0
4/18/2018 15:30	0	4/19/2018 3:30	0
4/18/2018 15:45	0	4/19/2018 3:45	0
4/18/2018 16:00	0	4/19/2018 4:00	0
4/18/2018 16:15	0	4/19/2018 4:15	0
4/18/2018 16:30	0	4/19/2018 4:30	0
4/18/2018 16:45	0	4/19/2018 4:45	0
4/18/2018 17:00	0	4/19/2018 5:00	0
4/18/2018 17:15	0	4/19/2018 5:15	0
4/18/2018 17:30	0	4/19/2018 5:30	0
4/18/2018 17:45	0	4/19/2018 5:45	0
4/18/2018 18:00	0	4/19/2018 6:00	0
4/18/2018 18:15	0	4/19/2018 6:15	0
4/18/2018 18:30	0	4/19/2018 6:30	0
4/18/2018 18:45	0	4/19/2018 6:45	0
4/18/2018 19:00	0	4/19/2018 7:00	0
4/18/2018 19:15	0	4/19/2018 7:15	0
4/18/2018 19:30	20.71978	4/19/2018 7:30	0
4/18/2018 19:45	0	4/19/2018 7:45	0
4/18/2018 20:00	0	4/19/2018 8:00	0
4/18/2018 20:15	0	4/19/2018 8:15	0
4/18/2018 20:30	0	4/19/2018 8:30	0
4/18/2018 20:45	0	4/19/2018 8:45	0
4/18/2018 21:00	0	4/19/2018 9:00	0
4/18/2018 21:15	0	4/19/2018 9:15	0
4/18/2018 21:30	0	4/19/2018 9:30	0
4/18/2018 21:45	0	4/19/2018 9:45	0
4/18/2018 22:00	0	4/19/2018 10:00	0
4/18/2018 22:15	0	4/19/2018 10:15	0
4/18/2018 22:30	0	4/19/2018 10:30	0
4/18/2018 22:45	0	4/19/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

4/19/2018 11:00	0	4/19/2018 23:00	0
4/19/2018 11:15	0	4/19/2018 23:15	0
4/19/2018 11:30	0	4/19/2018 23:30	0
4/19/2018 11:45	0	4/19/2018 23:45	0
4/19/2018 12:00	0	4/20/2018 0:00	0
4/19/2018 12:15	0	4/20/2018 0:15	0
4/19/2018 12:30	0	4/20/2018 0:30	0
4/19/2018 12:45	0	4/20/2018 0:45	0
4/19/2018 13:00	0	4/20/2018 1:00	0
4/19/2018 13:15	0	4/20/2018 1:15	0
4/19/2018 13:30	0	4/20/2018 1:30	0
4/19/2018 13:45	0	4/20/2018 1:45	0
4/19/2018 14:00	0	4/20/2018 2:00	0
4/19/2018 14:15	0	4/20/2018 2:15	0
4/19/2018 14:30	0	4/20/2018 2:30	0
4/19/2018 14:45	0	4/20/2018 2:45	0
4/19/2018 15:00	0	4/20/2018 3:00	0
4/19/2018 15:15	0	4/20/2018 3:15	0
4/19/2018 15:30	0	4/20/2018 3:30	0
4/19/2018 15:45	0	4/20/2018 3:45	0
4/19/2018 16:00	0	4/20/2018 4:00	0
4/19/2018 16:15	0	4/20/2018 4:15	0
4/19/2018 16:30	0	4/20/2018 4:30	0
4/19/2018 16:45	0	4/20/2018 4:45	0
4/19/2018 17:00	0	4/20/2018 5:00	0
4/19/2018 17:15	0	4/20/2018 5:15	0
4/19/2018 17:30	0	4/20/2018 5:30	0
4/19/2018 17:45	0	4/20/2018 5:45	0
4/19/2018 18:00	0	4/20/2018 6:00	0
4/19/2018 18:15	0	4/20/2018 6:15	0
4/19/2018 18:30	0	4/20/2018 6:30	0
4/19/2018 18:45	0	4/20/2018 6:45	0
4/19/2018 19:00	0	4/20/2018 7:00	0
4/19/2018 19:15	0	4/20/2018 7:15	0
4/19/2018 19:30	0	4/20/2018 7:30	0
4/19/2018 19:45	0	4/20/2018 7:45	0
4/19/2018 20:00	0	4/20/2018 8:00	0
4/19/2018 20:15	0	4/20/2018 8:15	0
4/19/2018 20:30	0	4/20/2018 8:30	0
4/19/2018 20:45	0	4/20/2018 8:45	0
4/19/2018 21:00	0	4/20/2018 9:00	0
4/19/2018 21:15	0	4/20/2018 9:15	0
4/19/2018 21:30	0	4/20/2018 9:30	0
4/19/2018 21:45	0	4/20/2018 9:45	0
4/19/2018 22:00	0	4/20/2018 10:00	0
4/19/2018 22:15	0	4/20/2018 10:15	0
4/19/2018 22:30	0	4/20/2018 10:30	0
4/19/2018 22:45	0	4/20/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

4/20/2018 11:00	0	4/20/2018 23:00	0
4/20/2018 11:15	0	4/20/2018 23:15	0
4/20/2018 11:30	0	4/20/2018 23:30	0
4/20/2018 11:45	0	4/20/2018 23:45	0
4/20/2018 12:00	0	4/21/2018 0:00	0
4/20/2018 12:15	0	4/21/2018 0:15	0
4/20/2018 12:30	0	4/21/2018 0:30	0
4/20/2018 12:45	0	4/21/2018 0:45	0
4/20/2018 13:00	0	4/21/2018 1:00	0
4/20/2018 13:15	0	4/21/2018 1:15	0
4/20/2018 13:30	0	4/21/2018 1:30	0
4/20/2018 13:45	0	4/21/2018 1:45	0
4/20/2018 14:00	0	4/21/2018 2:00	0
4/20/2018 14:15	0	4/21/2018 2:15	0
4/20/2018 14:30	0	4/21/2018 2:30	0
4/20/2018 14:45	0	4/21/2018 2:45	0
4/20/2018 15:00	0	4/21/2018 3:00	0
4/20/2018 15:15	0	4/21/2018 3:15	0
4/20/2018 15:30	0	4/21/2018 3:30	0
4/20/2018 15:45	0	4/21/2018 3:45	0
4/20/2018 16:00	0	4/21/2018 4:00	0
4/20/2018 16:15	0	4/21/2018 4:15	0
4/20/2018 16:30	0	4/21/2018 4:30	0
4/20/2018 16:45	0	4/21/2018 4:45	0
4/20/2018 17:00	0	4/21/2018 5:00	0
4/20/2018 17:15	0	4/21/2018 5:15	0
4/20/2018 17:30	0	4/21/2018 5:30	0
4/20/2018 17:45	0	4/21/2018 5:45	0
4/20/2018 18:00	0	4/21/2018 6:00	0
4/20/2018 18:15	0	4/21/2018 6:15	0
4/20/2018 18:30	0	4/21/2018 6:30	0
4/20/2018 18:45	0	4/21/2018 6:45	0
4/20/2018 19:00	0	4/21/2018 7:00	0
4/20/2018 19:15	0	4/21/2018 7:15	0
4/20/2018 19:30	0	4/21/2018 7:30	0
4/20/2018 19:45	0	4/21/2018 7:45	0
4/20/2018 20:00	0	4/21/2018 8:00	0
4/20/2018 20:15	0	4/21/2018 8:15	0
4/20/2018 20:30	0	4/21/2018 8:30	0
4/20/2018 20:45	0	4/21/2018 8:45	0
4/20/2018 21:00	0	4/21/2018 9:00	0
4/20/2018 21:15	0	4/21/2018 9:15	0
4/20/2018 21:30	0	4/21/2018 9:30	0
4/20/2018 21:45	0	4/21/2018 9:45	0
4/20/2018 22:00	0	4/21/2018 10:00	0
4/20/2018 22:15	0	4/21/2018 10:15	0
4/20/2018 22:30	0	4/21/2018 10:30	0
4/20/2018 22:45	0	4/21/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

4/21/2018 11:00	0	4/21/2018 23:00	0
4/21/2018 11:15	0	4/21/2018 23:15	0
4/21/2018 11:30	0	4/21/2018 23:30	0
4/21/2018 11:45	0	4/21/2018 23:45	0
4/21/2018 12:00	0	4/22/2018 0:00	0
4/21/2018 12:15	0	4/22/2018 0:15	0
4/21/2018 12:30	0	4/22/2018 0:30	0
4/21/2018 12:45	0	4/22/2018 0:45	0
4/21/2018 13:00	0	4/22/2018 1:00	0
4/21/2018 13:15	0	4/22/2018 1:15	0
4/21/2018 13:30	0	4/22/2018 1:30	0
4/21/2018 13:45	0	4/22/2018 1:45	0
4/21/2018 14:00	0	4/22/2018 2:00	0
4/21/2018 14:15	0	4/22/2018 2:15	0
4/21/2018 14:30	0	4/22/2018 2:30	0
4/21/2018 14:45	0	4/22/2018 2:45	0
4/21/2018 15:00	0	4/22/2018 3:00	0
4/21/2018 15:15	0	4/22/2018 3:15	0
4/21/2018 15:30	0	4/22/2018 3:30	0
4/21/2018 15:45	0	4/22/2018 3:45	0
4/21/2018 16:00	0	4/22/2018 4:00	0
4/21/2018 16:15	0	4/22/2018 4:15	0
4/21/2018 16:30	0	4/22/2018 4:30	0
4/21/2018 16:45	0	4/22/2018 4:45	0
4/21/2018 17:00	0	4/22/2018 5:00	0
4/21/2018 17:15	0	4/22/2018 5:15	0
4/21/2018 17:30	0	4/22/2018 5:30	0
4/21/2018 17:45	0	4/22/2018 5:45	0
4/21/2018 18:00	0	4/22/2018 6:00	0
4/21/2018 18:15	0	4/22/2018 6:15	0
4/21/2018 18:30	0	4/22/2018 6:30	0
4/21/2018 18:45	0	4/22/2018 6:45	0
4/21/2018 19:00	0	4/22/2018 7:00	0
4/21/2018 19:15	0	4/22/2018 7:15	0
4/21/2018 19:30	0	4/22/2018 7:30	0
4/21/2018 19:45	0	4/22/2018 7:45	0
4/21/2018 20:00	0	4/22/2018 8:00	0
4/21/2018 20:15	0	4/22/2018 8:15	0
4/21/2018 20:30	0	4/22/2018 8:30	0
4/21/2018 20:45	0	4/22/2018 8:45	0
4/21/2018 21:00	0	4/22/2018 9:00	0
4/21/2018 21:15	0	4/22/2018 9:15	0
4/21/2018 21:30	0	4/22/2018 9:30	0
4/21/2018 21:45	0	4/22/2018 9:45	0
4/21/2018 22:00	0	4/22/2018 10:00	0
4/21/2018 22:15	0	4/22/2018 10:15	0
4/21/2018 22:30	0	4/22/2018 10:30	0
4/21/2018 22:45	0	4/22/2018 10:45	0

Site 11 – MH 4.09 Flow Meter Data

4/22/2018 11:00	0
4/22/2018 11:15	0
4/22/2018 11:30	0
4/22/2018 11:45	0
4/22/2018 12:00	0
4/22/2018 12:15	0
4/22/2018 12:30	0
4/22/2018 12:45	0
4/22/2018 13:00	0
4/22/2018 13:15	0
4/22/2018 13:30	0
4/22/2018 13:45	0
4/22/2018 14:00	0
4/22/2018 14:15	0
4/22/2018 14:30	0
4/22/2018 14:45	0
4/22/2018 15:00	0
4/22/2018 15:15	0
4/22/2018 15:30	0
4/22/2018 15:45	0
4/22/2018 16:00	0
4/22/2018 16:15	0
4/22/2018 16:30	0
4/22/2018 16:45	0
4/22/2018 17:00	0
4/22/2018 17:15	0
4/22/2018 17:30	0
4/22/2018 17:45	0
4/22/2018 18:00	0
4/22/2018 18:15	0
4/22/2018 18:30	0
4/22/2018 18:45	0
4/22/2018 19:00	0
4/22/2018 19:15	0
4/22/2018 19:30	0
4/22/2018 19:45	0
4/22/2018 20:00	0
4/22/2018 20:15	0
4/22/2018 20:30	0
4/22/2018 20:45	0
4/22/2018 21:00	0
4/22/2018 21:15	0
4/22/2018 21:30	0
4/22/2018 21:45	0
4/22/2018 22:00	0
4/22/2018 22:15	0
4/22/2018 22:30	0
4/22/2018 22:45	0
4/22/2018 23:00	0
4/22/2018 23:15	0
4/22/2018 23:30	0
4/22/2018 23:45	0
4/23/2018 0:00	0
4/23/2018 0:15	0
4/23/2018 0:30	0
4/23/2018 0:45	0
4/23/2018 1:00	0
4/23/2018 1:15	0
4/23/2018 1:30	0
4/23/2018 1:45	0
4/23/2018 2:00	0
4/23/2018 2:15	0
4/23/2018 2:30	0
4/23/2018 2:45	0
4/23/2018 3:00	0
4/23/2018 3:15	0
4/23/2018 3:30	0
4/23/2018 3:45	0
4/23/2018 4:15	0
4/23/2018 4:30	0
4/23/2018 4:45	0
4/23/2018 5:15	0
4/23/2018 5:30	0
4/23/2018 5:45	0
4/23/2018 6:15	0

Site 12 – MH 7.05 Flow Meter Data

Inst Time	Flow 3 (gpm)
4/6/2018 13:00	2.016882
4/6/2018 13:15	1.847863
4/6/2018 13:30	1.619736
4/6/2018 13:45	1.690867
4/6/2018 14:00	1.672527
4/6/2018 14:15	1.875002
4/6/2018 14:30	4.14204
4/6/2018 14:45	13.7746
4/6/2018 15:00	14.77041
4/6/2018 15:15	4.436846
4/6/2018 15:30	4.39429
4/6/2018 15:45	4.09517
4/6/2018 16:00	3.702871
4/6/2018 16:15	3.504675
4/6/2018 16:30	2.384756
4/6/2018 16:45	2.384756
4/6/2018 17:00	2.054544
4/6/2018 17:15	1.986208
4/6/2018 17:30	0
4/6/2018 17:45	0
4/6/2018 18:00	0
4/6/2018 18:15	0
4/6/2018 18:30	0
4/6/2018 18:45	0
4/6/2018 19:00	0
4/6/2018 19:15	0
4/6/2018 19:30	0
4/6/2018 19:45	0
4/6/2018 20:00	0
4/6/2018 20:15	0
4/6/2018 20:30	0
4/6/2018 20:45	0
4/6/2018 21:00	0
4/6/2018 21:15	0
4/6/2018 21:30	0
4/6/2018 21:45	4.684884
4/6/2018 22:00	4.684884
4/6/2018 22:15	7.490778
4/6/2018 22:30	4.684884
4/6/2018 22:45	1.431942
4/6/2018 23:00	1.431942
4/6/2018 23:15	4.483232
4/6/2018 23:30	4.483232
4/6/2018 23:45	6.475464
4/7/2018 0:00	7.384022
4/7/2018 0:15	5.339462
4/7/2018 0:30	3.789434
4/7/2018 0:45	3.789434
4/7/2018 1:00	3.789434
4/7/2018 1:15	3.500955
4/7/2018 1:30	3.367426
4/7/2018 1:45	3.360327
4/7/2018 2:00	3.360327
4/7/2018 2:15	3.367426
4/7/2018 2:30	3.876799
4/7/2018 2:45	4.10125
4/7/2018 3:00	3.941883
4/7/2018 3:15	3.921768
4/7/2018 3:30	3.921768
4/7/2018 3:45	3.938537
4/7/2018 4:00	3.938537
4/7/2018 4:15	4.800823
4/7/2018 4:30	8.176227
4/7/2018 4:45	8.176227
4/7/2018 5:00	7.049787
4/7/2018 5:15	6.66154
4/7/2018 5:30	6.944752
4/7/2018 5:45	6.34201
4/7/2018 6:00	6.310343
4/7/2018 6:15	6.310343
4/7/2018 6:30	6.310343
4/7/2018 6:45	6.81673
4/7/2018 7:00	6.81673
4/7/2018 7:15	7.105501
4/7/2018 7:30	6.932111
4/7/2018 7:45	6.704031
4/7/2018 8:00	11.42453
4/7/2018 8:15	9.648413
4/7/2018 8:30	8.597113
4/7/2018 8:45	5.177257
4/7/2018 9:00	5.584915
4/7/2018 9:15	4.33261
4/7/2018 9:30	4.461549
4/7/2018 9:45	4.947153
4/7/2018 10:00	6.7954
4/7/2018 10:15	5.705292
4/7/2018 10:30	5.705292
4/7/2018 10:45	4.025356
4/7/2018 11:00	3.914389
4/7/2018 11:15	3.610771
4/7/2018 11:30	3.569512
4/7/2018 11:45	3.610771
4/7/2018 12:00	5.723447
4/7/2018 12:15	5.737077
4/7/2018 12:30	6.085038

Site 12 – MH 7.05 Flow Meter Data

4/7/2018 12:45	6.182543	4/8/2018 0:45	12.02323
4/7/2018 13:00	6.354331	4/8/2018 1:00	12.73717
4/7/2018 13:15	6.145864	4/8/2018 1:15	13.40336
4/7/2018 13:30	6.145864	4/8/2018 1:30	13.57152
4/7/2018 13:45	6.188175	4/8/2018 1:45	16.22599
4/7/2018 14:00	6.188175	4/8/2018 2:00	16.38275
4/7/2018 14:15	6.188175	4/8/2018 2:15	14.24928
4/7/2018 14:30	6.215012	4/8/2018 2:30	14.24928
4/7/2018 14:45	4.984693	4/8/2018 2:45	14.43036
4/7/2018 15:00	5.63098	4/8/2018 3:00	12.71293
4/7/2018 15:15	5.63098	4/8/2018 3:15	14.43036
4/7/2018 15:30	6.174295	4/8/2018 3:30	14.25928
4/7/2018 15:45	7.152552	4/8/2018 3:45	13.38348
4/7/2018 16:00	9.312737	4/8/2018 4:00	13.38348
4/7/2018 16:15	9.401761	4/8/2018 4:15	13.38348
4/7/2018 16:30	9.401761	4/8/2018 4:30	13.87221
4/7/2018 16:45	8.804511	4/8/2018 4:45	14.35702
4/7/2018 17:00	8.565418	4/8/2018 5:00	15.41727
4/7/2018 17:15	8.799304	4/8/2018 5:15	14.35702
4/7/2018 17:30	8.66685	4/8/2018 5:30	15.77784
4/7/2018 17:45	9.782105	4/8/2018 5:45	15.9525
4/7/2018 18:00	10.25607	4/8/2018 6:00	15.9525
4/7/2018 18:15	11.97328	4/8/2018 6:15	20.7378
4/7/2018 18:30	13.78721	4/8/2018 6:30	19.87987
4/7/2018 18:45	15.46014	4/8/2018 6:45	19.63514
4/7/2018 19:00	16.16678	4/8/2018 7:00	19.15385
4/7/2018 19:15	16.16678	4/8/2018 7:15	19.63514
4/7/2018 19:30	14.69448	4/8/2018 7:30	19.04221
4/7/2018 19:45	16.16678	4/8/2018 7:45	22.54833
4/7/2018 20:00	14.69448	4/8/2018 8:00	21.82115
4/7/2018 20:15	13.72308	4/8/2018 8:15	25.00253
4/7/2018 20:30	12.23031	4/8/2018 8:30	24.53945
4/7/2018 20:45	14.22285	4/8/2018 8:45	17.7533
4/7/2018 21:00	13.81965	4/8/2018 9:00	17.7533
4/7/2018 21:15	13.90549	4/8/2018 9:15	23.01048
4/7/2018 21:30	14.01885	4/8/2018 9:30	17.00255
4/7/2018 21:45	13.38005	4/8/2018 9:45	17.64447
4/7/2018 22:00	13.81965	4/8/2018 10:00	13.25288
4/7/2018 22:15	13.7193	4/8/2018 10:15	13.25288
4/7/2018 22:30	13.04206	4/8/2018 10:30	11.48236
4/7/2018 22:45	12.13264	4/8/2018 10:45	11.23417
4/7/2018 23:00	12.13264	4/8/2018 11:00	11.23417
4/7/2018 23:15	9.955299	4/8/2018 11:15	10.11975
4/7/2018 23:30	9.563114	4/8/2018 11:30	10.47121
4/7/2018 23:45	9.563114	4/8/2018 11:45	10.52451
4/8/2018 0:00	9.563114	4/8/2018 12:00	10.50278
4/8/2018 0:15	10.05437	4/8/2018 12:15	10.21826
4/8/2018 0:30	11.86471	4/8/2018 12:30	12.14936

Site 12 – MH 7.05 Flow Meter Data

4/8/2018 12:45	11.75271	4/9/2018 0:45	6.52686
4/8/2018 13:00	11.34153	4/9/2018 1:00	6.853522
4/8/2018 13:15	11.31637	4/9/2018 1:15	7.03688
4/8/2018 13:30	10.00363	4/9/2018 1:30	7.03688
4/8/2018 13:45	8.247528	4/9/2018 1:45	7.194776
4/8/2018 14:00	8.247528	4/9/2018 2:00	6.560328
4/8/2018 14:15	7.427365	4/9/2018 2:15	4.147194
4/8/2018 14:30	7.379037	4/9/2018 2:30	4.069081
4/8/2018 14:45	7.299551	4/9/2018 2:45	5.834291
4/8/2018 15:00	9.544836	4/9/2018 3:00	6.20782
4/8/2018 15:15	7.215652	4/9/2018 3:15	6.20782
4/8/2018 15:30	9.488946	4/9/2018 3:30	5.991327
4/8/2018 15:45	9.646824	4/9/2018 3:45	5.991327
4/8/2018 16:00	11.15023	4/9/2018 4:00	5.904797
4/8/2018 16:15	11.50643	4/9/2018 4:15	6.024035
4/8/2018 16:30	11.6664	4/9/2018 4:30	6.024035
4/8/2018 16:45	11.797	4/9/2018 4:45	6.024035
4/8/2018 17:00	11.797	4/9/2018 5:00	5.71635
4/8/2018 17:15	12.22778	4/9/2018 5:15	5.812897
4/8/2018 17:30	11.62698	4/9/2018 5:30	5.597736
4/8/2018 17:45	10.80932	4/9/2018 5:45	5.48383
4/8/2018 18:00	10.80932	4/9/2018 6:00	3.738273
4/8/2018 18:15	11.53087	4/9/2018 6:15	3.469754
4/8/2018 18:30	11.53087	4/9/2018 6:30	3.385882
4/8/2018 18:45	10.46482	4/9/2018 6:45	3.300861
4/8/2018 19:00	9.507407	4/9/2018 7:00	3.508539
4/8/2018 19:15	8.574747	4/9/2018 7:15	3.508539
4/8/2018 19:30	8.574747	4/9/2018 7:30	3.508539
4/8/2018 19:45	8.574747	4/9/2018 7:45	3.749955
4/8/2018 20:00	8.819577	4/9/2018 8:00	3.995034
4/8/2018 20:15	8.883194	4/9/2018 8:15	4.106703
4/8/2018 20:30	9.686169	4/9/2018 8:30	6.202363
4/8/2018 20:45	9.54476	4/9/2018 8:45	6.202363
4/8/2018 21:00	8.644927	4/9/2018 9:00	6.202363
4/8/2018 21:15	8.407157	4/9/2018 9:15	5.814369
4/8/2018 21:30	8.145617	4/9/2018 9:30	4.080238
4/8/2018 21:45	7.973656	4/9/2018 9:45	3.745356
4/8/2018 22:00	7.420464	4/9/2018 10:00	3.819523
4/8/2018 22:15	7.339026	4/9/2018 10:15	4.022235
4/8/2018 22:30	7.420464	4/9/2018 10:30	3.958965
4/8/2018 22:45	7.339026	4/9/2018 10:45	4.022235
4/8/2018 23:00	7.428739	4/9/2018 11:00	4.19519
4/8/2018 23:15	7.428739	4/9/2018 11:15	4.19519
4/8/2018 23:30	7.428739	4/9/2018 11:30	3.98606
4/8/2018 23:45	7.020443	4/9/2018 11:45	3.745411
4/9/2018 0:00	6.778596	4/9/2018 12:00	3.681463
4/9/2018 0:15	6.778596	4/9/2018 12:15	3.681463
4/9/2018 0:30	6.765572	4/9/2018 12:30	3.73594

Site 12 – MH 7.05 Flow Meter Data

4/9/2018 12:45	3.890021	4/10/2018 0:45	3.550124
4/9/2018 13:00	3.894861	4/10/2018 1:00	3.481852
4/9/2018 13:15	5.136487	4/10/2018 1:15	3.481852
4/9/2018 13:30	5.136487	4/10/2018 1:30	3.481852
4/9/2018 13:45	4.131782	4/10/2018 1:45	3.417077
4/9/2018 14:00	3.703187	4/10/2018 2:00	3.340765
4/9/2018 14:15	3.703187	4/10/2018 2:15	3.332578
4/9/2018 14:30	3.703187	4/10/2018 2:30	3.271212
4/9/2018 14:45	3.703187	4/10/2018 2:45	3.354154
4/9/2018 15:00	3.903158	4/10/2018 3:00	3.400644
4/9/2018 15:15	3.943944	4/10/2018 3:15	3.400644
4/9/2018 15:30	4.053054	4/10/2018 3:30	3.354154
4/9/2018 15:45	4.021276	4/10/2018 3:45	3.427728
4/9/2018 16:00	4.053054	4/10/2018 4:00	3.287071
4/9/2018 16:15	4.175941	4/10/2018 4:15	3.287071
4/9/2018 16:30	4.229508	4/10/2018 4:30	3.287071
4/9/2018 16:45	4.229508	4/10/2018 4:45	3.357561
4/9/2018 17:00	4.214187	4/10/2018 5:00	3.357561
4/9/2018 17:15	4.214187	4/10/2018 5:15	3.65904
4/9/2018 17:30	4.23289	4/10/2018 5:30	3.742815
4/9/2018 17:45	4.324477	4/10/2018 5:45	3.742815
4/9/2018 18:00	4.39197	4/10/2018 6:00	4.020617
4/9/2018 18:15	4.407938	4/10/2018 6:15	3.742815
4/9/2018 18:30	4.471955	4/10/2018 6:30	3.469332
4/9/2018 18:45	4.471955	4/10/2018 6:45	3.469332
4/9/2018 19:00	4.097839	4/10/2018 7:00	3.460796
4/9/2018 19:15	4.097839	4/10/2018 7:15	3.460796
4/9/2018 19:30	4.306396	4/10/2018 7:30	4.753607
4/9/2018 19:45	4.082995	4/10/2018 7:45	4.753607
4/9/2018 20:00	3.872539	4/10/2018 8:00	8.09468
4/9/2018 20:15	3.588891	4/10/2018 8:15	8.219863
4/9/2018 20:30	3.588891	4/10/2018 8:30	8.216581
4/9/2018 20:45	3.615215	4/10/2018 8:45	5.780564
4/9/2018 21:00	3.39844	4/10/2018 9:00	5.780564
4/9/2018 21:15	3.615215	4/10/2018 9:15	5.7002
4/9/2018 21:30	3.120166	4/10/2018 9:30	4.590216
4/9/2018 21:45	3.120166	4/10/2018 9:45	3.709988
4/9/2018 22:00	3.120166	4/10/2018 10:00	3.387281
4/9/2018 22:15	3.315979	4/10/2018 10:15	3.479677
4/9/2018 22:30	3.24051	4/10/2018 10:30	3.133524
4/9/2018 22:45	3.37695	4/10/2018 10:45	3.604508
4/9/2018 23:00	3.37695	4/10/2018 11:00	3.604508
4/9/2018 23:15	2.820856	4/10/2018 11:15	4.649716
4/9/2018 23:30	2.954862	4/10/2018 11:30	4.365655
4/9/2018 23:45	3.044035	4/10/2018 11:45	4.704162
4/10/2018 0:00	3.397923	4/10/2018 12:00	3.708776
4/10/2018 0:15	3.47017	4/10/2018 12:15	3.697301
4/10/2018 0:30	3.542897	4/10/2018 12:30	3.776141

Site 12 – MH 7.05 Flow Meter Data

4/10/2018 12:45	3.658693	4/11/2018 0:45	3.550124
4/10/2018 13:00	3.507486	4/11/2018 1:00	3.579343
4/10/2018 13:15	3.507486	4/11/2018 1:15	3.477249
4/10/2018 13:30	3.658693	4/11/2018 1:30	4.016564
4/10/2018 13:45	4.247667	4/11/2018 1:45	3.607321
4/10/2018 14:00	4.247667	4/11/2018 2:00	3.607321
4/10/2018 14:15	4.247667	4/11/2018 2:15	3.682923
4/10/2018 14:30	3.816325	4/11/2018 2:30	3.682923
4/10/2018 14:45	3.577053	4/11/2018 2:45	3.558323
4/10/2018 15:00	3.577053	4/11/2018 3:00	3.615426
4/10/2018 15:15	3.566029	4/11/2018 3:15	3.448408
4/10/2018 15:30	3.573393	4/11/2018 3:30	3.448408
4/10/2018 15:45	3.498567	4/11/2018 3:45	3.506624
4/10/2018 16:00	3.498567	4/11/2018 4:00	3.485375
4/10/2018 16:15	3.513578	4/11/2018 4:15	3.534363
4/10/2018 16:30	3.520753	4/11/2018 4:30	3.633392
4/10/2018 16:45	3.520753	4/11/2018 4:45	3.633392
4/10/2018 17:00	3.5885	4/11/2018 5:00	3.633392
4/10/2018 17:15	3.5885	4/11/2018 5:15	3.633392
4/10/2018 17:30	3.791737	4/11/2018 5:30	3.619098
4/10/2018 17:45	3.95969	4/11/2018 5:45	3.619098
4/10/2018 18:00	3.95969	4/11/2018 6:00	3.685083
4/10/2018 18:15	3.95969	4/11/2018 6:15	3.593957
4/10/2018 18:30	3.238044	4/11/2018 6:30	3.698488
4/10/2018 18:45	3.238044	4/11/2018 6:45	3.897846
4/10/2018 19:00	3.238044	4/11/2018 7:00	3.81432
4/10/2018 19:15	3.354349	4/11/2018 7:15	4.182947
4/10/2018 19:30	3.354349	4/11/2018 7:30	4.182947
4/10/2018 19:45	3.393882	4/11/2018 7:45	4.093312
4/10/2018 20:00	3.44457	4/11/2018 8:00	3.435594
4/10/2018 20:15	2.329238	4/11/2018 8:15	3.435594
4/10/2018 20:30	2.308966	4/11/2018 8:30	3.435594
4/10/2018 20:45	3.243282	4/11/2018 8:45	3.839436
4/10/2018 21:00	3.325155	4/11/2018 9:00	5.079867
4/10/2018 21:15	3.262163	4/11/2018 9:15	5.915051
4/10/2018 21:30	3.325155	4/11/2018 9:30	4.543311
4/10/2018 21:45	3.441412	4/11/2018 9:45	4.626023
4/10/2018 22:00	3.257278	4/11/2018 10:00	4.765028
4/10/2018 22:15	3.462587	4/11/2018 10:15	4.857233
4/10/2018 22:30	3.463268	4/11/2018 10:30	4.681042
4/10/2018 22:45	3.463268	4/11/2018 10:45	4.857233
4/10/2018 23:00	3.536904	4/11/2018 11:00	4.681042
4/10/2018 23:15	3.463268	4/11/2018 11:15	4.130292
4/10/2018 23:30	2.10166	4/11/2018 11:30	3.400208
4/10/2018 23:45	2.10166	4/11/2018 11:45	4.09777
4/11/2018 0:00	3.766655	4/11/2018 12:00	4.09777
4/11/2018 0:15	3.481852	4/11/2018 12:15	4.284584
4/11/2018 0:30	3.686667	4/11/2018 12:30	4.575337

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4/11/2018 12:45	4.636921	4/12/2018 0:45	3.995042
4/11/2018 13:00	4.636921	4/12/2018 1:00	4.232313
4/11/2018 13:15	4.671783	4/12/2018 1:15	4.477454
4/11/2018 13:30	5.10336	4/12/2018 1:30	4.698005
4/11/2018 13:45	5.257989	4/12/2018 1:45	5.223066
4/11/2018 14:00	5.188805	4/12/2018 2:00	4.608606
4/11/2018 14:15	4.631538	4/12/2018 2:15	3.73409
4/11/2018 14:30	4.75838	4/12/2018 2:30	3.730101
4/11/2018 14:45	4.75838	4/12/2018 2:45	3.730101
4/11/2018 15:00	4.462877	4/12/2018 3:00	3.819829
4/11/2018 15:15	4.004969	4/12/2018 3:15	3.772506
4/11/2018 15:30	5.23607	4/12/2018 3:30	3.195134
4/11/2018 15:45	5.050478	4/12/2018 3:45	3.195134
4/11/2018 16:00	5.49873	4/12/2018 4:00	3.583892
4/11/2018 16:15	3.789345	4/12/2018 4:15	2.774411
4/11/2018 16:30	5.243032	4/12/2018 4:30	3.333288
4/11/2018 16:45	3.954448	4/12/2018 4:45	4.265265
4/11/2018 17:00	5.134478	4/12/2018 5:00	3.515905
4/11/2018 17:15	3.887296	4/12/2018 5:15	4.099925
4/11/2018 17:30	3.887296	4/12/2018 5:30	4.694463
4/11/2018 17:45	3.562653	4/12/2018 5:45	4.37774
4/11/2018 18:00	3.624196	4/12/2018 6:00	4.37774
4/11/2018 18:15	3.624196	4/12/2018 6:15	4.489802
4/11/2018 18:30	4.110372	4/12/2018 6:30	4.514409
4/11/2018 18:45	4.274067	4/12/2018 6:45	4.612616
4/11/2018 19:00	4.274067	4/12/2018 7:00	4.612616
4/11/2018 19:15	4.061702	4/12/2018 7:15	3.970047
4/11/2018 19:30	3.776183	4/12/2018 7:30	4.059387
4/11/2018 19:45	3.776183	4/12/2018 7:45	3.594574
4/11/2018 20:00	3.776183	4/12/2018 8:00	3.511735
4/11/2018 20:15	4.588387	4/12/2018 8:15	3.632086
4/11/2018 20:30	3.626029	4/12/2018 8:30	3.632086
4/11/2018 20:45	3.626029	4/12/2018 8:45	3.312791
4/11/2018 21:00	3.626029	4/12/2018 9:00	3.451294
4/11/2018 21:15	3.893447	4/12/2018 9:15	3.291578
4/11/2018 21:30	3.743862	4/12/2018 9:30	2.983378
4/11/2018 21:45	3.740671	4/12/2018 9:45	2.905978
4/11/2018 22:00	3.64448	4/12/2018 10:00	2.885772
4/11/2018 22:15	3.732724	4/12/2018 10:15	2.72112
4/11/2018 22:30	3.65224	4/12/2018 10:30	2.790427
4/11/2018 22:45	3.658319	4/12/2018 10:45	3.089858
4/11/2018 23:00	3.658319	4/12/2018 11:00	3.475474
4/11/2018 23:15	3.735857	4/12/2018 11:15	3.661471
4/11/2018 23:30	3.587345	4/12/2018 11:30	3.661471
4/11/2018 23:45	3.473008	4/12/2018 11:45	3.624033
4/12/2018 0:00	3.473008	4/12/2018 12:00	3.624033
4/12/2018 0:15	3.646394	4/12/2018 12:15	2.596069
4/12/2018 0:30	3.926142	4/12/2018 12:30	2.604312

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4/12/2018 12:45	2.941401	4/13/2018 0:45	3.384182
4/12/2018 13:00	3.388623	4/13/2018 1:00	3.384182
4/12/2018 13:15	3.57491	4/13/2018 1:15	3.384182
4/12/2018 13:30	3.57491	4/13/2018 1:30	3.384182
4/12/2018 13:45	3.90662	4/13/2018 1:45	3.009602
4/12/2018 14:00	3.764303	4/13/2018 2:00	2.909853
4/12/2018 14:15	3.039421	4/13/2018 2:15	2.981723
4/12/2018 14:30	2.493939	4/13/2018 2:30	2.981723
4/12/2018 14:45	2.911638	4/13/2018 2:45	2.981723
4/12/2018 15:00	2.911638	4/13/2018 3:00	2.840551
4/12/2018 15:15	2.911638	4/13/2018 3:15	2.840551
4/12/2018 15:30	2.983552	4/13/2018 3:30	2.840551
4/12/2018 15:45	3.4889	4/13/2018 3:45	2.786956
4/12/2018 16:00	3.290047	4/13/2018 4:00	2.786956
4/12/2018 16:15	3.290047	4/13/2018 4:15	2.73336
4/12/2018 16:30	2.680958	4/13/2018 4:30	2.73336
4/12/2018 16:45	2.615028	4/13/2018 4:45	3.041676
4/12/2018 17:00	2.977353	4/13/2018 5:00	3.38359
4/12/2018 17:15	3.052417	4/13/2018 5:15	3.304208
4/12/2018 17:30	3.754058	4/13/2018 5:30	3.456728
4/12/2018 17:45	3.778777	4/13/2018 5:45	3.304208
4/12/2018 18:00	3.72555	4/13/2018 6:00	3.253038
4/12/2018 18:15	3.72555	4/13/2018 6:15	3.108898
4/12/2018 18:30	3.566885	4/13/2018 6:30	3.108898
4/12/2018 18:45	3.617845	4/13/2018 6:45	3.108898
4/12/2018 19:00	4.655005	4/13/2018 7:00	3.658693
4/12/2018 19:15	6.522974	4/13/2018 7:15	3.658693
4/12/2018 19:30	4.655005	4/13/2018 7:30	4.125152
4/12/2018 19:45	5.066948	4/13/2018 7:45	5.344116
4/12/2018 20:00	3.621784	4/13/2018 8:00	5.409839
4/12/2018 20:15	3.606616	4/13/2018 8:15	4.646287
4/12/2018 20:30	3.270846	4/13/2018 8:30	4.646287
4/12/2018 20:45	3.527945	4/13/2018 8:45	4.468326
4/12/2018 21:00	3.27773	4/13/2018 9:00	4.468326
4/12/2018 21:15	3.27773	4/13/2018 9:15	4.468326
4/12/2018 21:30	3.299367	4/13/2018 9:30	4.137857
4/12/2018 21:45	3.707268	4/13/2018 9:45	4.137857
4/12/2018 22:00	3.740976	4/13/2018 10:00	4.241243
4/12/2018 22:15	3.740976	4/13/2018 10:15	4.117018
4/12/2018 22:30	3.744812	4/13/2018 10:30	3.653056
4/12/2018 22:45	3.830238	4/13/2018 10:45	3.53959
4/12/2018 23:00	3.572843	4/13/2018 11:00	3.241198
4/12/2018 23:15	3.53775	4/13/2018 11:15	3.53959
4/12/2018 23:30	3.015799	4/13/2018 11:30	3.59153
4/12/2018 23:45	3.015799	4/13/2018 11:45	3.864094
4/13/2018 0:00	3.015799	4/13/2018 12:00	4.753515
4/13/2018 0:15	3.015799	4/13/2018 12:15	6.003289
4/13/2018 0:30	3.35721	4/13/2018 12:30	5.871242

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4/13/2018 12:45	5.744298	4/14/2018 0:45	5.605952
4/13/2018 13:00	6.232375	4/14/2018 1:00	5.605952
4/13/2018 13:15	5.6238	4/14/2018 1:15	4.654834
4/13/2018 13:30	6.42581	4/14/2018 1:30	4.925951
4/13/2018 13:45	6.468268	4/14/2018 1:45	5.156671
4/13/2018 14:00	6.669422	4/14/2018 2:00	4.889758
4/13/2018 14:15	6.675952	4/14/2018 2:15	4.686857
4/13/2018 14:30	4.273635	4/14/2018 2:30	4.767673
4/13/2018 14:45	7.845351	4/14/2018 2:45	5.220076
4/13/2018 15:00	6.912671	4/14/2018 3:00	5.322293
4/13/2018 15:15	6.912671	4/14/2018 3:15	5.135508
4/13/2018 15:30	8.905084	4/14/2018 3:30	5.408737
4/13/2018 15:45	8.905084	4/14/2018 3:45	5.52001
4/13/2018 16:00	8.905084	4/14/2018 4:00	5.615218
4/13/2018 16:15	6.915192	4/14/2018 4:15	6.088149
4/13/2018 16:30	6.915192	4/14/2018 4:30	5.797725
4/13/2018 16:45	8.900038	4/14/2018 4:45	5.797725
4/13/2018 17:00	8.363959	4/14/2018 5:00	5.457772
4/13/2018 17:15	8.037561	4/14/2018 5:15	5.731167
4/13/2018 17:30	8.113772	4/14/2018 5:30	5.609424
4/13/2018 17:45	8.363959	4/14/2018 5:45	5.731167
4/13/2018 18:00	6.505312	4/14/2018 6:00	5.731167
4/13/2018 18:15	9.408294	4/14/2018 6:15	5.650889
4/13/2018 18:30	8.81137	4/14/2018 6:30	5.375294
4/13/2018 18:45	9.702373	4/14/2018 6:45	5.876762
4/13/2018 19:00	10.12935	4/14/2018 7:00	6.329863
4/13/2018 19:15	9.281063	4/14/2018 7:15	6.347851
4/13/2018 19:30	8.779956	4/14/2018 7:30	6.417054
4/13/2018 19:45	10.09638	4/14/2018 7:45	7.862984
4/13/2018 20:00	8.498508	4/14/2018 8:00	7.862984
4/13/2018 20:15	8.196179	4/14/2018 8:15	6.346842
4/13/2018 20:30	7.538335	4/14/2018 8:30	5.322325
4/13/2018 20:45	6.652582	4/14/2018 8:45	5.132679
4/13/2018 21:00	5.71276	4/14/2018 9:00	5.132679
4/13/2018 21:15	5.505255	4/14/2018 9:15	5.122942
4/13/2018 21:30	5.505255	4/14/2018 9:30	5.825318
4/13/2018 21:45	5.093704	4/14/2018 9:45	5.363085
4/13/2018 22:00	7.558358	4/14/2018 10:00	5.363085
4/13/2018 22:15	7.558358	4/14/2018 10:15	5.11164
4/13/2018 22:30	5.005603	4/14/2018 10:30	6.764159
4/13/2018 22:45	5.756579	4/14/2018 10:45	5.484615
4/13/2018 23:00	6.654852	4/14/2018 11:00	6.764159
4/13/2018 23:15	6.515176	4/14/2018 11:15	6.208672
4/13/2018 23:30	6.825144	4/14/2018 11:30	6.226297
4/13/2018 23:45	6.839572	4/14/2018 11:45	5.533397
4/14/2018 0:00	7.196984	4/14/2018 12:00	5.533397
4/14/2018 0:15	6.445722	4/14/2018 12:15	5.280427
4/14/2018 0:30	6.343606	4/14/2018 12:30	5.057002

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4/14/2018 12:45	4.79264	4/15/2018 0:45	3.69927
4/14/2018 13:00	5.285557	4/15/2018 1:00	3.669266
4/14/2018 13:15	5.503417	4/15/2018 1:15	3.583651
4/14/2018 13:30	5.362998	4/15/2018 1:30	3.495635
4/14/2018 13:45	5.13487	4/15/2018 1:45	3.30838
4/14/2018 14:00	4.41762	4/15/2018 2:00	3.30838
4/14/2018 14:15	4.05802	4/15/2018 2:15	3.322096
4/14/2018 14:30	4.008932	4/15/2018 2:30	3.322096
4/14/2018 14:45	3.915953	4/15/2018 2:45	3.333233
4/14/2018 15:00	4.008932	4/15/2018 3:00	3.39859
4/14/2018 15:15	4.088401	4/15/2018 3:15	3.412416
4/14/2018 15:30	4.394086	4/15/2018 3:30	3.412416
4/14/2018 15:45	4.475447	4/15/2018 3:45	3.412416
4/14/2018 16:00	4.46636	4/15/2018 4:00	3.412416
4/14/2018 16:15	4.115699	4/15/2018 4:15	3.543663
4/14/2018 16:30	4.46636	4/15/2018 4:30	3.547281
4/14/2018 16:45	3.929691	4/15/2018 4:45	3.519068
4/14/2018 17:00	3.929691	4/15/2018 5:00	3.609367
4/14/2018 17:15	3.943491	4/15/2018 5:15	3.671868
4/14/2018 17:30	4.209011	4/15/2018 5:30	3.671868
4/14/2018 17:45	3.943491	4/15/2018 5:45	3.667361
4/14/2018 18:00	4.140455	4/15/2018 6:00	3.667361
4/14/2018 18:15	4.151044	4/15/2018 6:15	3.667361
4/14/2018 18:30	4.211661	4/15/2018 6:30	3.667361
4/14/2018 18:45	4.211661	4/15/2018 6:45	3.667361
4/14/2018 19:00	4.368144	4/15/2018 7:00	3.763968
4/14/2018 19:15	4.918913	4/15/2018 7:15	3.806156
4/14/2018 19:30	5.101117	4/15/2018 7:30	3.73401
4/14/2018 19:45	4.724452	4/15/2018 7:45	6.1615
4/14/2018 20:00	4.714581	4/15/2018 8:00	6.401804
4/14/2018 20:15	5.327751	4/15/2018 8:15	5.014288
4/14/2018 20:30	6.925478	4/15/2018 8:30	3.532528
4/14/2018 20:45	8.005039	4/15/2018 8:45	3.46324
4/14/2018 21:00	8.493682	4/15/2018 9:00	3.46324
4/14/2018 21:15	8.656005	4/15/2018 9:15	4.081518
4/14/2018 21:30	8.418437	4/15/2018 9:30	3.160096
4/14/2018 21:45	8.418437	4/15/2018 9:45	2.873841
4/14/2018 22:00	3.573701	4/15/2018 10:00	3.194171
4/14/2018 22:15	3.573701	4/15/2018 10:15	3.352045
4/14/2018 22:30	3.326401	4/15/2018 10:30	3.153544
4/14/2018 22:45	3.186976	4/15/2018 10:45	3.266572
4/14/2018 23:00	3.17345	4/15/2018 11:00	3.431891
4/14/2018 23:15	3.121521	4/15/2018 11:15	3.266572
4/14/2018 23:30	3.082848	4/15/2018 11:30	3.266572
4/14/2018 23:45	3.121521	4/15/2018 11:45	3.754885
4/15/2018 0:00	3.131725	4/15/2018 12:00	3.754885
4/15/2018 0:15	3.131725	4/15/2018 12:15	3.34667
4/15/2018 0:30	3.208817	4/15/2018 12:30	3.34667

Site 12 – MH 7.05 Flow Meter Data

4/15/2018 12:45	3.286966	4/16/2018 0:45	3.520103
4/15/2018 13:00	3.286966	4/16/2018 1:00	3.338981
4/15/2018 13:15	3.498818	4/16/2018 1:15	2.83109
4/15/2018 13:30	3.532525	4/16/2018 1:30	2.554606
4/15/2018 13:45	3.532525	4/16/2018 1:45	2.377598
4/15/2018 14:00	3.546879	4/16/2018 2:00	2.377598
4/15/2018 14:15	3.546879	4/16/2018 2:15	2.570852
4/15/2018 14:30	3.342788	4/16/2018 2:30	2.753682
4/15/2018 14:45	3.256682	4/16/2018 2:45	2.836032
4/15/2018 15:00	3.663689	4/16/2018 3:00	2.836032
4/15/2018 15:15	3.260681	4/16/2018 3:15	3.112878
4/15/2018 15:30	3.309282	4/16/2018 3:30	3.383734
4/15/2018 15:45	3.309282	4/16/2018 3:45	3.383734
4/15/2018 16:00	3.145015	4/16/2018 4:00	3.307675
4/15/2018 16:15	3.076116	4/16/2018 4:15	4.100376
4/15/2018 16:30	3.076116	4/16/2018 4:30	4.100376
4/15/2018 16:45	3.072904	4/16/2018 4:45	4.32445
4/15/2018 17:00	3.076116	4/16/2018 5:00	4.193225
4/15/2018 17:15	3.433028	4/16/2018 5:15	4.55277
4/15/2018 17:30	3.484772	4/16/2018 5:30	4.218454
4/15/2018 17:45	3.422033	4/16/2018 5:45	4.98088
4/15/2018 18:00	3.876597	4/16/2018 6:00	4.753188
4/15/2018 18:15	3.529512	4/16/2018 6:15	4.567936
4/15/2018 18:30	3.529512	4/16/2018 6:30	4.430655
4/15/2018 18:45	3.334178	4/16/2018 6:45	4.430655
4/15/2018 19:00	3.291757	4/16/2018 7:00	4.113158
4/15/2018 19:15	2.670117	4/16/2018 7:15	3.613313
4/15/2018 19:30	2.638067	4/16/2018 7:30	3.613313
4/15/2018 19:45	2.638067	4/16/2018 7:45	3.383958
4/15/2018 20:00	2.889437	4/16/2018 8:00	3.26246
4/15/2018 20:15	3.465076	4/16/2018 8:15	3.483579
4/15/2018 20:30	3.465076	4/16/2018 8:30	4.274585
4/15/2018 20:45	3.061798	4/16/2018 8:45	3.430618
4/15/2018 21:00	3.501164	4/16/2018 9:00	3.612562
4/15/2018 21:15	3.093685	4/16/2018 9:15	4.112306
4/15/2018 21:30	3.040644	4/16/2018 9:30	4.077297
4/15/2018 21:45	3.087039	4/16/2018 9:45	4.077297
4/15/2018 22:00	3.087039	4/16/2018 10:00	4.128971
4/15/2018 22:15	2.962466	4/16/2018 10:15	4.167637
4/15/2018 22:30	3.088433	4/16/2018 10:30	4.221571
4/15/2018 22:45	3.290232	4/16/2018 10:45	3.529431
4/15/2018 23:00	3.260826	4/16/2018 11:00	3.319703
4/15/2018 23:15	3.557425	4/16/2018 11:15	3.142089
4/15/2018 23:30	3.557425	4/16/2018 11:30	0.637083
4/15/2018 23:45	3.557425	4/16/2018 11:45	0.528395
4/16/2018 0:00	3.557425	4/16/2018 12:00	0.510516
4/16/2018 0:15	3.57435	4/16/2018 12:15	0.548338
4/16/2018 0:30	3.58235	4/16/2018 12:30	0.640092

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4/16/2018 12:45	3.001221	4/17/2018 0:45	3.315082
4/16/2018 13:00	3.198736	4/17/2018 1:00	3.315082
4/16/2018 13:15	3.360098	4/17/2018 1:15	3.315082
4/16/2018 13:30	3.375807	4/17/2018 1:30	3.315082
4/16/2018 13:45	3.53807	4/17/2018 1:45	3.146758
4/16/2018 14:00	3.854324	4/17/2018 2:00	3.223209
4/16/2018 14:15	3.845145	4/17/2018 2:15	3.08937
4/16/2018 14:30	3.486863	4/17/2018 2:30	3.016094
4/16/2018 14:45	4.571697	4/17/2018 2:45	3.030195
4/16/2018 15:00	4.571697	4/17/2018 3:00	2.87598
4/16/2018 15:15	4.138579	4/17/2018 3:15	2.87598
4/16/2018 15:30	4.60506	4/17/2018 3:30	3.006349
4/16/2018 15:45	5.39679	4/17/2018 3:45	3.006349
4/16/2018 16:00	7.039737	4/17/2018 4:00	3.145563
4/16/2018 16:15	8.175041	4/17/2018 4:15	3.236676
4/16/2018 16:30	7.837802	4/17/2018 4:30	3.236676
4/16/2018 16:45	6.212582	4/17/2018 4:45	3.266986
4/16/2018 17:00	5.460227	4/17/2018 5:00	3.266986
4/16/2018 17:15	5.178642	4/17/2018 5:15	3.276426
4/16/2018 17:30	5.131426	4/17/2018 5:30	2.92616
4/16/2018 17:45	4.917106	4/17/2018 5:45	3.287607
4/16/2018 18:00	4.917106	4/17/2018 6:00	3.313918
4/16/2018 18:15	5.048152	4/17/2018 6:15	2.763621
4/16/2018 18:30	5.170012	4/17/2018 6:30	3.510196
4/16/2018 18:45	5.150507	4/17/2018 6:45	3.724382
4/16/2018 19:00	4.753617	4/17/2018 7:00	3.300592
4/16/2018 19:15	5.211142	4/17/2018 7:15	3.297093
4/16/2018 19:30	4.336003	4/17/2018 7:30	3.025543
4/16/2018 19:45	4.067223	4/17/2018 7:45	3.297093
4/16/2018 20:00	3.884295	4/17/2018 8:00	2.824079
4/16/2018 20:15	5.045807	4/17/2018 8:15	2.508022
4/16/2018 20:30	5.045807	4/17/2018 8:30	3.320803
4/16/2018 20:45	4.073137	4/17/2018 8:45	3.712017
4/16/2018 21:00	5.405219	4/17/2018 9:00	3.77761
4/16/2018 21:15	5.482632	4/17/2018 9:15	3.77761
4/16/2018 21:30	5.070507	4/17/2018 9:30	4.157868
4/16/2018 21:45	4.802598	4/17/2018 9:45	4.476799
4/16/2018 22:00	4.802598	4/17/2018 10:00	4.476799
4/16/2018 22:15	3.802725	4/17/2018 10:15	4.753288
4/16/2018 22:30	3.350061	4/17/2018 10:30	4.753288
4/16/2018 22:45	3.25362	4/17/2018 10:45	4.234598
4/16/2018 23:00	3.00214	4/17/2018 11:00	3.885315
4/16/2018 23:15	2.78384	4/17/2018 11:15	4.076003
4/16/2018 23:30	2.645158	4/17/2018 11:30	4.076003
4/16/2018 23:45	2.78384	4/17/2018 11:45	4.073774
4/17/2018 0:00	3.025182	4/17/2018 12:00	4.085109
4/17/2018 0:15	3.025182	4/17/2018 12:15	4.170054
4/17/2018 0:30	2.923673	4/17/2018 12:30	4.063922

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4/17/2018 12:45	3.767267	4/18/2018 0:45	2.925789
4/17/2018 13:00	4.200252	4/18/2018 1:00	2.714155
4/17/2018 13:15	4.584221	4/18/2018 1:15	2.047221
4/17/2018 13:30	4.018034	4/18/2018 1:30	2.047221
4/17/2018 13:45	4.092876	4/18/2018 1:45	2.088541
4/17/2018 14:00	4.092876	4/18/2018 2:00	2.100554
4/17/2018 14:15	4.119934	4/18/2018 2:15	4.272096
4/17/2018 14:30	3.554427	4/18/2018 2:30	4.272096
4/17/2018 14:45	2.749904	4/18/2018 2:45	4.358321
4/17/2018 15:00	2.788432	4/18/2018 3:00	4.272096
4/17/2018 15:15	2.749904	4/18/2018 3:15	3.946783
4/17/2018 15:30	3.622173	4/18/2018 3:30	3.072155
4/17/2018 15:45	3.622173	4/18/2018 3:45	2.986191
4/17/2018 16:00	2.319787	4/18/2018 4:00	2.03957
4/17/2018 16:15	1.464204	4/18/2018 4:15	2.03957
4/17/2018 16:30	0.444771	4/18/2018 4:30	2.03957
4/17/2018 16:45	0.444771	4/18/2018 4:45	0
4/17/2018 17:00	0	4/18/2018 5:00	153.7059
4/17/2018 17:15	0.28325	4/18/2018 5:15	3.867379
4/17/2018 17:30	0.383256	4/18/2018 5:30	75.75835
4/17/2018 17:45	0.941095	4/18/2018 5:45	2.587647
4/17/2018 18:00	1.572594	4/18/2018 6:00	2.822052
4/17/2018 18:15	2.551737	4/18/2018 6:15	2.822052
4/17/2018 18:30	3.558086	4/18/2018 6:30	2.273458
4/17/2018 18:45	4.654549	4/18/2018 6:45	2.878958
4/17/2018 19:00	4.205184	4/18/2018 7:00	2.631854
4/17/2018 19:15	4.266931	4/18/2018 7:15	2.481075
4/17/2018 19:30	4.83919	4/18/2018 7:30	2.475358
4/17/2018 19:45	3.090852	4/18/2018 7:45	2.475358
4/17/2018 20:00	3.052812	4/18/2018 8:00	2.63763
4/17/2018 20:15	3.226549	4/18/2018 8:15	2.544334
4/17/2018 20:30	3.165699	4/18/2018 8:30	2.544334
4/17/2018 20:45	4.68966	4/18/2018 8:45	2.63763
4/17/2018 21:00	4.68966	4/18/2018 9:00	2.956782
4/17/2018 21:15	4.577334	4/18/2018 9:15	2.956782
4/17/2018 21:30	4.101699	4/18/2018 9:30	2.956782
4/17/2018 21:45	3.344691	4/18/2018 9:45	2.862664
4/17/2018 22:00	3.084778	4/18/2018 10:00	2.567093
4/17/2018 22:15	3.100425	4/18/2018 10:15	2.461711
4/17/2018 22:30	3.100425	4/18/2018 10:30	2.69644
4/17/2018 22:45	3.898582	4/18/2018 10:45	2.795331
4/17/2018 23:00	3.932406	4/18/2018 11:00	2.829776
4/17/2018 23:15	3.932406	4/18/2018 11:15	2.829776
4/17/2018 23:30	3.932406	4/18/2018 11:30	2.772315
4/17/2018 23:45	3.850257	4/18/2018 11:45	2.772315
4/18/2018 0:00	3.850257	4/18/2018 12:00	3.457493
4/18/2018 0:15	3.850257	4/18/2018 12:15	2.214256
4/18/2018 0:30	3.850257	4/18/2018 12:30	0

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4/18/2018 12:45	0.990363	4/19/2018 0:45	3.216178
4/18/2018 13:00	1.980726	4/19/2018 1:00	3.839635
4/18/2018 13:15	1.907887	4/19/2018 1:15	10.4203
4/18/2018 13:30	3.259449	4/19/2018 1:30	10.4203
4/18/2018 13:45	3.499917	4/19/2018 1:45	10.11392
4/18/2018 14:00	3.869362	4/19/2018 2:00	3.939088
4/18/2018 14:15	3.499917	4/19/2018 2:15	3.339535
4/18/2018 14:30	3.278702	4/19/2018 2:30	2.784444
4/18/2018 14:45	2.908075	4/19/2018 2:45	2.535982
4/18/2018 15:00	2.866608	4/19/2018 3:00	2.535982
4/18/2018 15:15	2.789834	4/19/2018 3:15	0
4/18/2018 15:30	3.267841	4/19/2018 3:30	0
4/18/2018 15:45	3.451441	4/19/2018 3:45	1.494507
4/18/2018 16:00	2.569504	4/19/2018 4:00	2.279212
4/18/2018 16:15	2.119589	4/19/2018 4:15	2.399695
4/18/2018 16:30	2.569504	4/19/2018 4:30	2.977798
4/18/2018 16:45	2.404114	4/19/2018 4:45	3.038569
4/18/2018 17:00	3.125157	4/19/2018 5:00	2.971287
4/18/2018 17:15	3.387205	4/19/2018 5:15	0.512092
4/18/2018 17:30	3.387205	4/19/2018 5:30	0.650396
4/18/2018 17:45	3.387205	4/19/2018 5:45	0.650396
4/18/2018 18:00	2.975294	4/19/2018 6:00	3.354931
4/18/2018 18:15	3.168572	4/19/2018 6:15	3.664514
4/18/2018 18:30	4.13754	4/19/2018 6:30	4.05946
4/18/2018 18:45	5.658153	4/19/2018 6:45	4.05946
4/18/2018 19:00	4.348164	4/19/2018 7:00	4.330516
4/18/2018 19:15	5.191051	4/19/2018 7:15	4.330516
4/18/2018 19:30	5.472585	4/19/2018 7:30	4.330516
4/18/2018 19:45	5.383217	4/19/2018 7:45	4.150779
4/18/2018 20:00	5.194819	4/19/2018 8:00	3.675549
4/18/2018 20:15	5.689703	4/19/2018 8:15	3.36156
4/18/2018 20:30	5.689703	4/19/2018 8:30	1.80824
4/18/2018 20:45	4.786233	4/19/2018 8:45	2.132569
4/18/2018 21:00	5.029592	4/19/2018 9:00	0
4/18/2018 21:15	5.336143	4/19/2018 9:15	5.186588
4/18/2018 21:30	4.588806	4/19/2018 9:30	0
4/18/2018 21:45	3.989224	4/19/2018 9:45	4.37825
4/18/2018 22:00	3.928516	4/19/2018 10:00	7.137317
4/18/2018 22:15	2.637559	4/19/2018 10:15	0
4/18/2018 22:30	2.082909	4/19/2018 10:30	40.95517
4/18/2018 22:45	1.714359	4/19/2018 10:45	8.704331
4/18/2018 23:00	1.607235	4/19/2018 11:00	40.89404
4/18/2018 23:15	1.690178	4/19/2018 11:15	0
4/18/2018 23:30	1.729993	4/19/2018 11:30	2.312496
4/18/2018 23:45	2.21723	4/19/2018 11:45	3.105298
4/19/2018 0:00	2.982926	4/19/2018 12:00	2.591689
4/19/2018 0:15	3.143435	4/19/2018 12:15	2.652184
4/19/2018 0:30	2.996934	4/19/2018 12:30	3.213672

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4/19/2018 12:45	2.720474	4/20/2018 0:45	2.671975
4/19/2018 13:00	3.102308	4/20/2018 1:00	0
4/19/2018 13:15	3.463997	4/20/2018 1:15	0
4/19/2018 13:30	4.739349	4/20/2018 1:30	0
4/19/2018 13:45	4.739349	4/20/2018 1:45	1.721235
4/19/2018 14:00	4.739349	4/20/2018 2:00	2.169287
4/19/2018 14:15	4.488303	4/20/2018 2:15	1.849075
4/19/2018 14:30	3.301174	4/20/2018 2:30	1.916879
4/19/2018 14:45	2.451655	4/20/2018 2:45	1.615931
4/19/2018 15:00	2.451655	4/20/2018 3:00	1.443052
4/19/2018 15:15	2.686343	4/20/2018 3:15	1.337231
4/19/2018 15:30	2.686343	4/20/2018 3:30	1.336842
4/19/2018 15:45	2.686343	4/20/2018 3:45	0
4/19/2018 16:00	2.779072	4/20/2018 4:00	1.521894
4/19/2018 16:15	3.079334	4/20/2018 4:15	0.227442
4/19/2018 16:30	3.725626	4/20/2018 4:30	1.973831
4/19/2018 16:45	3.725626	4/20/2018 4:45	1.645759
4/19/2018 17:00	3.357042	4/20/2018 5:00	2.575738
4/19/2018 17:15	3.076922	4/20/2018 5:15	1.56339
4/19/2018 17:30	3.956829	4/20/2018 5:30	1.645759
4/19/2018 17:45	3.544502	4/20/2018 5:45	1.443598
4/19/2018 18:00	3.544502	4/20/2018 6:00	1.443598
4/19/2018 18:15	3.956829	4/20/2018 6:15	1.249057
4/19/2018 18:30	4.485932	4/20/2018 6:30	2.112342
4/19/2018 18:45	4.485932	4/20/2018 6:45	2.348494
4/19/2018 19:00	4.507547	4/20/2018 7:00	2.524165
4/19/2018 19:15	4.71148	4/20/2018 7:15	2.577703
4/19/2018 19:30	0	4/20/2018 7:30	2.500049
4/19/2018 19:45	2.659446	4/20/2018 7:45	2.931583
4/19/2018 20:00	2.714092	4/20/2018 8:00	2.931583
4/19/2018 20:15	2.088371	4/20/2018 8:15	2.931583
4/19/2018 20:30	1.734678	4/20/2018 8:30	3.007417
4/19/2018 20:45	1.734678	4/20/2018 8:45	3.403423
4/19/2018 21:00	1.734678	4/20/2018 9:00	3.314826
4/19/2018 21:15	2.275401	4/20/2018 9:15	3.314826
4/19/2018 21:30	1.683998	4/20/2018 9:30	1.912389
4/19/2018 21:45	2.342681	4/20/2018 9:45	2.164206
4/19/2018 22:00	2.342681	4/20/2018 10:00	1.944308
4/19/2018 22:15	1.999711	4/20/2018 10:15	1.944308
4/19/2018 22:30	1.6598	4/20/2018 10:30	2.161197
4/19/2018 22:45	1.6598	4/20/2018 10:45	2.435992
4/19/2018 23:00	1.6598	4/20/2018 11:00	2.747401
4/19/2018 23:15	1.492362	4/20/2018 11:15	2.891198
4/19/2018 23:30	1.67607	4/20/2018 11:30	3.059349
4/19/2018 23:45	1.854259	4/20/2018 11:45	3.059349
4/20/2018 0:00	2.510982	4/20/2018 12:00	3.679196
4/20/2018 0:15	2.649292	4/20/2018 12:15	2.952527
4/20/2018 0:30	2.671975	4/20/2018 12:30	2.952527

Site 12 – MH 7.05 Flow Meter Data

4/20/2018 12:45	2.922274	4/21/2018 0:45	2.966815
4/20/2018 13:00	6.428684	4/21/2018 1:00	3.511551
4/20/2018 13:15	3.253837	4/21/2018 1:15	3.39939
4/20/2018 13:30	3.091104	4/21/2018 1:30	3.39939
4/20/2018 13:45	4.948123	4/21/2018 1:45	3.52795
4/20/2018 14:00	3.400163	4/21/2018 2:00	3.629904
4/20/2018 14:15	3.400163	4/21/2018 2:15	3.483096
4/20/2018 14:30	4.152718	4/21/2018 2:30	3.628021
4/20/2018 14:45	4.249975	4/21/2018 2:45	2.818466
4/20/2018 15:00	4.246617	4/21/2018 3:00	1.93666
4/20/2018 15:15	4.225676	4/21/2018 3:15	1.868559
4/20/2018 15:30	4.334506	4/21/2018 3:30	2.719357
4/20/2018 15:45	3.246677	4/21/2018 3:45	2.408736
4/20/2018 16:00	3.097341	4/21/2018 4:00	2.796414
4/20/2018 16:15	3.246677	4/21/2018 4:15	2.796414
4/20/2018 16:30	4.540318	4/21/2018 4:30	3.042905
4/20/2018 16:45	4.426321	4/21/2018 4:45	3.528489
4/20/2018 17:00	4.677506	4/21/2018 5:00	3.528489
4/20/2018 17:15	5.083386	4/21/2018 5:15	3.439345
4/20/2018 17:30	4.219796	4/21/2018 5:30	3.426417
4/20/2018 17:45	3.196256	4/21/2018 5:45	3.426417
4/20/2018 18:00	2.923045	4/21/2018 6:00	3.439345
4/20/2018 18:15	2.758496	4/21/2018 6:15	3.439345
4/20/2018 18:30	2.758496	4/21/2018 6:30	3.047517
4/20/2018 18:45	2.49866	4/21/2018 6:45	3.092521
4/20/2018 19:00	2.243585	4/21/2018 7:00	2.940003
4/20/2018 19:15	2.188624	4/21/2018 7:15	2.940003
4/20/2018 19:30	2.403842	4/21/2018 7:30	3.292214
4/20/2018 19:45	2.805585	4/21/2018 7:45	3.292214
4/20/2018 20:00	0	4/21/2018 8:00	3.524447
4/20/2018 20:15	1.622016	4/21/2018 8:15	3.624188
4/20/2018 20:30	3.244032	4/21/2018 8:30	2.678007
4/20/2018 20:45	2.133477	4/21/2018 8:45	1.37566
4/20/2018 21:00	2.601023	4/21/2018 9:00	1.925906
4/20/2018 21:15	3.394157	4/21/2018 9:15	1.912881
4/20/2018 21:30	3.00827	4/21/2018 9:30	2.489298
4/20/2018 21:45	2.325933	4/21/2018 9:45	3.291148
4/20/2018 22:00	3.12657	4/21/2018 10:00	3.853164
4/20/2018 22:15	3.456075	4/21/2018 10:15	3.942671
4/20/2018 22:30	3.543369	4/21/2018 10:30	3.942671
4/20/2018 22:45	3.543369	4/21/2018 10:45	3.646415
4/20/2018 23:00	2.683243	4/21/2018 11:00	3.646415
4/20/2018 23:15	3.007576	4/21/2018 11:15	2.78925
4/20/2018 23:30	2.737103	4/21/2018 11:30	2.78925
4/20/2018 23:45	2.458936	4/21/2018 11:45	3.189878
4/21/2018 0:00	3.690068	4/21/2018 12:00	3.912961
4/21/2018 0:15	3.997416	4/21/2018 12:15	4.37018
4/21/2018 0:30	3.252398	4/21/2018 12:30	4.37018

Site 12 – MH 7.05 Flow Meter Data

4/21/2018 12:45	4.321155	4/22/2018 0:45	0.479021
4/21/2018 13:00	3.372325	4/22/2018 1:00	0.479021
4/21/2018 13:15	3.296151	4/22/2018 1:15	1.334644
4/21/2018 13:30	3.231042	4/22/2018 1:30	1.298748
4/21/2018 13:45	3.274748	4/22/2018 1:45	1.470071
4/21/2018 14:00	4.205484	4/22/2018 2:00	1.504204
4/21/2018 14:15	4.267784	4/22/2018 2:15	1.504204
4/21/2018 14:30	3.929826	4/22/2018 2:30	1.250975
4/21/2018 14:45	3.929826	4/22/2018 2:45	1.475867
4/21/2018 15:00	2.770719	4/22/2018 3:00	1.786875
4/21/2018 15:15	2.932521	4/22/2018 3:15	1.786875
4/21/2018 15:30	2.661994	4/22/2018 3:30	1.987138
4/21/2018 15:45	2.766174	4/22/2018 3:45	2.720203
4/21/2018 16:00	2.614851	4/22/2018 4:00	3.52901
4/21/2018 16:15	2.260945	4/22/2018 4:15	2.686085
4/21/2018 16:30	2.159078	4/22/2018 4:30	0
4/21/2018 16:45	2.260945	4/22/2018 4:45	0.579293
4/21/2018 17:00	2.159078	4/22/2018 5:00	0.457427
4/21/2018 17:15	2.507834	4/22/2018 5:15	0.352984
4/21/2018 17:30	2.985097	4/22/2018 5:30	0.421028
4/21/2018 17:45	3.397063	4/22/2018 5:45	0.457427
4/21/2018 18:00	2.354925	4/22/2018 6:00	0.978875
4/21/2018 18:15	3.33901	4/22/2018 6:15	2.044005
4/21/2018 18:30	1.82611	4/22/2018 6:30	1.869635
4/21/2018 18:45	2.234648	4/22/2018 6:45	0
4/21/2018 19:00	2.234648	4/22/2018 7:00	1.31112
4/21/2018 19:15	2.234648	4/22/2018 7:15	2.029737
4/21/2018 19:30	3.277524	4/22/2018 7:30	1.781218
4/21/2018 19:45	3.805871	4/22/2018 7:45	2.472895
4/21/2018 20:00	3.289207	4/22/2018 8:00	2.472895
4/21/2018 20:15	3.207294	4/22/2018 8:15	2.177209
4/21/2018 20:30	4.151859	4/22/2018 8:30	2.177209
4/21/2018 20:45	4.003986	4/22/2018 8:45	2.177209
4/21/2018 21:00	4.760255	4/22/2018 9:00	1.926088
4/21/2018 21:15	5.223518	4/22/2018 9:15	2.177209
4/21/2018 21:30	4.39365	4/22/2018 9:30	2.785567
4/21/2018 21:45	3.896484	4/22/2018 9:45	3.085726
4/21/2018 22:00	2.182743	4/22/2018 10:00	2.552177
4/21/2018 22:15	1.848225	4/22/2018 10:15	3.01003
4/21/2018 22:30	1.494237	4/22/2018 10:30	2.814989
4/21/2018 22:45	1.494237	4/22/2018 10:45	2.325096
4/21/2018 23:00	1.448661	4/22/2018 11:00	2.097706
4/21/2018 23:15	1.024036	4/22/2018 11:15	2.146349
4/21/2018 23:30	0	4/22/2018 11:30	2.146349
4/21/2018 23:45	0.525118	4/22/2018 11:45	2.579381
4/22/2018 0:00	0.271295	4/22/2018 12:00	2.757446
4/22/2018 0:15	0.304569	4/22/2018 12:15	2.757446
4/22/2018 0:30	0.20194	4/22/2018 12:30	4.108262

Site 12 – MH 7.05 Flow Meter Data

4/22/2018 12:45	3.489462	4/22/2018 21:30	2.095703
4/22/2018 13:00	3.104719	4/22/2018 21:45	1.917442
4/22/2018 13:15	3.489462	4/22/2018 22:00	1.973769
4/22/2018 13:30	3.684869	4/22/2018 22:15	1.967443
4/22/2018 13:45	2.998602	4/22/2018 22:30	0
4/22/2018 14:00	3.039384	4/22/2018 22:45	0
4/22/2018 14:15	3.039384	4/22/2018 23:00	0
4/22/2018 14:30	2.998602	4/22/2018 23:15	0
4/22/2018 14:45	2.299491	4/22/2018 23:30	0
4/22/2018 15:00	2.427626	4/22/2018 23:45	1.35449
4/22/2018 15:15	2.427626	4/23/2018 0:00	1.513282
4/22/2018 15:30	2.239899	4/23/2018 0:15	1.555082
4/22/2018 15:45	2.520968	4/23/2018 0:30	2.031818
4/22/2018 16:00	2.848346	4/23/2018 0:45	2.14883
4/22/2018 16:15	2.757162	4/23/2018 1:00	1.656556
4/22/2018 16:30	2.643701	4/23/2018 1:15	0
4/22/2018 16:45	2.585114	4/23/2018 1:30	0
4/22/2018 17:00	2.21361	4/23/2018 1:45	0
4/22/2018 17:15	2.21361	4/23/2018 2:00	5.410419
4/22/2018 17:30	2.870598	4/23/2018 2:15	7.9366
4/22/2018 17:45	2.614063	4/23/2018 2:30	8.043416
4/22/2018 18:00	2.802473	4/23/2018 2:45	10.58918
4/22/2018 18:15	2.850927	4/23/2018 3:00	10.88565
4/22/2018 18:30	2.850927	4/23/2018 3:15	10.58918
4/22/2018 18:45	2.783269	4/23/2018 3:30	0
4/22/2018 19:00	2.783703	4/23/2018 3:45	0
4/22/2018 19:15	5.132838	4/23/2018 4:15	3.499393
4/22/2018 19:30	5.109344	4/23/2018 4:30	2.788612
4/22/2018 19:45	5.109344	4/23/2018 4:45	3.644423
4/22/2018 20:00	4.578562	4/23/2018 5:00	3.737805
4/22/2018 20:15	4.422874	4/23/2018 5:15	3.737805
4/22/2018 20:30	3.592096	4/23/2018 5:30	4.708185
4/22/2018 20:45	3.137287	4/23/2018 5:45	4.590561
4/22/2018 21:00	2.910352	4/23/2018 6:15	3.250953
4/22/2018 21:15	2.755636		

Site 13 – MH 3.06 Flow Meter Data

Inst Time	Flow (gpm)
4/24/2018 10:30	4.34403229
4/24/2018 11:45	4.57760715
4/24/2018 12:00	4.81816196
4/24/2018 12:15	6.14567423
4/24/2018 12:30	6.0703373
4/24/2018 12:45	8.63065815
4/24/2018 13:00	9.49786663
4/24/2018 13:15	9.8800621
4/24/2018 13:30	8.648242
4/24/2018 13:45	8.45880222
4/24/2018 14:00	7.63441849
4/24/2018 14:15	7.4120717
4/24/2018 14:30	7.63441849
4/24/2018 14:45	7.47302628
4/24/2018 15:00	7.8896966
4/24/2018 15:15	7.8896966
4/24/2018 15:30	7.99875641
4/24/2018 15:45	8.03521252
4/24/2018 16:00	8.07171917
4/24/2018 16:15	8.69591999
4/24/2018 16:30	9.6947155
4/24/2018 16:45	10.2363033
4/24/2018 17:00	10.267107
4/24/2018 17:15	10.267107
4/24/2018 17:30	10.1024675
4/24/2018 17:45	9.1138773
4/24/2018 18:00	9.07116032
4/24/2018 18:15	9.07116032
4/24/2018 18:30	9.07116032
4/24/2018 18:45	8.87647152
4/24/2018 19:00	9.31325722
4/24/2018 19:15	9.46370888
4/24/2018 19:30	9.83630085
4/24/2018 19:45	10.5280304
4/24/2018 20:00	11.9333553
4/24/2018 20:15	11.9655991
4/24/2018 20:30	12.0457888
4/24/2018 20:45	12.0457888
4/24/2018 21:00	11.7057114
4/24/2018 21:15	9.80463219
4/24/2018 21:30	9.80463219
4/24/2018 21:45	9.30893803
4/24/2018 22:00	9.51885319
4/24/2018 22:15	10.0257254
4/24/2018 22:30	9.38511848
4/24/2018 22:45	9.17417812
4/24/2018 23:00	9.17417812
4/24/2018 23:15	9.17417812
4/24/2018 23:30	8.7776804
4/24/2018 23:45	8.54901791
4/25/2018 0:00	8.17796326
4/25/2018 0:15	8.17796326
4/25/2018 0:30	8.17796326
4/25/2018 0:45	8.17796326
4/25/2018 1:00	8.74491692
4/25/2018 1:15	8.74491692
4/25/2018 1:30	8.74491692
4/25/2018 1:45	8.74491692
4/25/2018 2:00	8.74491692
4/25/2018 2:15	8.74491692
4/25/2018 2:30	9.12021351
4/25/2018 2:45	8.07756805
4/25/2018 3:00	7.71920776
4/25/2018 3:15	8.07756805
4/25/2018 3:30	8.07756805
4/25/2018 3:45	7.71920776
4/25/2018 4:00	7.90415812
4/25/2018 4:15	7.62509632
4/25/2018 4:30	8.53659725
4/25/2018 4:45	8.53659725
4/25/2018 5:00	8.53659725
4/25/2018 5:15	9.00772285
4/25/2018 5:30	9.13286781
4/25/2018 5:45	9.00772285
4/25/2018 6:00	8.50926018
4/25/2018 6:15	8.50926018
4/25/2018 6:30	8.11523151
4/25/2018 6:45	7.53461599
4/25/2018 7:00	6.70353556
4/25/2018 7:15	6.70353556
4/25/2018 7:30	6.70353556
4/25/2018 7:45	8.37941933
4/25/2018 8:00	9.09454536
4/25/2018 8:15	9.09454536
4/25/2018 8:30	8.54700756
4/25/2018 8:45	8.54700756
4/25/2018 9:00	7.76492882
4/25/2018 9:15	7.93417883
4/25/2018 9:30	7.93417883
4/25/2018 9:45	7.93417883
4/25/2018 10:00	8.50498295
4/25/2018 10:15	9.54396915
4/25/2018 10:30	10.8757191
4/25/2018 10:45	13.7987862
4/25/2018 11:00	13.4445019

Site 13 – MH 3.06 Flow Meter Data

4/25/2018 11:15	13.3442593
4/25/2018 11:30	13.6360769
4/25/2018 11:45	12.2724695
4/25/2018 12:00	12.2724695
4/25/2018 12:15	12.2724695
4/25/2018 12:30	9.78437233
4/25/2018 12:45	9.78437233
4/25/2018 13:00	9.57498264
4/25/2018 13:15	9.78437233
4/25/2018 13:30	9.57856846
4/25/2018 13:45	9.38617039
4/25/2018 14:00	10.0515165
4/25/2018 14:15	8.81731224
4/25/2018 14:30	8.81731224
4/25/2018 14:45	10.2857304
4/25/2018 15:00	10.4926205
4/25/2018 15:15	10.2857304
4/25/2018 15:30	10.7245016
4/25/2018 15:45	10.2736502
4/25/2018 16:00	9.65090752
4/25/2018 16:15	9.05191898
4/25/2018 16:30	9.05191898
4/25/2018 16:45	9.05191898
4/25/2018 17:00	9.81730175
4/25/2018 17:15	10.1591644
4/25/2018 17:30	10.1883039
4/25/2018 17:45	10.384716
4/25/2018 18:00	10.384716
4/25/2018 18:15	8.32998657
4/25/2018 18:30	8.32998657
4/25/2018 18:45	8.32998657
4/25/2018 19:00	8.46460819
4/25/2018 19:15	8.46460819
4/25/2018 19:30	8.46460819
4/25/2018 19:45	8.31204319
4/25/2018 20:00	8.31204319
4/25/2018 20:15	8.17335892
4/25/2018 20:30	8.31204319
4/25/2018 20:45	8.54160786
4/25/2018 21:00	8.54160786
4/25/2018 21:15	8.56889725
4/25/2018 21:30	8.54160786
4/25/2018 21:45	8.65253735
4/25/2018 22:00	8.38551903
4/25/2018 22:15	7.20768309
4/25/2018 22:30	8.46460819
4/25/2018 22:45	8.38761806
4/25/2018 23:00	8.38761806
4/25/2018 23:15	8.33643055
4/25/2018 23:30	8.33643055
4/25/2018 23:45	8.52085972
4/26/2018 0:00	8.5741148
4/26/2018 0:15	8.34372425
4/26/2018 0:30	7.7682004
4/26/2018 0:45	7.7682004
4/26/2018 1:00	7.34267187
4/26/2018 1:15	7.08244228
4/26/2018 1:30	7.35953665
4/26/2018 1:45	7.69672966
4/26/2018 2:00	7.69672966
4/26/2018 2:15	8.61412144
4/26/2018 2:30	9.30673504
4/26/2018 2:45	9.30673504
4/26/2018 3:00	9.30673504
4/26/2018 3:15	7.87757301
4/26/2018 3:30	8.62736988
4/26/2018 3:45	8.55960178
4/26/2018 4:00	8.55960178
4/26/2018 4:15	8.82127953
4/26/2018 4:30	9.15931797
4/26/2018 4:45	9.5409565
4/26/2018 5:00	9.5409565
4/26/2018 5:15	9.75209999
4/26/2018 5:30	9.95026112
4/26/2018 5:45	10.3778248
4/26/2018 6:00	8.35177135
4/26/2018 6:15	9.09434414
4/26/2018 6:30	9.09434414
4/26/2018 6:45	9.29560375
4/26/2018 7:00	8.98295593
4/26/2018 7:15	8.98295593
4/26/2018 7:30	8.3235569
4/26/2018 7:45	8.3235569
4/26/2018 8:00	8.21183109
4/26/2018 8:15	8.3235569
4/26/2018 8:30	8.50498295
4/26/2018 8:45	8.88531876
4/26/2018 9:00	8.91905975
4/26/2018 9:15	8.87885571
4/26/2018 9:30	8.87885571
4/26/2018 9:45	9.00948334
4/26/2018 10:00	9.05027962
4/26/2018 10:15	8.98532772
4/26/2018 10:30	10.593812
4/26/2018 10:45	8.32998657
4/26/2018 11:00	8.32998657

Site 13 – MH 3.06 Flow Meter Data

4/26/2018 11:15	8.8405714
4/26/2018 11:30	9.16999245
4/26/2018 11:45	8.64855862
4/26/2018 12:00	8.64855862
4/26/2018 12:15	8.64855862
4/26/2018 12:30	9.11573124
4/26/2018 12:45	8.08478642
4/26/2018 13:00	8.08478642
4/26/2018 13:15	8.35608768
4/26/2018 13:30	8.35608768
4/26/2018 13:45	8.35608768
4/26/2018 14:00	8.67089748
4/26/2018 14:15	8.79016972
4/26/2018 14:30	8.80098724
4/26/2018 14:45	8.63867569
4/26/2018 15:00	8.83347607
4/26/2018 15:15	9.30128002
4/26/2018 15:30	9.39858532
4/26/2018 15:45	11.014843
4/26/2018 16:00	11.2593918
4/26/2018 16:15	9.67008209
4/26/2018 16:30	9.60725117
4/26/2018 16:45	9.23971558
4/26/2018 17:00	8.82735443
4/26/2018 17:15	8.83854961
4/26/2018 17:30	9.1187706
4/26/2018 17:45	9.61275768
4/26/2018 18:00	9.8329525
4/26/2018 18:15	9.32764912
4/26/2018 18:30	9.32764912
4/26/2018 18:45	9.688694
4/26/2018 19:00	9.18195343
4/26/2018 19:15	9.8194828
4/26/2018 19:30	10.252718
4/26/2018 19:45	10.7316628
4/26/2018 20:00	9.60407448
4/26/2018 20:15	9.38703346
4/26/2018 20:30	9.38703346
4/26/2018 20:45	7.84552145
4/26/2018 21:00	22.8809738
4/26/2018 21:15	21.8970184
4/26/2018 21:30	21.8970184
4/26/2018 21:45	21.8970184
4/26/2018 22:00	10.146677
4/26/2018 22:15	10.146677
4/26/2018 22:30	10.146677
4/26/2018 22:45	8.69233322
4/26/2018 23:00	8.38551903
4/26/2018 23:15	8.15335274
4/26/2018 23:30	8.15335274
4/26/2018 23:45	8.38551903
4/27/2018 0:00	8.38551903
4/27/2018 0:15	8.10785389
4/27/2018 0:30	9.07365608
4/27/2018 0:45	8.68082809
4/27/2018 1:00	8.16169262
4/27/2018 1:15	8.21469116
4/27/2018 1:30	8.21469116
4/27/2018 1:45	8.21469116
4/27/2018 2:00	8.21469116
4/27/2018 2:15	8.21469116
4/27/2018 2:30	8.37368584
4/27/2018 2:45	8.58567715
4/27/2018 3:00	8.58567715
4/27/2018 3:15	8.58567715
4/27/2018 3:30	8.58567715
4/27/2018 3:45	8.0026989
4/27/2018 4:00	7.54218245
4/27/2018 4:15	7.54218245
4/27/2018 4:30	8.18315887
4/27/2018 4:45	8.46460819
4/27/2018 5:00	8.46460819
4/27/2018 5:15	8.68164921
4/27/2018 5:30	8.68164921
4/27/2018 5:45	9.94185638
4/27/2018 6:00	10.0381565
4/27/2018 6:15	10.2610226
4/27/2018 6:30	10.29669
4/27/2018 6:45	10.5252953
4/27/2018 7:00	9.21851826
4/27/2018 7:15	9.21851826
4/27/2018 7:30	9.74198818
4/27/2018 7:45	9.74198818
4/27/2018 8:00	9.74198818
4/27/2018 8:15	9.74198818
4/27/2018 8:30	8.28456116
4/27/2018 8:45	8.28456116
4/27/2018 9:00	8.24756718
4/27/2018 9:15	7.9220047
4/27/2018 9:30	7.5964427
4/27/2018 9:45	8.19324493
4/27/2018 10:00	7.76509714
4/27/2018 10:15	7.76509714
4/27/2018 10:30	9.44065189
4/27/2018 10:45	9.23560429
4/27/2018 11:00	8.52935219

Site 13 – MH 3.06 Flow Meter Data

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4/27/2018 11:30	8.52935219
4/27/2018 11:45	8.52935219
4/27/2018 12:00	8.71871948
4/27/2018 12:15	9.49483776
4/27/2018 12:30	8.44105339
4/27/2018 12:45	9.53442001
4/27/2018 13:00	7.46361446
4/27/2018 13:15	7.30097723
4/27/2018 13:30	7.30097723
4/27/2018 13:45	7.34416199
4/27/2018 14:00	7.34416199
4/27/2018 14:15	8.15961361
4/27/2018 14:30	8.37018394
4/27/2018 14:45	9.07219887
4/27/2018 15:00	8.87148857
4/27/2018 15:15	9.07219887
4/27/2018 15:30	9.07219887
4/27/2018 15:45	8.99575233
4/27/2018 16:00	8.31618309
4/27/2018 16:15	7.68283272
4/27/2018 16:30	7.45255661
4/27/2018 16:45	7.13011074
4/27/2018 17:00	7.29016066
4/27/2018 17:15	7.29016066
4/27/2018 17:30	7.99217606
4/27/2018 17:45	7.99217606
4/27/2018 18:00	8.35371017
4/27/2018 18:15	7.99217606
4/27/2018 18:30	7.99217606
4/27/2018 18:45	7.59920788
4/27/2018 19:00	7.70347548
4/27/2018 19:15	7.87247705
4/27/2018 19:30	7.92911386
4/27/2018 19:45	7.92911386
4/27/2018 20:00	8.69013882
4/27/2018 20:15	8.67773247
4/27/2018 20:30	8.75516796
4/27/2018 20:45	10.4427137
4/27/2018 21:00	10.4427137
4/27/2018 21:15	10.4427137
4/27/2018 21:30	10.1048374
4/27/2018 21:45	8.24756718
4/27/2018 22:00	8.12896538
4/27/2018 22:15	8.09219074
4/27/2018 22:30	7.94970131
4/27/2018 22:45	7.94970131
4/27/2018 23:00	8.03052616
4/27/2018 23:15	7.5202961
4/27/2018 23:30	6.84521246
4/27/2018 23:45	7.40409565
4/28/2018 0:00	8.03052616
4/28/2018 0:15	8.09473515
4/28/2018 0:30	8.35608768
4/28/2018 0:45	8.35608768
4/28/2018 1:00	8.09473515
4/28/2018 1:15	9.57086658
4/28/2018 1:30	8.46246815
4/28/2018 1:45	8.46246815
4/28/2018 2:00	8.46246815
4/28/2018 2:15	8.46246815
4/28/2018 2:30	7.32514143
4/28/2018 2:45	7.32514143
4/28/2018 3:00	7.32514143
4/28/2018 3:15	7.44094515
4/28/2018 3:30	8.24756718
4/28/2018 3:45	8.24756718
4/28/2018 4:00	8.24756718
4/28/2018 4:15	8.41034794
4/28/2018 4:30	8.41034794
4/28/2018 4:45	7.8774271
4/28/2018 5:00	7.8774271
4/28/2018 5:15	7.8774271
4/28/2018 5:30	7.74961376
4/28/2018 5:45	7.57871485
4/28/2018 6:00	8.83019257
4/28/2018 6:15	9.02931213
4/28/2018 6:30	8.50246811
4/28/2018 6:45	8.50246811
4/28/2018 7:00	8.50246811
4/28/2018 7:15	8.46461868
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4/28/2018 7:45	11.0960293
4/28/2018 8:00	11.0960293
4/28/2018 8:15	9.28572559
4/28/2018 8:30	9.19756508
4/28/2018 8:45	9.10867977
4/28/2018 9:00	9.50969124
4/28/2018 9:15	8.8561945
4/28/2018 9:30	8.9101963
4/28/2018 9:45	9.25689983
4/28/2018 10:00	9.86590672
4/28/2018 10:15	9.46310711
4/28/2018 10:30	9.46310711
4/28/2018 10:45	8.63300991
4/28/2018 11:00	8.82240391

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4/28/2018 11:30	11.2112665
4/28/2018 11:45	13.4496765
4/28/2018 12:00	13.2489891
4/28/2018 12:15	12.8741608
4/28/2018 12:30	11.0756044
4/28/2018 12:45	12.5893373
4/28/2018 13:00	11.8139791
4/28/2018 13:15	11.0756044
4/28/2018 13:30	11.8139791
4/28/2018 13:45	11.8139791
4/28/2018 14:00	11.0228634
4/28/2018 14:15	8.79902935
4/28/2018 14:30	8.81162167
4/28/2018 14:45	8.81162167
4/28/2018 15:00	8.81162167
4/28/2018 15:15	12.4053097
4/28/2018 15:30	12.4053097
4/28/2018 15:45	11.3508711
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4/28/2018 16:15	11.7182579
4/28/2018 16:30	11.1515865
4/28/2018 16:45	10.0735264
4/28/2018 17:00	10.0735264
4/28/2018 17:15	9.90290928
4/28/2018 17:30	9.79755974
4/28/2018 17:45	9.90290928
4/28/2018 18:00	9.90290928
4/28/2018 18:15	9.65159893
4/28/2018 18:30	10.8236456
4/28/2018 18:45	10.3389988
4/28/2018 19:00	8.63945866
4/28/2018 19:15	8.62849617
4/28/2018 19:30	8.00131607
4/28/2018 19:45	8.18085861
4/28/2018 20:00	8.3719101
4/28/2018 20:15	7.73810434
4/28/2018 20:30	7.73810434
4/28/2018 20:45	8.2908268
4/28/2018 21:00	10.060935
4/28/2018 21:15	8.2908268
4/28/2018 21:30	7.9307375
4/28/2018 21:45	8.10174274
4/28/2018 22:00	8.10174274
4/28/2018 22:15	7.27825451
4/28/2018 22:30	8.10174274
4/28/2018 22:45	8.65084171
4/28/2018 23:00	9.18020248
4/28/2018 23:15	9.28241158
4/28/2018 23:30	9.28241158
4/28/2018 23:45	10.1262674
4/29/2018 0:00	10.1262674
4/29/2018 0:15	9.28241158
4/29/2018 0:30	8.28033352
4/29/2018 0:45	8.18500519
4/29/2018 1:00	8.21829891
4/29/2018 1:15	8.01662827
4/29/2018 1:30	8.21829891
4/29/2018 1:45	8.37018394
4/29/2018 2:00	8.47818661
4/29/2018 2:15	8.47818661
4/29/2018 2:30	8.65084171
4/29/2018 2:45	8.80219364
4/29/2018 3:00	8.58618927
4/29/2018 3:15	8.58618927
4/29/2018 3:30	8.5967741
4/29/2018 3:45	8.58618927
4/29/2018 4:00	7.99217606
4/29/2018 4:15	8.17021084
4/29/2018 4:30	7.99217606
4/29/2018 4:45	7.93817472
4/29/2018 5:00	8.29303646
4/29/2018 5:15	7.06923389
4/29/2018 5:30	6.76673985
4/29/2018 5:45	6.76673985
4/29/2018 6:00	7.56016588
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4/29/2018 6:30	7.77617121
4/29/2018 6:45	7.77617121
4/29/2018 7:00	8.35980034
4/29/2018 7:15	9.11487961
4/29/2018 7:30	8.91322517
4/29/2018 7:45	7.61114597
4/29/2018 8:00	8.71295452
4/29/2018 8:15	8.91322517
4/29/2018 8:30	8.62871647
4/29/2018 8:45	9.12620068
4/29/2018 9:00	13.1599445
4/29/2018 9:15	11.7722597
4/29/2018 9:30	11.7722597
4/29/2018 9:45	12.953721
4/29/2018 10:00	12.953721
4/29/2018 10:15	12.5643196
4/29/2018 10:30	13.8252716
4/29/2018 10:45	10.6278772
4/29/2018 11:00	9.93785858

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4/29/2018 11:15	12.2042685
4/29/2018 11:30	12.2042685
4/29/2018 11:45	11.5830765
4/29/2018 12:00	11.0723143
4/29/2018 12:15	10.4907961
4/29/2018 12:30	10.2974777
4/29/2018 12:45	8.33124352
4/29/2018 13:00	8.52274036
4/29/2018 13:15	8.52274036
4/29/2018 13:30	8.25957012
4/29/2018 13:45	8.66703606
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4/29/2018 14:15	9.83141994
4/29/2018 14:30	8.08416557
4/29/2018 14:45	10.3204861
4/29/2018 15:00	9.24656677
4/29/2018 15:15	9.46250534
4/29/2018 15:30	10.1574173
4/29/2018 15:45	10.1574173
4/29/2018 16:00	10.3908901
4/29/2018 16:15	13.7230663
4/29/2018 16:30	12.070013
4/29/2018 16:45	10.1449575
4/29/2018 17:00	10.2806253
4/29/2018 17:15	10.1449575
4/29/2018 17:30	8.52233028
4/29/2018 17:45	10.0042639
4/29/2018 18:00	10.0042639
4/29/2018 18:15	10.1796961
4/29/2018 18:30	9.96116543
4/29/2018 18:45	9.96116543
4/29/2018 19:00	9.96116543
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4/29/2018 19:30	9.32575798
4/29/2018 19:45	9.05347633
4/29/2018 20:00	8.8561945
4/29/2018 20:15	7.78575802
4/29/2018 20:30	8.23123932
4/29/2018 20:45	7.75681686
4/29/2018 21:00	7.41477585
4/29/2018 21:15	7.84623623
4/29/2018 21:30	7.84623623
4/29/2018 21:45	7.80566454
4/29/2018 22:00	8.20818043
4/29/2018 22:15	8.20818043
4/29/2018 22:30	8.4241848
4/29/2018 22:45	8.4241848
4/29/2018 23:00	8.73300362
4/29/2018 23:15	8.61184216
4/29/2018 23:30	7.68283272
4/29/2018 23:45	7.68283272
4/30/2018 0:00	8.04980373
4/30/2018 0:15	7.08479261
4/30/2018 0:30	7.5271678
4/30/2018 0:45	7.62074184
4/30/2018 1:00	7.70018291
4/30/2018 1:15	7.97228384
4/30/2018 1:30	8.27236652
4/30/2018 1:45	8.30586624
4/30/2018 2:00	8.30586624
4/30/2018 2:15	8.30586624
4/30/2018 2:30	8.64019012
4/30/2018 2:45	8.64019012
4/30/2018 3:00	8.15417957
4/30/2018 3:15	7.88417339
4/30/2018 3:30	8.15417957
4/30/2018 3:45	8.15417957
4/30/2018 4:00	7.23448849
4/30/2018 4:15	7.75292349
4/30/2018 4:30	8.30083847
4/30/2018 4:45	8.30083847
4/30/2018 5:00	8.5776701
4/30/2018 5:15	8.67773247
4/30/2018 5:30	9.56208611
4/30/2018 5:45	9.56208611
4/30/2018 6:00	8.5776701
4/30/2018 6:15	9.50420856
4/30/2018 6:30	8.20818043
4/30/2018 6:45	8.20818043
4/30/2018 7:00	9.36101723
4/30/2018 7:15	9.08511639
4/30/2018 7:30	9.1139946
4/30/2018 7:45	9.71651936
4/30/2018 8:00	9.93985748
4/30/2018 8:15	10.7185621
4/30/2018 8:30	9.93985748
4/30/2018 8:45	9.65594482
4/30/2018 9:00	9.62891102
4/30/2018 9:15	9.65594482
4/30/2018 9:30	9.62891102
4/30/2018 9:45	9.62891102
4/30/2018 10:00	10.5481949
4/30/2018 10:15	10.5481949
4/30/2018 10:30	9.82200623
4/30/2018 10:45	11.7392206
4/30/2018 11:00	12.3786373

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4/30/2018 11:15	9.82200623
4/30/2018 11:30	9.99297333
4/30/2018 11:45	9.39931488
4/30/2018 12:00	9.39931488
4/30/2018 12:15	9.39931488
4/30/2018 12:30	9.02334213
4/30/2018 12:45	9.02334213
4/30/2018 13:00	9.02334213
4/30/2018 13:15	9.02334213
4/30/2018 13:30	9.02334213
4/30/2018 13:45	10.4904804
4/30/2018 14:00	10.2539034
4/30/2018 14:15	10.2539034
4/30/2018 14:30	9.5121727
4/30/2018 14:45	8.7049036
4/30/2018 15:00	8.12068176
4/30/2018 15:15	8.12068176
4/30/2018 15:30	7.42329168
4/30/2018 15:45	7.42329168
4/30/2018 16:00	11.3246231
4/30/2018 16:15	11.3246231
4/30/2018 16:30	10.0184088
4/30/2018 16:45	10.6085711
4/30/2018 17:00	10.2459297
4/30/2018 17:15	9.18447304
4/30/2018 17:30	9.18447304
4/30/2018 17:45	8.9066
4/30/2018 18:00	9.10271835
4/30/2018 18:15	8.21374226
4/30/2018 18:30	8.21374226
4/30/2018 18:45	8.21374226
4/30/2018 19:00	8.00284481
4/30/2018 19:15	7.83196783
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4/30/2018 19:45	8.00707054
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4/30/2018 20:15	7.69797802
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4/30/2018 20:45	7.93244839
4/30/2018 21:00	7.93244839
4/30/2018 21:15	7.42216682
4/30/2018 21:30	8.11108208
4/30/2018 21:45	7.14482975
4/30/2018 22:00	7.14482975
4/30/2018 22:15	7.4914856
4/30/2018 22:30	7.65397024
4/30/2018 22:45	7.65397024
4/30/2018 23:00	7.88416386
4/30/2018 23:15	7.4914856
4/30/2018 23:30	8.68668365
4/30/2018 23:45	8.74166298
5/1/2018 0:00	8.68668365
5/1/2018 0:15	8.24685192
5/1/2018 0:30	8.24685192
5/1/2018 0:45	8.24685192
5/1/2018 1:00	8.07194614
5/1/2018 1:15	8.07194614
5/1/2018 1:30	7.91697788
5/1/2018 1:45	7.86199808
5/1/2018 2:00	7.0855608
5/1/2018 2:15	7.02370214
5/1/2018 2:30	7.02370214
5/1/2018 2:45	7.02370214
5/1/2018 3:00	7.93244839
5/1/2018 3:15	9.33891106
5/1/2018 3:30	9.32684135
5/1/2018 3:45	9.2799921
5/1/2018 4:00	9.07705307
5/1/2018 4:15	8.64736938
5/1/2018 4:30	8.64736938
5/1/2018 4:45	8.64736938
5/1/2018 5:00	8.4650774
5/1/2018 5:15	9.8601656
5/1/2018 5:30	10.6930494
5/1/2018 5:45	11.4640684
5/1/2018 6:00	9.52194214
5/1/2018 6:15	9.12479973
5/1/2018 6:30	10.3201838
5/1/2018 6:45	8.5390358
5/1/2018 7:00	8.20191574
5/1/2018 7:15	8.1918726
5/1/2018 7:30	7.83479834
5/1/2018 7:45	7.83479834
5/1/2018 8:00	8.73894501
5/1/2018 8:15	9.71926594
5/1/2018 8:30	9.71926594
5/1/2018 8:45	9.1372261
5/1/2018 9:00	7.777946
5/1/2018 9:15	7.60785389
5/1/2018 9:30	7.777946
5/1/2018 9:45	7.60785389
5/1/2018 10:00	7.96870947
5/1/2018 10:15	8.48623848
5/1/2018 10:30	8.57095432
5/1/2018 10:45	7.79175663
5/1/2018 11:00	8.88884449

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5/1/2018 11:30	8.4650774
5/1/2018 11:45	8.40141296
5/1/2018 12:00	8.21768665
5/1/2018 12:15	8.00284481
5/1/2018 12:30	8.00284481
5/1/2018 12:45	7.94226933
5/1/2018 13:00	8.0819149
5/1/2018 13:15	8.36192608
5/1/2018 13:30	10.1265297
5/1/2018 13:45	8.25987434
5/1/2018 14:00	10.2634726
5/1/2018 14:15	10.0390253
5/1/2018 14:30	9.33652782
5/1/2018 14:45	8.42143154
5/1/2018 15:00	9.1259737
5/1/2018 15:15	9.04192257
5/1/2018 15:30	9.41165066
5/1/2018 15:45	8.84742069
5/1/2018 16:00	9.61955643
5/1/2018 16:15	8.9703331
5/1/2018 16:30	8.9703331
5/1/2018 16:45	8.9703331
5/1/2018 17:00	8.77645874
5/1/2018 17:15	8.09839725
5/1/2018 17:30	8.09839725
5/1/2018 17:45	7.98895931
5/1/2018 18:00	8.09839725
5/1/2018 18:15	8.7914238
5/1/2018 18:30	8.60141563
5/1/2018 18:45	8.41269684
5/1/2018 19:00	8.65925789
5/1/2018 19:15	10.3863974
5/1/2018 19:30	10.6117544
5/1/2018 19:45	10.85355
5/1/2018 20:00	10.4346838
5/1/2018 20:15	10.6214352
5/1/2018 20:30	10.6214352
5/1/2018 20:45	10.4093571
5/1/2018 21:00	10.2781639
5/1/2018 21:15	10.6984415
5/1/2018 21:30	10.6984415
5/1/2018 21:45	8.0819149
5/1/2018 22:00	7.59640503
5/1/2018 22:15	7.76367331
5/1/2018 22:30	7.76367331
5/1/2018 22:45	7.76367331
5/1/2018 23:00	8.6532011
5/1/2018 23:15	8.72006702
5/1/2018 23:30	8.53219318
5/1/2018 23:45	8.68668365
5/2/2018 0:00	8.74390888
5/2/2018 0:15	8.74390888
5/2/2018 0:30	8.93939972
5/2/2018 0:45	8.87795925
5/2/2018 1:00	8.20368481
5/2/2018 1:15	8.20368481
5/2/2018 1:30	8.20368481
5/2/2018 1:45	8.02693558
5/2/2018 2:00	8.36705494
5/2/2018 2:15	9.18149471
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5/2/2018 2:45	9.18149471
5/2/2018 3:00	8.36705494
5/2/2018 3:15	8.36705494
5/2/2018 3:30	8.36705494
5/2/2018 3:45	8.36705494
5/2/2018 4:00	8.9066
5/2/2018 4:15	9.524189
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5/2/2018 5:00	10.3938293
5/2/2018 5:15	10.795784
5/2/2018 5:30	10.795784
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5/2/2018 6:00	10.795784
5/2/2018 6:15	10.2459297
5/2/2018 6:30	9.69154358
5/2/2018 6:45	8.79204845
5/2/2018 7:00	7.96278143
5/2/2018 7:15	8.04512882
5/2/2018 7:30	7.86369801
5/2/2018 7:45	8.04512882
5/2/2018 8:00	9.24779701
5/2/2018 8:15	9.45142746
5/2/2018 8:30	9.45142746
5/2/2018 8:45	8.38251686
5/2/2018 9:00	8.38251686
5/2/2018 9:15	20.3902435
5/2/2018 9:30	21.1894245
5/2/2018 9:45	28.5521526
5/2/2018 10:00	27.6045475
5/2/2018 10:15	29.9335308
5/2/2018 10:30	29.9335308
5/2/2018 10:45	21.9958477
5/2/2018 11:00	19.5514393

Site 13 – MH 3.06 Flow Meter Data

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5/2/2018 12:00	21.6226711
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5/2/2018 12:30	24.4760647
5/2/2018 12:45	20.6580944
5/2/2018 13:00	20.6580944
5/2/2018 13:15	21.938427
5/2/2018 13:30	21.938427
5/2/2018 13:45	21.938427
5/2/2018 14:00	26.3220329
5/2/2018 14:15	26.2626877
5/2/2018 14:30	26.2626877
5/2/2018 14:45	20.6847076
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5/2/2018 15:15	20.3850231
5/2/2018 15:30	18.9170685
5/2/2018 15:45	18.9605999
5/2/2018 16:00	20.345602
5/2/2018 16:15	25.4153519
5/2/2018 16:30	25.4153519
5/2/2018 16:45	25.4153519
5/2/2018 17:00	25.125864
5/2/2018 17:15	26.0413933
5/2/2018 17:30	25.4633121
5/2/2018 17:45	25.4633121
5/2/2018 18:00	24.7143517
5/2/2018 18:15	27.8959827
5/2/2018 18:30	27.8959827
5/2/2018 18:45	26.3049603
5/2/2018 19:00	24.8635502
5/2/2018 19:15	25.3023205
5/2/2018 19:30	25.3023205
5/2/2018 19:45	25.3023205
5/2/2018 20:00	25.3023205
5/2/2018 20:15	23.9478855
5/2/2018 20:30	23.4009876
5/2/2018 20:45	23.4009876
5/2/2018 21:00	23.1084766
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5/2/2018 21:30	23.1084766
5/2/2018 21:45	23.1084766
5/2/2018 22:00	20.2272396
5/2/2018 22:15	19.4347763
5/2/2018 22:30	17.1210766
5/2/2018 22:45	17.3216305
5/2/2018 23:00	17.7423973
5/2/2018 23:15	17.7423973
5/2/2018 23:30	23.3850327
5/2/2018 23:45	20.497261
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5/3/2018 0:15	19.7999039
5/3/2018 0:30	20.4026146
5/3/2018 0:45	20.4026146
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5/3/2018 1:30	20.6713295
5/3/2018 1:45	20.4299889
5/3/2018 2:00	20.1805172
5/3/2018 2:15	20.033947
5/3/2018 2:30	20.1894321
5/3/2018 2:45	20.4513187
5/3/2018 3:00	20.4513187
5/3/2018 3:15	20.7295685
5/3/2018 3:30	21.1469421
5/3/2018 3:45	21.2243595
5/3/2018 4:00	21.6692543
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5/3/2018 4:45	21.218998
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5/3/2018 5:15	22.1454792
5/3/2018 5:30	24.8333225
5/3/2018 5:45	24.8333225
5/3/2018 6:00	22.8722858
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5/3/2018 6:30	27.170435
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5/3/2018 7:15	26.5672913
5/3/2018 7:30	22.0812073
5/3/2018 7:45	21.1514797
5/3/2018 8:00	21.4013424
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5/3/2018 8:30	21.4013424
5/3/2018 8:45	21.4013424
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5/3/2018 10:15	16.0346565
5/3/2018 10:30	16.9274483
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5/3/2018 11:00	17.1348038

Site 13 – MH 3.06 Flow Meter Data

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5/3/2018 13:00	20.3688488
5/3/2018 13:15	20.3688488
5/3/2018 13:30	20.7628059
5/3/2018 13:45	20.2102413
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5/3/2018 14:15	20.7628059
5/3/2018 14:30	25.6930161
5/3/2018 14:45	25.6930161
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5/3/2018 15:45	23.0577526
5/3/2018 16:00	22.913641
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5/3/2018 16:30	22.913641
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5/3/2018 17:30	25.344677
5/3/2018 17:45	27.4944363
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5/3/2018 18:30	27.4944363
5/3/2018 18:45	27.8091507
5/3/2018 19:00	28.2640572
5/3/2018 19:15	26.5705776
5/3/2018 19:30	26.5705776
5/3/2018 19:45	29.2795124
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5/3/2018 21:00	26.0900879
5/3/2018 21:15	26.5304508
5/3/2018 21:30	23.0435352
5/3/2018 21:45	17.9340706
5/3/2018 22:00	22.7694416
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5/3/2018 22:30	17.9340706
5/3/2018 22:45	21.371666
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5/3/2018 23:45	21.371666
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5/4/2018 0:15	21.0821419
5/4/2018 0:30	21.0821419
5/4/2018 0:45	21.9566708
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5/4/2018 1:15	23.1990814
5/4/2018 1:30	21.9566708
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5/4/2018 6:45	19.8331985
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5/4/2018 7:30	20.0740185
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5/4/2018 8:30	21.8827152
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5/4/2018 9:00	21.0821419
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5/4/2018 9:45	21.3316498
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5/4/2018 10:15	21.1881199
5/4/2018 10:30	23.9629192
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5/4/2018 11:00	21.1881199

Site 13 – MH 3.06 Flow Meter Data

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5/4/2018 12:30	20.7328205
5/4/2018 12:45	22.2065239
5/4/2018 13:00	20.3491802
5/4/2018 13:15	20.3491802
5/4/2018 13:30	20.3491802
5/4/2018 13:45	20.5401077
5/4/2018 14:00	20.5401077
5/4/2018 14:15	20.8103142
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5/4/2018 15:30	24.775095
5/4/2018 15:45	27.6223087
5/4/2018 16:00	25.9741535
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5/4/2018 18:15	18.8273735
5/4/2018 18:30	21.4513264
5/4/2018 18:45	21.4513264
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5/4/2018 19:30	19.7959919
5/4/2018 19:45	17.0078239
5/4/2018 20:00	17.2491341
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5/4/2018 20:30	18.233036
5/4/2018 20:45	17.5107765
5/4/2018 21:00	17.5107765
5/4/2018 21:15	17.5107765
5/4/2018 21:30	17.0866184
5/4/2018 21:45	17.0866184
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5/4/2018 22:45	19.0906944
5/4/2018 23:00	18.4969196
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5/4/2018 23:30	20.6094437
5/4/2018 23:45	20.9245968
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5/5/2018 0:15	21.5211201
5/5/2018 0:30	21.8897133
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5/5/2018 1:15	22.768713
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5/5/2018 2:30	20.0983086
5/5/2018 2:45	18.2563591
5/5/2018 3:00	18.2563591
5/5/2018 3:15	18.9585266
5/5/2018 3:30	20.4167995
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5/5/2018 4:45	20.2102413
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5/5/2018 5:30	22.593195
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5/5/2018 9:00	22.9926701
5/5/2018 9:15	22.1803646
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5/5/2018 10:15	25.5733128
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5/5/2018 11:00	25.5569363

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5/5/2018 17:45	23.3582687
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5/5/2018 19:15	30.1345577
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5/5/2018 20:30	20.8950138
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5/5/2018 21:15	23.6695328
5/5/2018 21:30	22.6295261
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5/5/2018 23:45	18.9488182
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5/6/2018 0:15	19.1008148
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5/6/2018 1:00	18.2116985
5/6/2018 1:15	16.2829323
5/6/2018 1:30	16.2829323
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5/6/2018 5:45	20.2982006
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5/6/2018 6:45	21.1921253
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5/6/2018 8:00	19.7339592
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5/6/2018 8:45	19.1304359
5/6/2018 9:00	19.6077843
5/6/2018 9:15	20.3612728
5/6/2018 9:30	23.1700974
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5/6/2018 10:00	29.3047848
5/6/2018 10:15	32.936203
5/6/2018 10:30	27.6780262
5/6/2018 10:45	27.5125332
5/6/2018 11:00	25.1562271

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5/6/2018 12:30	22.4846287
5/6/2018 12:45	25.8624249
5/6/2018 13:00	25.8624249
5/6/2018 13:15	20.5057774
5/6/2018 13:30	21.26478
5/6/2018 13:45	22.3876762
5/6/2018 14:00	22.3876762
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5/6/2018 16:15	21.3941784
5/6/2018 16:30	21.3941784
5/6/2018 16:45	23.1160755
5/6/2018 17:00	23.1160755
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5/6/2018 17:45	27.0705452
5/6/2018 18:00	23.1052723
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5/7/2018 5:45	20.9679298
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5/7/2018 6:15	21.2195988
5/7/2018 6:30	21.2195988
5/7/2018 6:45	20.2181969
5/7/2018 7:00	21.8297997
5/7/2018 7:15	20.7996006
5/7/2018 7:30	20.7996006
5/7/2018 7:45	19.7425156
5/7/2018 8:00	19.7425156
5/7/2018 8:15	18.2040596
5/7/2018 8:30	18.2040596
5/7/2018 8:45	18.2040596
5/7/2018 9:00	17.7813396
5/7/2018 9:15	17.7813396
5/7/2018 9:30	17.7813396
5/7/2018 9:45	17.7074413
5/7/2018 10:00	18.507658
5/7/2018 10:15	23.5089245
5/7/2018 10:30	23.5089245
5/7/2018 10:45	23.5089245
5/7/2018 11:00	24.808197

Site 13 – MH 3.06 Flow Meter Data

5/7/2018 11:15	25.5290699
5/7/2018 11:30	25.4098701
5/7/2018 11:45	27.9873371
5/7/2018 12:00	33.8589211
5/7/2018 12:15	33.8589211
5/7/2018 12:30	26.7014351
5/7/2018 12:45	26.7014351
5/7/2018 13:00	22.9800987
5/7/2018 13:15	22.4266491
5/7/2018 13:30	21.6707897
5/7/2018 13:45	20.6309223
5/7/2018 14:00	16.9137878
5/7/2018 14:15	16.9137878
5/7/2018 14:30	16.2920113
5/7/2018 14:45	17.2662315
5/7/2018 15:00	16.1236115
5/7/2018 15:15	15.2344198
5/7/2018 15:30	16.8737373
5/7/2018 15:45	16.8737373
5/7/2018 16:00	16.1568203
5/7/2018 16:15	19.9796486
5/7/2018 16:30	22.3368874
5/7/2018 16:45	22.5107746
5/7/2018 17:00	20.9981346
5/7/2018 17:15	20.9981346
5/7/2018 17:30	19.9278316
5/7/2018 17:45	19.6875305
5/7/2018 18:00	16.7439613
5/7/2018 18:15	16.5324764
5/7/2018 18:30	13.8902388
5/7/2018 18:45	13.8902388
5/7/2018 19:00	16.1594963
5/7/2018 19:15	17.0371113
5/7/2018 19:30	16.5736389
5/7/2018 19:45	17.4172516
5/7/2018 20:00	18.2519894
5/7/2018 20:15	19.3662758
5/7/2018 20:30	14.9247761
5/7/2018 20:45	19.3662758
5/7/2018 21:00	17.2261963
5/7/2018 21:15	15.8433218
5/7/2018 21:30	15.1396065
5/7/2018 21:45	15.6484718
5/7/2018 22:00	15.6484718
5/7/2018 22:15	15.1396065
5/7/2018 22:30	14.6052408
5/7/2018 22:45	14.6052408
5/7/2018 23:00	13.9532223
5/7/2018 23:15	13.9532223
5/7/2018 23:30	13.9532223
5/7/2018 23:45	16.172781
5/8/2018 0:00	16.172781
5/8/2018 0:15	16.5141335
5/8/2018 0:30	16.0116329
5/8/2018 0:45	15.8272314
5/8/2018 1:00	15.2888613
5/8/2018 1:15	14.4498682
5/8/2018 1:30	14.1918354
5/8/2018 1:45	13.1462412
5/8/2018 2:00	14.1918354
5/8/2018 2:15	14.4498682
5/8/2018 2:30	14.1918354
5/8/2018 2:45	15.2368755
5/8/2018 3:00	17.4172516
5/8/2018 3:15	17.4172516
5/8/2018 3:30	13.6757669
5/8/2018 3:45	15.869051
5/8/2018 4:00	15.869051
5/8/2018 4:15	14.0628185
5/8/2018 4:30	15.869051
5/8/2018 4:45	16.3990116
5/8/2018 5:00	16.6046314
5/8/2018 5:15	16.6046314
5/8/2018 5:30	16.9679699
5/8/2018 5:45	16.9679699
5/8/2018 6:00	18.4144115
5/8/2018 6:15	18.4144115
5/8/2018 6:30	17.5609856
5/8/2018 6:45	24.5413246
5/8/2018 7:00	18.5034447
5/8/2018 7:15	18.5034447
5/8/2018 7:30	22.2436218
5/8/2018 7:45	22.7840691
5/8/2018 8:00	22.1442986
5/8/2018 8:15	22.1442986
5/8/2018 8:30	22.1442986
5/8/2018 8:45	22.1442986
5/8/2018 9:00	22.1079903
5/8/2018 9:15	22.4009132
5/8/2018 9:30	21.4526939
5/8/2018 9:45	20.7908382
5/8/2018 10:00	18.0664291
5/8/2018 10:15	18.0664291
5/8/2018 10:30	17.018671
5/8/2018 10:45	17.4548321
5/8/2018 11:00	16.9561768

Site 13 – MH 3.06 Flow Meter Data

5/8/2018 11:15	16.8566418
5/8/2018 11:30	17.0684166
5/8/2018 11:45	16.9381237
5/8/2018 12:00	16.4308949
5/8/2018 12:15	16.2270317
5/8/2018 12:30	16.7279663
5/8/2018 12:45	16.2542953
5/8/2018 13:00	16.4585018
5/8/2018 13:15	21.2152748
5/8/2018 13:30	22.9503822
5/8/2018 13:45	24.3533669
5/8/2018 14:00	24.646162
5/8/2018 14:15	24.3533669
5/8/2018 14:30	20.5763645
5/8/2018 14:45	17.0935764
5/8/2018 15:00	16.0123692
5/8/2018 15:15	16.0123692
5/8/2018 15:30	16.4118156
5/8/2018 15:45	21.5430374
5/8/2018 16:00	23.8793659
5/8/2018 16:15	25.8204479
5/8/2018 16:30	26.8735657
5/8/2018 16:45	30.0966263
5/8/2018 17:00	32.0786171
5/8/2018 17:15	30.0966263
5/8/2018 17:30	32.29533
5/8/2018 17:45	25.9055138
5/8/2018 18:00	23.0645027
5/8/2018 18:15	23.3252621
5/8/2018 18:30	23.5470047
5/8/2018 18:45	23.5470047
5/8/2018 19:00	23.5470047
5/8/2018 19:15	25.0138798
5/8/2018 19:30	23.2180748
5/8/2018 19:45	24.4913521
5/8/2018 20:00	24.0666161
5/8/2018 20:15	25.2838593
5/8/2018 20:30	23.7825623
5/8/2018 20:45	26.7312889
5/8/2018 21:00	25.4443607
5/8/2018 21:15	16.6196499
5/8/2018 21:30	16.6196499
5/8/2018 21:45	16.6196499
5/8/2018 22:00	16.3126621
5/8/2018 22:15	16.413065
5/8/2018 22:30	15.6437016
5/8/2018 22:45	15.6437016
5/8/2018 23:00	15.1437626
5/8/2018 23:15	16.3846397
5/8/2018 23:30	15.1437626
5/8/2018 23:45	14.5760975
5/9/2018 0:00	14.5760975
5/9/2018 0:15	15.7704592
5/9/2018 0:30	15.2776327
5/9/2018 0:45	17.0173244
5/9/2018 1:00	17.2374325
5/9/2018 1:15	15.4752388
5/9/2018 1:30	15.4752388
5/9/2018 1:45	14.1690998
5/9/2018 2:00	14.1690998
5/9/2018 2:15	13.4238997
5/9/2018 2:30	15.8054657
5/9/2018 2:45	14.4157124
5/9/2018 3:00	14.4157124
5/9/2018 3:15	14.6001205
5/9/2018 3:30	15.4861965
5/9/2018 3:45	15.5831032
5/9/2018 4:00	15.6824713
5/9/2018 4:15	15.6824713
5/9/2018 4:30	15.5831032
5/9/2018 4:45	15.0422983
5/9/2018 5:00	14.8540363
5/9/2018 5:15	14.4606924
5/9/2018 5:30	14.4606924
5/9/2018 5:45	16.6456718
5/9/2018 6:00	16.8566418
5/9/2018 6:15	17.0684166
5/9/2018 6:30	17.0684166
5/9/2018 6:45	16.1700878
5/9/2018 7:00	16.1304855
5/9/2018 7:15	15.3343716
5/9/2018 7:30	14.8271656
5/9/2018 7:45	15.1812935
5/9/2018 8:00	16.636694
5/9/2018 8:15	16.1140862
5/9/2018 8:30	16.4706135
5/9/2018 8:45	17.5119705
5/9/2018 9:00	18.0955124
5/9/2018 9:15	19.8922291
5/9/2018 9:30	22.3223381
5/9/2018 9:45	22.6129589
5/9/2018 10:00	26.3809452
5/9/2018 10:15	26.3809452
5/9/2018 10:30	21.7944641
5/9/2018 10:45	18.2238503
5/9/2018 11:00	17.8540154

Site 13 – MH 3.06 Flow Meter Data

5/9/2018 11:15	17.2117863
5/9/2018 11:30	17.2117863
5/9/2018 11:45	17.2117863
5/9/2018 12:00	18.8430843
5/9/2018 12:15	19.6889019
5/9/2018 12:30	19.4441643
5/9/2018 12:45	19.4441643
5/9/2018 13:00	17.8690891
5/9/2018 13:15	16.7977448
5/9/2018 13:30	16.587101
5/9/2018 13:45	16.9404812
5/9/2018 14:00	16.9548931
5/9/2018 14:15	16.9548931
5/9/2018 14:30	16.9548931
5/9/2018 14:45	16.9404812
5/9/2018 15:00	17.1682968
5/9/2018 15:15	17.1682968
5/9/2018 15:30	22.1418171
5/9/2018 15:45	23.4344654
5/9/2018 16:00	23.4344654
5/9/2018 16:15	23.4344654
5/9/2018 16:30	19.2505474
5/9/2018 16:45	17.9643936
5/9/2018 17:00	15.7007675
5/9/2018 17:15	15.7007675
5/9/2018 17:30	18.4863873
5/9/2018 17:45	18.4863873
5/9/2018 18:00	18.4863873
5/9/2018 18:15	20.5049171
5/9/2018 18:30	20.5049171
5/9/2018 18:45	18.3075829
5/9/2018 19:00	18.0787373
5/9/2018 19:15	16.1455898
5/9/2018 19:30	15.7619143
5/9/2018 19:45	15.9534225
5/9/2018 20:00	14.6023884
5/9/2018 20:15	17.4981232
5/9/2018 20:30	16.6551304
5/9/2018 20:45	16.4462757
5/9/2018 21:00	16.4462757
5/9/2018 21:15	16.4462757
5/9/2018 21:30	16.3338623
5/9/2018 21:45	16.587101
5/9/2018 22:00	19.7574196
5/9/2018 22:15	16.3338623
5/9/2018 22:30	16.3338623
5/9/2018 22:45	16.2211361
5/9/2018 23:00	16.0158691
5/9/2018 23:15	14.739253
5/9/2018 23:30	14.739253
5/9/2018 23:45	14.1147099
5/10/2018 0:00	14.5019512
5/10/2018 0:15	14.5019512
5/10/2018 0:30	14.5019512
5/10/2018 0:45	15.8634348
5/10/2018 1:00	17.2224426
5/10/2018 1:15	17.0025272
5/10/2018 1:30	17.0025272
5/10/2018 1:45	14.4277306
5/10/2018 2:00	14.601635
5/10/2018 2:15	14.2396183
5/10/2018 2:30	14.2396183
5/10/2018 2:45	14.1147099
5/10/2018 3:00	14.2396183
5/10/2018 3:15	14.8641634
5/10/2018 3:30	16.2521858
5/10/2018 3:45	14.8641634
5/10/2018 4:00	16.2521858
5/10/2018 4:15	14.6743603
5/10/2018 4:30	14.415184
5/10/2018 4:45	14.415184
5/10/2018 5:00	16.2229595
5/10/2018 5:15	14.7887764
5/10/2018 5:30	16.643404
5/10/2018 5:45	17.536684
5/10/2018 6:00	17.536684
5/10/2018 6:15	17.3167725
5/10/2018 6:30	17.536684
5/10/2018 6:45	18.3521862
5/10/2018 7:00	19.4905128
5/10/2018 7:15	18.640419
5/10/2018 7:30	19.7358341
5/10/2018 7:45	19.4905128
5/10/2018 8:00	19.3412933
5/10/2018 8:15	19.4965439
5/10/2018 8:30	19.4965439
5/10/2018 8:45	18.1091614
5/10/2018 9:00	17.9486752
5/10/2018 9:15	17.7255688
5/10/2018 9:30	17.4734344
5/10/2018 9:45	15.8273859
5/10/2018 10:00	17.4734344
5/10/2018 10:15	17.9671745
5/10/2018 10:30	17.9671745
5/10/2018 10:45	17.9671745
5/10/2018 11:00	17.9671745

Site 13 – MH 3.06 Flow Meter Data

5/10/2018 11:15	15.7007675
5/10/2018 11:30	15.6614943
5/10/2018 11:45	15.6614943
5/10/2018 12:00	15.406271
5/10/2018 12:15	16.1639557
5/10/2018 12:30	18.2765713
5/10/2018 12:45	18.2765713
5/10/2018 13:00	17.2528801
5/10/2018 13:15	17.2528801
5/10/2018 13:30	17.2528801
5/10/2018 13:45	16.8956795
5/10/2018 14:00	16.2695446
5/10/2018 14:15	14.1276703
5/10/2018 14:30	15.4105558
5/10/2018 14:45	15.4105558
5/10/2018 15:00	15.2564297
5/10/2018 15:15	16.3338203
5/10/2018 15:30	16.1842155
5/10/2018 15:45	19.0211353
5/10/2018 16:00	20.7905903
5/10/2018 16:15	21.1237812
5/10/2018 16:30	21.651741
5/10/2018 16:45	25.6202965
5/10/2018 17:00	21.6930523
5/10/2018 17:15	21.6930523
5/10/2018 17:30	24.3925743
5/10/2018 17:45	21.1640854
5/10/2018 18:00	21.1640854
5/10/2018 18:15	20.4112301
5/10/2018 18:30	20.0330734
5/10/2018 18:45	18.9743805
5/10/2018 19:00	18.9743805
5/10/2018 19:15	17.1221485
5/10/2018 19:30	15.3340425
5/10/2018 19:45	15.0933199
5/10/2018 20:00	15.0933199
5/10/2018 20:15	15.0933199
5/10/2018 20:30	15.4004374
5/10/2018 20:45	15.4004374
5/10/2018 21:00	14.8231506
5/10/2018 21:15	14.6615992
5/10/2018 21:30	14.8512373
5/10/2018 21:45	14.2519178
5/10/2018 22:00	14.8512373
5/10/2018 22:15	15.5676413
5/10/2018 22:30	15.5676413
5/10/2018 22:45	16.3630695
5/10/2018 23:00	18.2048817
5/10/2018 23:15	16.5022202
5/10/2018 23:30	16.5022202
5/10/2018 23:45	16.5022202
5/11/2018 0:00	16.2915001
5/11/2018 0:15	16.2915001
5/11/2018 0:30	16.5097008
5/11/2018 0:45	15.2909288
5/11/2018 1:00	16.1259365
5/11/2018 1:15	16.1259365
5/11/2018 1:30	16.1259365
5/11/2018 1:45	18.3616123
5/11/2018 2:00	18.92976
5/11/2018 2:15	18.3616123
5/11/2018 2:30	18.2058353
5/11/2018 2:45	19.0188446
5/11/2018 3:00	18.7759895
5/11/2018 3:15	15.5240459
5/11/2018 3:30	18.850626
5/11/2018 3:45	17.5257053
5/11/2018 4:15	15.4887075
5/11/2018 5:00	15.3637981
5/11/2018 5:15	16.4879799
5/11/2018 6:15	16.632906
5/11/2018 6:45	22.5857811
5/11/2018 7:30	15.5741863
5/11/2018 7:45	16.4577503
5/11/2018 8:00	16.4577503
5/11/2018 8:15	17.8138161
5/11/2018 8:30	17.1909561
5/11/2018 8:45	0
5/11/2018 9:45	0
5/11/2018 10:15	0
5/11/2018 10:30	0
5/11/2018 10:45	0
5/11/2018 11:00	0
5/11/2018 11:30	0
5/11/2018 12:00	0
5/11/2018 12:30	0

Site 14 – MH 13.03 Flow Meter Data

Inst Time	Flow (gpm)
4/24/2018 14:45	6.02408266
4/24/2018 15:00	6.17653322
4/24/2018 15:15	6.02408266
4/24/2018 15:30	5.9270587
4/24/2018 15:45	6.02408266
4/24/2018 16:00	5.97389746
4/24/2018 16:15	5.94005537
4/24/2018 16:30	6.27157164
4/24/2018 16:45	6.25000668
4/24/2018 17:00	6.31478405
4/24/2018 17:15	6.45186853
4/24/2018 17:30	6.39716339
4/24/2018 17:45	6.45186853
4/24/2018 18:00	7.17899466
4/24/2018 18:15	8.21504307
4/24/2018 18:30	8.21504307
4/24/2018 18:45	8.82433033
4/24/2018 19:00	8.82433033
4/24/2018 19:15	9.06440067
4/24/2018 19:30	9.42487621
4/24/2018 19:45	9.56611633
4/24/2018 20:00	9.42487621
4/24/2018 20:15	9.42487621
4/24/2018 20:30	7.59603024
4/24/2018 20:45	7.59603024
4/24/2018 21:00	9.34390926
4/24/2018 21:15	7.98226929
4/24/2018 21:30	7.98226929
4/24/2018 21:45	8.00084877
4/24/2018 22:00	8.41133308
4/24/2018 22:15	8.5954113
4/24/2018 22:30	7.94685459
4/24/2018 22:45	7.0574317
4/24/2018 23:00	6.69146299
4/24/2018 23:15	6.51561451
4/24/2018 23:30	5.75968742
4/24/2018 23:45	5.75433064
4/25/2018 0:00	6.17243385
4/25/2018 0:15	6.17243385
4/25/2018 0:30	6.17243385
4/25/2018 0:45	6.17243385
4/25/2018 1:00	6.26407814
4/25/2018 1:15	6.26407814
4/25/2018 1:30	6.26407814
4/25/2018 1:45	6.26407814
4/25/2018 2:00	5.64705133
4/25/2018 2:15	0
4/25/2018 2:30	3.09475255
4/25/2018 2:45	6.1895051
4/25/2018 3:00	4.72440147
4/25/2018 3:15	6.28122854
4/25/2018 3:30	6.28122854
4/25/2018 3:45	6.28122854
4/25/2018 4:00	0
4/25/2018 4:15	3.47710872
4/25/2018 4:30	6.95421743
4/25/2018 4:45	5.45796633
4/25/2018 5:00	7.02611256
4/25/2018 5:15	7.7704587
4/25/2018 5:30	7.7704587
4/25/2018 5:45	7.7704587
4/25/2018 6:00	7.67153883
4/25/2018 6:15	7.53555775
4/25/2018 6:30	7.06120539
4/25/2018 6:45	6.27653313
4/25/2018 7:00	6.27653313
4/25/2018 7:15	6.27653313
4/25/2018 7:30	6.21242285
4/25/2018 7:45	5.84849215
4/25/2018 8:00	5.84849215
4/25/2018 8:15	5.84849215
4/25/2018 8:30	5.45200825
4/25/2018 8:45	5.14077377
4/25/2018 9:00	5.39935064
4/25/2018 9:15	5.72624016
4/25/2018 9:30	8.56404972
4/25/2018 9:45	9.01155853
4/25/2018 10:00	9.40138531
4/25/2018 10:15	9.40138531
4/25/2018 10:30	8.89297104
4/25/2018 10:45	8.42322159
4/25/2018 11:00	7.62155676
4/25/2018 11:15	7.62155676
4/25/2018 11:30	7.96184826
4/25/2018 11:45	8.53671265
4/25/2018 12:00	9.11101627
4/25/2018 12:15	8.88401604
4/25/2018 12:30	6.75863695
4/25/2018 12:45	6.7191267
4/25/2018 13:00	6.80641651
4/25/2018 13:15	6.81236029
4/25/2018 13:30	6.03804159
4/25/2018 13:45	7.50184774
4/25/2018 14:00	7.50184774
4/25/2018 14:15	7.39808083

Site 14 – MH 13.03 Flow Meter Data

4/25/2018 14:30	5.37934637
4/25/2018 14:45	5.18321991
4/25/2018 15:00	5.18321991
4/25/2018 15:15	5.16953373
4/25/2018 15:30	5.70603418
4/25/2018 15:45	5.78702116
4/25/2018 16:00	8.28560925
4/25/2018 16:15	8.28560925
4/25/2018 16:30	9.28425884
4/25/2018 16:45	9.28425884
4/25/2018 17:00	9.28425884
4/25/2018 17:15	9.59787655
4/25/2018 17:30	9.48747921
4/25/2018 17:45	7.9172821
4/25/2018 18:00	8.02226543
4/25/2018 18:15	8.02226543
4/25/2018 18:30	8.411623
4/25/2018 18:45	8.411623
4/25/2018 19:00	8.411623
4/25/2018 19:15	7.40996742
4/25/2018 19:30	7.40996742
4/25/2018 19:45	7.40996742
4/25/2018 20:00	7.48695517
4/25/2018 20:15	8.23994064
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4/25/2018 20:45	7.19483232
4/25/2018 21:00	6.85301876
4/25/2018 21:15	7.19483232
4/25/2018 21:30	6.9075222
4/25/2018 21:45	7.2228694
4/25/2018 22:00	8.07982063
4/25/2018 22:15	7.35996151
4/25/2018 22:30	7.23502207
4/25/2018 22:45	6.9281683
4/25/2018 23:00	7.03642035
4/25/2018 23:15	7.03642035
4/25/2018 23:30	7.93423843
4/25/2018 23:45	7.93423843
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4/26/2018 0:15	6.81352472
4/26/2018 0:30	6.61752224
4/26/2018 0:45	6.51150656
4/26/2018 1:00	6.30145836
4/26/2018 1:15	6.30145836
4/26/2018 1:30	6.30145836
4/26/2018 1:45	6.30145836
4/26/2018 2:00	6.4064827
4/26/2018 2:15	6.51150656
4/26/2018 2:30	6.51150656
4/26/2018 2:45	6.84355402
4/26/2018 3:00	6.84355402
4/26/2018 3:15	6.89204264
4/26/2018 3:30	6.89204264
4/26/2018 3:45	6.89204264
4/26/2018 4:00	6.89204264
4/26/2018 4:15	6.89204264
4/26/2018 4:30	6.72425604
4/26/2018 4:45	6.72425604
4/26/2018 5:00	6.71795559
4/26/2018 5:15	6.61132145
4/26/2018 5:30	6.61132145
4/26/2018 5:45	6.71795559
4/26/2018 6:00	6.9519372
4/26/2018 6:15	7.59897041
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4/26/2018 6:45	7.29661131
4/26/2018 7:00	7.27080536
4/26/2018 7:15	7.29661131
4/26/2018 7:30	7.29661131
4/26/2018 7:45	8.38939095
4/26/2018 8:00	8.38939095
4/26/2018 8:15	9.49311829
4/26/2018 8:30	9.22867203
4/26/2018 8:45	9.22867203
4/26/2018 9:00	8.61310768
4/26/2018 9:15	8.69896984
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4/26/2018 9:45	8.22778511
4/26/2018 10:00	7.73161936
4/26/2018 10:15	7.53543282
4/26/2018 10:30	7.53543282
4/26/2018 10:45	7.53543282
4/26/2018 11:00	7.62988758
4/26/2018 11:15	7.62988758
4/26/2018 11:30	8.45156479
4/26/2018 11:45	8.51863003
4/26/2018 12:00	7.81803846
4/26/2018 12:15	8.49628258
4/26/2018 12:30	8.49628258
4/26/2018 12:45	7.93294621
4/26/2018 13:00	7.72391987
4/26/2018 13:15	7.83744431
4/26/2018 13:30	7.83744431
4/26/2018 13:45	7.85431385
4/26/2018 14:00	8.57096386
4/26/2018 14:15	9.00793648

Site 14 – MH 13.03 Flow Meter Data

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4/26/2018 14:45	7.36950159
4/26/2018 15:00	6.66303015
4/26/2018 15:15	7.30667734
4/26/2018 15:30	7.59765244
4/26/2018 15:45	7.65568924
4/26/2018 16:00	7.65568924
4/26/2018 16:15	8.06595802
4/26/2018 16:30	7.82082891
4/26/2018 16:45	7.22289515
4/26/2018 17:00	7.16813946
4/26/2018 17:15	7.60102415
4/26/2018 17:30	7.60102415
4/26/2018 17:45	7.72741508
4/26/2018 18:00	8.60909176
4/26/2018 18:15	8.54745483
4/26/2018 18:30	8.54745483
4/26/2018 18:45	7.79517698
4/26/2018 19:00	8.76140881
4/26/2018 19:15	8.05026054
4/26/2018 19:30	8.26590538
4/26/2018 19:45	7.42261934
4/26/2018 20:00	7.36644793
4/26/2018 20:15	7.46660757
4/26/2018 20:30	7.80969715
4/26/2018 20:45	7.80969715
4/26/2018 21:00	8.07755375
4/26/2018 21:15	7.76214123
4/26/2018 21:30	7.06737804
4/26/2018 21:45	7.06737804
4/26/2018 22:00	6.97147465
4/26/2018 22:15	6.97147465
4/26/2018 22:30	7.7842927
4/26/2018 22:45	7.56502581
4/26/2018 23:00	7.54089165
4/26/2018 23:15	7.54822683
4/26/2018 23:30	7.64886999
4/26/2018 23:45	7.43706608
4/27/2018 0:00	7.42983913
4/27/2018 0:15	7.42983913
4/27/2018 0:30	7.42983913
4/27/2018 0:45	7.45059013
4/27/2018 1:00	7.45059013
4/27/2018 1:15	7.45195007
4/27/2018 1:30	7.45195007
4/27/2018 1:45	7.55130911
4/27/2018 2:00	7.55130911
4/27/2018 2:15	7.55130911
4/27/2018 2:30	7.55130911
4/27/2018 2:45	7.55130911
4/27/2018 3:00	7.45195007
4/27/2018 3:15	7.25323153
4/27/2018 3:30	7.1677227
4/27/2018 3:45	6.76299715
4/27/2018 4:00	6.86387396
4/27/2018 4:15	6.96517992
4/27/2018 4:30	6.96517992
4/27/2018 4:45	5.75354147
4/27/2018 5:00	5.64711714
4/27/2018 5:15	5.64711714
4/27/2018 5:30	5.75354147
4/27/2018 5:45	5.64711714
4/27/2018 6:00	6.05635977
4/27/2018 6:15	6.56105566
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4/27/2018 6:45	6.05635977
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4/27/2018 7:30	6.25823784
4/27/2018 7:45	6.25823784
4/27/2018 8:00	6.02766037
4/27/2018 8:15	5.3314476
4/27/2018 8:30	5.1505909
4/27/2018 8:45	5.5299511
4/27/2018 9:00	5.3314476
4/27/2018 9:15	5.67509174
4/27/2018 9:30	6.33201361
4/27/2018 9:45	6.33201361
4/27/2018 10:00	5.49501038
4/27/2018 10:15	5.413239
4/27/2018 10:30	5.17531109
4/27/2018 10:45	5.17531109
4/27/2018 11:00	6.79743862
4/27/2018 11:15	6.69521523
4/27/2018 11:30	6.52570677
4/27/2018 11:45	6.52570677
4/27/2018 12:00	6.52570677
4/27/2018 12:15	6.42637444
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4/27/2018 12:45	6.72410393
4/27/2018 13:00	6.72410393
4/27/2018 13:15	6.81511021
4/27/2018 13:30	6.81511021
4/27/2018 13:45	6.51249838
4/27/2018 14:00	6.41435623
4/27/2018 14:15	6.10358191

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4/27/2018 14:45	5.88793468
4/27/2018 15:00	6.16000414
4/27/2018 15:15	6.16000414
4/27/2018 15:30	6.88321114
4/27/2018 15:45	6.78141928
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4/27/2018 16:15	6.68007803
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4/27/2018 17:00	7.16724777
4/27/2018 17:15	6.10524321
4/27/2018 17:30	5.89358044
4/27/2018 17:45	5.14378023
4/27/2018 18:00	5.14378023
4/27/2018 18:15	5.6437788
4/27/2018 18:30	6.1404109
4/27/2018 18:45	5.88014746
4/27/2018 19:00	5.88014746
4/27/2018 19:15	6.15786457
4/27/2018 19:30	6.49287748
4/27/2018 19:45	6.49287748
4/27/2018 20:00	6.59626484
4/27/2018 20:15	6.88651514
4/27/2018 20:30	7.28309155
4/27/2018 20:45	7.49371576
4/27/2018 21:00	8.48809147
4/27/2018 21:15	8.69517517
4/27/2018 21:30	9.02183723
4/27/2018 21:45	9.02183723
4/27/2018 22:00	9.02183723
4/27/2018 22:15	8.88508415
4/27/2018 22:30	8.6625948
4/27/2018 22:45	8.53686428
4/27/2018 23:00	8.63031101
4/27/2018 23:15	8.71512222
4/27/2018 23:30	8.95491982
4/27/2018 23:45	9.21656322
4/28/2018 0:00	9.24107838
4/28/2018 0:15	9.31035709
4/28/2018 0:30	9.32333183
4/28/2018 0:45	9.06844521
4/28/2018 1:00	9.32333183
4/28/2018 1:15	9.32333183
4/28/2018 1:30	9.15070534
4/28/2018 1:45	9.15070534
4/28/2018 2:00	9.15070534
4/28/2018 2:15	8.92408752
4/28/2018 2:30	8.5124445
4/28/2018 2:45	7.31958437
4/28/2018 3:00	5.52482605
4/28/2018 3:15	4.99274111
4/28/2018 3:30	4.99274111
4/28/2018 3:45	5.15916586
4/28/2018 4:00	5.15916586
4/28/2018 4:15	5.15916586
4/28/2018 4:30	5.15916586
4/28/2018 4:45	5.15916586
4/28/2018 5:00	5.15916586
4/28/2018 5:15	5.23682737
4/28/2018 5:30	5.24237823
4/28/2018 5:45	5.24237823
4/28/2018 6:00	5.98821545
4/28/2018 6:15	6.18213844
4/28/2018 6:30	6.62332964
4/28/2018 6:45	6.83372355
4/28/2018 7:00	7.71077442
4/28/2018 7:15	8.17675209
4/28/2018 7:30	9.35330009
4/28/2018 7:45	9.23975754
4/28/2018 8:00	9.59087944
4/28/2018 8:15	10.0698576
4/28/2018 8:30	10.8086061
4/28/2018 8:45	13.0946369
4/28/2018 9:00	14.1137877
4/28/2018 9:15	15.6057568
4/28/2018 9:30	16.2603168
4/28/2018 9:45	15.2541838
4/28/2018 10:00	15.7578392
4/28/2018 10:15	17.1798306
4/28/2018 10:30	17.9654636
4/28/2018 10:45	17.838459
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4/28/2018 11:30	18.9118042
4/28/2018 11:45	19.5984764
4/28/2018 12:00	21.0677624
4/28/2018 12:15	22.0542431
4/28/2018 12:30	22.0542431
4/28/2018 12:45	21.5527897
4/28/2018 13:00	21.7542782
4/28/2018 13:15	20.8843689
4/28/2018 13:30	19.6678715
4/28/2018 13:45	19.4752884
4/28/2018 14:00	19.5497894
4/28/2018 14:15	19.5497894

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4/28/2018 14:45	21.9085197
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4/28/2018 15:15	26.3868694
4/28/2018 15:30	27.8210812
4/28/2018 15:45	26.4744453
4/28/2018 16:00	26.3475494
4/28/2018 16:15	26.0808258
4/28/2018 16:30	26.4633198
4/28/2018 16:45	26.3521252
4/28/2018 17:00	25.2401638
4/28/2018 17:15	24.5790405
4/28/2018 17:30	24.3987942
4/28/2018 17:45	21.0944748
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4/28/2018 18:15	19.3784466
4/28/2018 18:30	18.6266422
4/28/2018 18:45	18.2537956
4/28/2018 19:00	17.6984673
4/28/2018 19:15	17.1679707
4/28/2018 19:30	16.0194244
4/28/2018 19:45	15.9250393
4/28/2018 20:00	14.757803
4/28/2018 20:15	14.757803
4/28/2018 20:30	13.4833336
4/28/2018 20:45	12.7076035
4/28/2018 21:00	11.6198044
4/28/2018 21:15	11.4780045
4/28/2018 21:30	9.50705433
4/28/2018 21:45	9.77932072
4/28/2018 22:00	9.62450504
4/28/2018 22:15	9.50705433
4/28/2018 22:30	9.62450504
4/28/2018 22:45	10.0437164
4/28/2018 23:00	9.51015377
4/28/2018 23:15	9.69858742
4/28/2018 23:30	9.69858742
4/28/2018 23:45	7.82423449
4/29/2018 0:00	7.63058186
4/29/2018 0:15	7.4023242
4/29/2018 0:30	7.4023242
4/29/2018 0:45	8.31152344
4/29/2018 1:00	8.42820072
4/29/2018 1:15	8.29178619
4/29/2018 1:30	8.18522167
4/29/2018 1:45	7.48238516
4/29/2018 2:00	7.25907564
4/29/2018 2:15	6.88428068
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4/29/2018 2:45	6.44471455
4/29/2018 3:00	6.26676178
4/29/2018 3:15	6.22058392
4/29/2018 3:30	5.84798145
4/29/2018 3:45	5.67995358
4/29/2018 4:00	5.87169361
4/29/2018 4:15	5.76209784
4/29/2018 4:30	5.50112009
4/29/2018 4:45	5.60962057
4/29/2018 5:00	5.32914829
4/29/2018 5:15	5.4658885
4/29/2018 5:30	5.13571501
4/29/2018 5:45	6.4561491
4/29/2018 6:00	5.37833929
4/29/2018 6:15	6.4561491
4/29/2018 6:30	5.45343781
4/29/2018 6:45	8.38647938
4/29/2018 7:00	6.07655621
4/29/2018 7:15	6.16718578
4/29/2018 7:30	6.11459017
4/29/2018 7:45	7.29618168
4/29/2018 8:00	6.4023962
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4/29/2018 9:30	6.23192501
4/29/2018 9:45	6.74770355
4/29/2018 10:00	6.74770355
4/29/2018 10:15	6.15151787
4/29/2018 10:30	6.33981371
4/29/2018 10:45	6.33981371
4/29/2018 11:00	5.65834761
4/29/2018 11:15	4.87412977
4/29/2018 11:30	4.69513607
4/29/2018 11:45	4.69513607
4/29/2018 12:00	5.65834761
4/29/2018 12:15	4.54337215
4/29/2018 12:30	5.71669769
4/29/2018 12:45	6.2342658
4/29/2018 13:00	6.49254847
4/29/2018 13:15	6.84162283
4/29/2018 13:30	7.10686493
4/29/2018 13:45	7.4869318
4/29/2018 14:00	8.22439575
4/29/2018 14:15	7.37622833

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4/29/2018 14:45	7.46902561
4/29/2018 15:00	7.46902561
4/29/2018 15:15	6.59701538
4/29/2018 15:30	6.59701538
4/29/2018 15:45	6.59701538
4/29/2018 16:00	5.95110941
4/29/2018 16:15	5.95110941
4/29/2018 16:30	6.69993114
4/29/2018 16:45	6.69993114
4/29/2018 17:00	5.28174782
4/29/2018 17:15	5.23053646
4/29/2018 17:30	5.28434992
4/29/2018 17:45	5.32691526
4/29/2018 18:00	6.00822973
4/29/2018 18:15	5.91013098
4/29/2018 18:30	6.36169672
4/29/2018 18:45	6.53088427
4/29/2018 19:00	6.36169672
4/29/2018 19:15	5.18248987
4/29/2018 19:30	5.27069807
4/29/2018 19:45	5.27069807
4/29/2018 20:00	5.1578145
4/29/2018 20:15	5.230896
4/29/2018 20:30	6.84056234
4/29/2018 20:45	6.84056234
4/29/2018 21:00	6.94694281
4/29/2018 21:15	6.73895788
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4/29/2018 21:45	5.83306932
4/29/2018 22:00	6.03191423
4/29/2018 22:15	6.03191423
4/29/2018 22:30	6.03773785
4/29/2018 22:45	6.14595699
4/29/2018 23:00	6.23592472
4/29/2018 23:15	6.66824579
4/29/2018 23:30	6.63887453
4/29/2018 23:45	6.63887453
4/30/2018 0:00	6.12612152
4/30/2018 0:15	6.03773785
4/30/2018 0:30	5.94974279
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4/30/2018 1:15	6.56653738
4/30/2018 1:30	6.56653738
4/30/2018 1:45	6.56772423
4/30/2018 2:00	6.56772423
4/30/2018 2:15	6.56772423
4/30/2018 2:30	6.56772423
4/30/2018 2:45	6.56772423
4/30/2018 3:00	6.56772423
4/30/2018 3:15	6.56772423
4/30/2018 3:30	6.97189236
4/30/2018 3:45	7.07293463
4/30/2018 4:00	7.07293463
4/30/2018 4:15	8.35467815
4/30/2018 4:30	8.35467815
4/30/2018 4:45	8.35467815
4/30/2018 5:00	8.47928524
4/30/2018 5:15	6.71902943
4/30/2018 5:30	6.25979519
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4/30/2018 6:00	6.67077923
4/30/2018 6:15	6.60484457
4/30/2018 6:30	6.25979519
4/30/2018 6:45	6.15546465
4/30/2018 7:00	6.24447155
4/30/2018 7:15	5.92695665
4/30/2018 7:30	5.92695665
4/30/2018 7:45	5.97860193
4/30/2018 8:00	5.17281485
4/30/2018 8:15	5.01165533
4/30/2018 8:30	7.3176713
4/30/2018 8:45	5.07227373
4/30/2018 9:00	5.38783264
4/30/2018 9:15	5.07613039
4/30/2018 9:30	5.60178423
4/30/2018 9:45	5.60178423
4/30/2018 10:00	5.92532873
4/30/2018 10:15	5.98279333
4/30/2018 10:30	8.42946339
4/30/2018 10:45	8.42946339
4/30/2018 11:00	8.42946339
4/30/2018 11:15	8.42857933
4/30/2018 11:30	6.40177202
4/30/2018 11:45	5.31646681
4/30/2018 12:00	5.22637796
4/30/2018 12:15	5.22637796
4/30/2018 12:30	5.20147991
4/30/2018 12:45	5.14795065
4/30/2018 13:00	5.14795065
4/30/2018 13:15	5.18667793
4/30/2018 13:30	5.18667793
4/30/2018 13:45	6.13182974
4/30/2018 14:00	7.65795708
4/30/2018 14:15	7.6664772

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4/30/2018 14:45	7.6664772
4/30/2018 15:00	7.77615023
4/30/2018 15:15	7.85889626
4/30/2018 15:30	7.87460566
4/30/2018 15:45	7.87460566
4/30/2018 16:00	7.78480148
4/30/2018 16:15	7.78480148
4/30/2018 16:30	6.60606098
4/30/2018 16:45	6.60606098
4/30/2018 17:00	6.53057241
4/30/2018 17:15	6.49896383
4/30/2018 17:30	6.43110228
4/30/2018 17:45	6.53057241
4/30/2018 18:00	4.64077473
4/30/2018 18:15	4.85429335
4/30/2018 18:30	4.85429335
4/30/2018 18:45	4.93654585
4/30/2018 19:00	5.8189187
4/30/2018 19:15	5.8189187
4/30/2018 19:30	5.8189187
4/30/2018 19:45	5.35169315
4/30/2018 20:00	5.13666868
4/30/2018 20:15	5.08044577
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4/30/2018 21:15	5.23426151
4/30/2018 21:30	5.23426151
4/30/2018 21:45	5.23426151
4/30/2018 22:00	7.52570057
4/30/2018 22:15	7.59492779
4/30/2018 22:30	7.47948933
4/30/2018 22:45	7.47948933
4/30/2018 23:00	0
4/30/2018 23:15	2.67341471
4/30/2018 23:30	5.14543915
4/30/2018 23:45	4.73991919
5/1/2018 0:00	5.49670649
5/1/2018 0:15	7.97873926
5/1/2018 0:30	7.95904589
5/1/2018 0:45	7.91178131
5/1/2018 1:00	7.83781815
5/1/2018 1:15	7.73950148
5/1/2018 1:30	7.73950148
5/1/2018 1:45	7.73950148
5/1/2018 2:00	7.73950148
5/1/2018 2:15	7.73950148
5/1/2018 2:30	7.73950148
5/1/2018 2:45	7.5382123
5/1/2018 3:00	0
5/1/2018 3:15	0
5/1/2018 3:30	0
5/1/2018 3:45	0
5/1/2018 4:00	4.91180801
5/1/2018 4:15	5.24656582
5/1/2018 4:30	5.13643503
5/1/2018 4:45	5.13643503
5/1/2018 5:00	0
5/1/2018 5:15	0
5/1/2018 5:30	0
5/1/2018 5:45	0
5/1/2018 6:00	3.91337681
5/1/2018 6:15	7.73469067
5/1/2018 6:30	5.86832571
5/1/2018 6:45	7.95161247
5/1/2018 7:00	7.95161247
5/1/2018 7:15	7.95161247
5/1/2018 7:30	0
5/1/2018 7:45	0
5/1/2018 8:00	2.2311399
5/1/2018 8:15	4.32837009
5/1/2018 8:30	3.41573715
5/1/2018 8:45	4.50544834
5/1/2018 9:00	4.60033369
5/1/2018 9:15	4.60033369
5/1/2018 9:30	8.00911522
5/1/2018 9:45	8.00911522
5/1/2018 10:00	8.00911522
5/1/2018 10:15	7.91942167
5/1/2018 10:30	7.80754519
5/1/2018 10:45	7.56599808
5/1/2018 11:00	7.56599808
5/1/2018 11:15	6.52923298
5/1/2018 11:30	6.29143
5/1/2018 11:45	5.85388708
5/1/2018 12:00	6.52923298
5/1/2018 12:15	6.11530066
5/1/2018 12:30	6.11530066
5/1/2018 12:45	8.46908188
5/1/2018 13:00	8.46908188
5/1/2018 13:15	8.22223854
5/1/2018 13:30	7.85604763
5/1/2018 13:45	7.28587627
5/1/2018 14:00	7.16994238
5/1/2018 14:15	7.16994238

Site 14 – MH 13.03 Flow Meter Data

5/1/2018 14:30	7.03022861
5/1/2018 14:45	7.03022861
5/1/2018 15:00	7.03022861
5/1/2018 15:15	0
5/1/2018 15:30	2.83380413
5/1/2018 15:45	5.23389959
5/1/2018 16:00	4.03954554
5/1/2018 16:15	4.78568077
5/1/2018 16:30	5.66760826
5/1/2018 16:45	4.78568077
5/1/2018 17:00	5.21741533
5/1/2018 17:15	6.10578012
5/1/2018 17:30	6.19843292
5/1/2018 17:45	6.51395035
5/1/2018 18:00	8.64331627
5/1/2018 18:15	9.02145767
5/1/2018 18:30	6.60874224
5/1/2018 18:45	8.79479885
5/1/2018 19:00	9.31829929
5/1/2018 19:15	9.01285744
5/1/2018 19:30	8.66865158
5/1/2018 19:45	8.66865158
5/1/2018 20:00	8.57368946
5/1/2018 20:15	8.35737991
5/1/2018 20:30	7.66545105
5/1/2018 20:45	7.42311144
5/1/2018 21:00	7.36172295
5/1/2018 21:15	6.48678017
5/1/2018 21:30	7.89198542
5/1/2018 21:45	7.89198542
5/1/2018 22:00	8.48486042
5/1/2018 22:15	8.48486042
5/1/2018 22:30	8.56785774
5/1/2018 22:45	8.56785774
5/1/2018 23:00	8.72092724
5/1/2018 23:15	8.72092724
5/1/2018 23:30	8.72092724
5/1/2018 23:45	7.55605888
5/2/2018 0:00	7.33760738
5/2/2018 0:15	7.33760738
5/2/2018 0:30	7.33760738
5/2/2018 0:45	7.33760738
5/2/2018 1:00	7.33760738
5/2/2018 1:15	0
5/2/2018 1:30	0
5/2/2018 1:45	0
5/2/2018 2:00	0
5/2/2018 2:15	0
5/2/2018 2:30	0
5/2/2018 2:45	0
5/2/2018 3:00	0
5/2/2018 3:15	0
5/2/2018 3:30	0
5/2/2018 3:45	0
5/2/2018 4:00	0
5/2/2018 4:15	0
5/2/2018 4:30	0
5/2/2018 4:45	0
5/2/2018 5:00	0
5/2/2018 5:15	0
5/2/2018 5:30	0
5/2/2018 5:45	0
5/2/2018 6:00	0
5/2/2018 6:15	2.23286724
5/2/2018 6:30	4.23188782
5/2/2018 6:45	4.63984871
5/2/2018 7:00	4.6995821
5/2/2018 7:15	4.74348068
5/2/2018 7:30	4.75328541
5/2/2018 7:45	4.74348068
5/2/2018 8:00	4.89941454
5/2/2018 8:15	5.10865498
5/2/2018 8:30	4.75870943
5/2/2018 8:45	4.75870943
5/2/2018 9:00	4.68279457
5/2/2018 9:15	4.73508787
5/2/2018 9:30	4.68279457
5/2/2018 9:45	4.68279457
5/2/2018 10:00	4.55637217
5/2/2018 10:15	4.60725355
5/2/2018 10:30	4.60725355
5/2/2018 10:45	6.46838284
5/2/2018 11:00	7.23333788
5/2/2018 11:15	7.24887609
5/2/2018 11:30	9.10820007
5/2/2018 11:45	9.21936035
5/2/2018 12:00	9.21936035
5/2/2018 12:15	8.43363476
5/2/2018 12:30	9.08270741
5/2/2018 12:45	7.83233213
5/2/2018 13:00	7.27848101
5/2/2018 13:15	0
5/2/2018 13:30	0
5/2/2018 13:45	0
5/2/2018 14:00	6.09504271
5/2/2018 14:15	6.09504271

Site 14 – MH 13.03 Flow Meter Data

5/2/2018 14:30	6.00469971
5/2/2018 14:45	5.88381767
5/2/2018 15:00	5.45772123
5/2/2018 15:15	4.86133432
5/2/2018 15:30	3.80440831
5/2/2018 15:45	3.78447437
5/2/2018 16:00	3.70648861
5/2/2018 16:15	3.58386874
5/2/2018 16:30	0
5/2/2018 16:45	0
5/2/2018 17:00	0
5/2/2018 17:15	0
5/2/2018 17:30	0
5/2/2018 17:45	2.90821481
5/2/2018 18:00	4.28678083
5/2/2018 18:15	3.54892802
5/2/2018 18:30	4.33121204
5/2/2018 18:45	4.28678083
5/2/2018 19:00	4.14105988
5/2/2018 19:15	4.08451462
5/2/2018 19:30	4.14105988
5/2/2018 19:45	4.14105988
5/2/2018 20:00	4.66149998
5/2/2018 20:15	6.50635242
5/2/2018 20:30	6.50635242
5/2/2018 20:45	6.50635242
5/2/2018 21:00	4.59149694
5/2/2018 21:15	4.59149694
5/2/2018 21:30	4.59149694
5/2/2018 21:45	6.05922508
5/2/2018 22:00	6.11046886
5/2/2018 22:15	6.00278711
5/2/2018 22:30	5.87962341
5/2/2018 22:45	5.43772602
5/2/2018 23:00	4.75267935
5/2/2018 23:15	4.46772337
5/2/2018 23:30	4.33551359
5/2/2018 23:45	0
5/3/2018 0:00	0
5/3/2018 0:15	0
5/3/2018 0:30	0
5/3/2018 0:45	0
5/3/2018 1:00	0
5/3/2018 1:15	0
5/3/2018 1:30	0
5/3/2018 1:45	0
5/3/2018 2:00	0
5/3/2018 2:15	0
5/3/2018 2:30	0
5/3/2018 2:45	0
5/3/2018 3:00	0
5/3/2018 3:15	0
5/3/2018 3:30	0
5/3/2018 3:45	0
5/3/2018 4:00	0
5/3/2018 4:15	0
5/3/2018 4:30	0
5/3/2018 4:45	0
5/3/2018 5:00	0
5/3/2018 5:15	0
5/3/2018 5:30	0
5/3/2018 5:45	0
5/3/2018 6:00	0
5/3/2018 6:15	0
5/3/2018 6:30	0
5/3/2018 6:45	0
5/3/2018 7:00	0
5/3/2018 7:15	0
5/3/2018 7:30	0
5/3/2018 7:45	4.2366786
5/3/2018 8:00	4.0981288
5/3/2018 8:15	4.0981288
5/3/2018 8:30	4.0981288
5/3/2018 8:45	4.00407267
5/3/2018 9:00	3.93689394
5/3/2018 9:15	3.93689394
5/3/2018 9:30	3.84856558
5/3/2018 9:45	0
5/3/2018 10:00	0
5/3/2018 10:15	0
5/3/2018 10:30	0
5/3/2018 10:45	0
5/3/2018 11:00	0
5/3/2018 11:15	3.72227931
5/3/2018 11:30	3.96466184
5/3/2018 11:45	4.11369562
5/3/2018 12:00	4.05061245
5/3/2018 12:15	4.30382872
5/3/2018 12:30	4.86933136
5/3/2018 12:45	5.91610003
5/3/2018 13:00	6.39763021
5/3/2018 13:15	8.12280273
5/3/2018 13:30	8.55247974
5/3/2018 13:45	8.29302311
5/3/2018 14:00	8.03371525
5/3/2018 14:15	8.03371525

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5/3/2018 14:30	4.56582212
5/3/2018 14:45	4.44547224
5/3/2018 15:00	4.30615187
5/3/2018 15:15	4.30615187
5/3/2018 15:30	4.30615187
5/3/2018 15:45	4.51561594
5/3/2018 16:00	4.94038248
5/3/2018 16:15	5.10921097
5/3/2018 16:30	4.87968254
5/3/2018 16:45	4.93334532
5/3/2018 17:00	5.95058918
5/3/2018 17:15	5.69409466
5/3/2018 17:30	6.67889547
5/3/2018 17:45	6.67889547
5/3/2018 18:00	6.67889547
5/3/2018 18:15	6.56595659
5/3/2018 18:30	4.24064398
5/3/2018 18:45	0
5/3/2018 19:00	3.87742782
5/3/2018 19:15	6.24224615
5/3/2018 19:30	4.98090267
5/3/2018 19:45	5.74371243
5/3/2018 20:00	5.74371243
5/3/2018 20:15	5.38466072
5/3/2018 20:30	5.14445543
5/3/2018 20:45	5.05875349
5/3/2018 21:00	5.23575926
5/3/2018 21:15	5.32445955
5/3/2018 21:30	5.05203247
5/3/2018 21:45	5.17232609
5/3/2018 22:00	5.59804392
5/3/2018 22:15	4.78589106
5/3/2018 22:30	4.39039946
5/3/2018 22:45	0
5/3/2018 23:00	0
5/3/2018 23:15	0
5/3/2018 23:30	0
5/3/2018 23:45	0
5/4/2018 0:00	0
5/4/2018 0:15	0
5/4/2018 0:30	0
5/4/2018 0:45	0
5/4/2018 1:00	0
5/4/2018 1:15	0
5/4/2018 1:30	0
5/4/2018 1:45	0
5/4/2018 2:00	0
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5/4/2018 6:15	0
5/4/2018 6:30	0
5/4/2018 6:45	0
5/4/2018 7:00	0
5/4/2018 7:15	0
5/4/2018 7:30	0
5/4/2018 7:45	9.04543972
5/4/2018 8:00	9.20631218
5/4/2018 8:15	9.36802197
5/4/2018 8:30	9.39044094
5/4/2018 8:45	9.39044094
5/4/2018 9:00	9.39044094
5/4/2018 9:15	8.9718895
5/4/2018 9:30	8.9718895
5/4/2018 9:45	4.28954792
5/4/2018 10:00	4.04249382
5/4/2018 10:15	3.8386991
5/4/2018 10:30	3.78709149
5/4/2018 10:45	4.05121422
5/4/2018 11:00	4.32455015
5/4/2018 11:15	4.6077342
5/4/2018 11:30	9.10361099
5/4/2018 11:45	8.96637344
5/4/2018 12:00	8.96637344
5/4/2018 12:15	8.66837788
5/4/2018 12:30	8.37286949
5/4/2018 12:45	8.37286949
5/4/2018 13:00	8.13834667
5/4/2018 13:15	7.92559862
5/4/2018 13:30	4.19326401
5/4/2018 13:45	5.02485752
5/4/2018 14:00	5.02485752
5/4/2018 14:15	4.86370468

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5/4/2018 14:30	4.94558477
5/4/2018 14:45	5.00020838
5/4/2018 15:00	5.00020838
5/4/2018 15:15	4.71060944
5/4/2018 15:30	4.63499975
5/4/2018 15:45	0
5/4/2018 16:00	0
5/4/2018 16:15	0
5/4/2018 16:30	0
5/4/2018 16:45	0
5/4/2018 17:00	0
5/4/2018 17:15	0
5/4/2018 17:30	0
5/4/2018 17:45	0
5/4/2018 18:00	0
5/4/2018 18:15	0
5/4/2018 18:30	0
5/4/2018 18:45	0
5/4/2018 19:00	0
5/4/2018 19:15	0
5/4/2018 19:30	0
5/4/2018 19:45	4.22056437
5/4/2018 20:00	4.60217524
5/4/2018 20:15	7.22449493
5/4/2018 20:30	5.87075806
5/4/2018 20:45	6.62084007
5/4/2018 21:00	6.83240604
5/4/2018 21:15	6.21260881
5/4/2018 21:30	4.28390265
5/4/2018 21:45	4.04495287
5/4/2018 22:00	3.85609722
5/4/2018 22:15	3.85609722
5/4/2018 22:30	3.85609722
5/4/2018 22:45	3.86783028
5/4/2018 23:00	0
5/4/2018 23:15	0
5/4/2018 23:30	0
5/4/2018 23:45	0
5/5/2018 0:00	0
5/5/2018 0:15	0
5/5/2018 0:30	0
5/5/2018 0:45	4.31677866
5/5/2018 1:00	4.31677866
5/5/2018 1:15	4.36951685
5/5/2018 1:30	4.36951685
5/5/2018 1:45	4.36951685
5/5/2018 2:00	4.52524614
5/5/2018 2:15	4.57578516
5/5/2018 2:30	4.57578516
5/5/2018 2:45	4.57578516
5/5/2018 3:00	4.57578516
5/5/2018 3:15	4.57578516
5/5/2018 3:30	0
5/5/2018 3:45	0
5/5/2018 4:00	0
5/5/2018 4:15	7.2271328
5/5/2018 4:30	7.2271328
5/5/2018 4:45	7.2271328
5/5/2018 5:00	7.11053658
5/5/2018 5:15	7.11053658
5/5/2018 5:30	7.11053658
5/5/2018 5:45	7.13238525
5/5/2018 6:00	7.13238525
5/5/2018 6:15	0
5/5/2018 6:30	0
5/5/2018 6:45	0
5/5/2018 7:00	0
5/5/2018 7:15	0
5/5/2018 7:30	3.58025789
5/5/2018 7:45	3.80102777
5/5/2018 8:00	3.8625102
5/5/2018 8:15	3.84338546
5/5/2018 8:30	4.0579648
5/5/2018 8:45	6.24808598
5/5/2018 9:00	6.3491497
5/5/2018 9:15	6.24808598
5/5/2018 9:30	6.43162155
5/5/2018 9:45	7.59842348
5/5/2018 10:00	9.61205006
5/5/2018 10:15	9.61205006
5/5/2018 10:30	9.61205006
5/5/2018 10:45	4.53924036
5/5/2018 11:00	4.11131001
5/5/2018 11:15	3.97897792
5/5/2018 11:30	3.89298248
5/5/2018 11:45	3.57402611
5/5/2018 12:00	3.44757915
5/5/2018 12:15	0
5/5/2018 12:30	0
5/5/2018 12:45	0
5/5/2018 13:00	0
5/5/2018 13:15	0
5/5/2018 13:30	0
5/5/2018 13:45	0
5/5/2018 14:00	0
5/5/2018 14:15	3.18058848

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5/5/2018 14:30	3.80057693
5/5/2018 14:45	5.93757534
5/5/2018 15:00	5.93757534
5/5/2018 15:15	5.93757534
5/5/2018 15:30	4.05311728
5/5/2018 15:45	3.93379021
5/5/2018 16:00	3.94216084
5/5/2018 16:15	3.98688388
5/5/2018 16:30	3.94216084
5/5/2018 16:45	3.98688388
5/5/2018 17:00	3.94216084
5/5/2018 17:15	3.96252346
5/5/2018 17:30	3.88966274
5/5/2018 17:45	3.97475791
5/5/2018 18:00	3.96252346
5/5/2018 18:15	7.37888479
5/5/2018 18:30	7.37888479
5/5/2018 18:45	7.37888479
5/5/2018 19:00	4.51549006
5/5/2018 19:15	4.33033085
5/5/2018 19:30	4.33033085
5/5/2018 19:45	4.34774828
5/5/2018 20:00	4.42003393
5/5/2018 20:15	4.33508015
5/5/2018 20:30	4.42003393
5/5/2018 20:45	4.43841791
5/5/2018 21:00	4.43841791
5/5/2018 21:15	4.65831757
5/5/2018 21:30	4.70875883
5/5/2018 21:45	4.70875883
5/5/2018 22:00	4.60841703
5/5/2018 22:15	3.78995156
5/5/2018 22:30	3.47254252
5/5/2018 22:45	3.29279613
5/5/2018 23:00	3.19328403
5/5/2018 23:15	3.19328403
5/5/2018 23:30	3.04184079
5/5/2018 23:45	0
5/6/2018 0:00	0
5/6/2018 0:15	0
5/6/2018 0:30	0
5/6/2018 0:45	0
5/6/2018 1:00	0
5/6/2018 1:15	0
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5/6/2018 3:30	0
5/6/2018 3:45	0
5/6/2018 4:00	0
5/6/2018 4:15	0
5/6/2018 4:30	0
5/6/2018 4:45	0
5/6/2018 5:00	2.36734271
5/6/2018 5:15	4.31290817
5/6/2018 5:30	3.43646765
5/6/2018 5:45	4.698277
5/6/2018 6:00	4.78664732
5/6/2018 6:15	4.64502907
5/6/2018 6:30	4.71582937
5/6/2018 6:45	3.53630495
5/6/2018 7:00	3.53630495
5/6/2018 7:15	3.49161959
5/6/2018 7:30	3.55661654
5/6/2018 7:45	3.55661654
5/6/2018 8:00	3.55661654
5/6/2018 8:15	3.55661654
5/6/2018 8:30	3.60099339
5/6/2018 8:45	3.91764021
5/6/2018 9:00	3.8469522
5/6/2018 9:15	6.4114337
5/6/2018 9:30	5.02293015
5/6/2018 9:45	4.98171091
5/6/2018 10:00	3.83721328
5/6/2018 10:15	3.75301027
5/6/2018 10:30	3.62409616
5/6/2018 10:45	3.56469345
5/6/2018 11:00	3.55356383
5/6/2018 11:15	3.35623074
5/6/2018 11:30	0
5/6/2018 11:45	0
5/6/2018 12:00	0
5/6/2018 12:15	3.74768949
5/6/2018 12:30	3.68611646
5/6/2018 12:45	3.77991295
5/6/2018 13:00	3.84708738
5/6/2018 13:15	3.84708738
5/6/2018 13:30	3.73741364
5/6/2018 13:45	3.79984355
5/6/2018 14:00	3.79984355
5/6/2018 14:15	3.73298216

Site 14 – MH 13.03 Flow Meter Data

5/6/2018 14:30	4.24033976
5/6/2018 14:45	4.45329142
5/6/2018 15:00	5.34794807
5/6/2018 15:15	5.34794807
5/6/2018 15:30	5.52497816
5/6/2018 15:45	5.18948174
5/6/2018 16:00	4.46582794
5/6/2018 16:15	4.5404253
5/6/2018 16:30	4.42449856
5/6/2018 16:45	4.42449856
5/6/2018 17:00	4.56856012
5/6/2018 17:15	6.09366846
5/6/2018 17:30	5.99238729
5/6/2018 17:45	5.99238729
5/6/2018 18:00	5.90271664
5/6/2018 18:15	5.88400984
5/6/2018 18:30	5.98370028
5/6/2018 18:45	5.63617754
5/6/2018 19:00	5.33158779
5/6/2018 19:15	5.14967299
5/6/2018 19:30	4.52302122
5/6/2018 19:45	4.14577532
5/6/2018 20:00	4.14577532
5/6/2018 20:15	4.14577532
5/6/2018 20:30	4.37093353
5/6/2018 20:45	4.37093353
5/6/2018 21:00	0
5/6/2018 21:15	0
5/6/2018 21:30	0
5/6/2018 21:45	0
5/6/2018 22:00	0
5/6/2018 22:15	0
5/6/2018 22:30	0
5/6/2018 22:45	0
5/6/2018 23:00	0
5/6/2018 23:15	0
5/6/2018 23:30	0
5/6/2018 23:45	0
5/7/2018 0:00	0
5/7/2018 0:15	0
5/7/2018 0:30	0
5/7/2018 0:45	0
5/7/2018 1:00	0
5/7/2018 1:15	0
5/7/2018 1:30	0
5/7/2018 1:45	0
5/7/2018 2:00	0
5/7/2018 2:15	0
5/7/2018 2:30	0
5/7/2018 2:45	0
5/7/2018 3:00	0
5/7/2018 3:15	0
5/7/2018 3:30	0
5/7/2018 3:45	0
5/7/2018 4:00	0
5/7/2018 4:15	0
5/7/2018 4:30	0
5/7/2018 4:45	0
5/7/2018 5:00	0
5/7/2018 5:15	0
5/7/2018 5:30	0
5/7/2018 5:45	0
5/7/2018 6:00	0
5/7/2018 6:15	0
5/7/2018 6:30	0
5/7/2018 6:45	0
5/7/2018 7:00	0
5/7/2018 7:15	0
5/7/2018 7:30	0
5/7/2018 7:45	0
5/7/2018 8:00	0
5/7/2018 8:15	3.83599114
5/7/2018 8:30	3.89513755
5/7/2018 8:45	3.89513755
5/7/2018 9:00	3.89513755
5/7/2018 9:15	0
5/7/2018 9:30	0
5/7/2018 9:45	1.88885343
5/7/2018 10:00	4.27412605
5/7/2018 10:15	3.10830927
5/7/2018 10:30	4.27412605
5/7/2018 10:45	3.70831561
5/7/2018 11:00	3.70831561
5/7/2018 11:15	3.70831561
5/7/2018 11:30	4.7969017
5/7/2018 11:45	4.80845022
5/7/2018 12:00	4.80947828
5/7/2018 12:15	4.80947828
5/7/2018 12:30	0
5/7/2018 12:45	0
5/7/2018 13:00	0
5/7/2018 13:15	0
5/7/2018 13:30	0
5/7/2018 13:45	2.15034986
5/7/2018 14:00	3.28700566
5/7/2018 14:15	3.14189839

Site 14 – MH 13.03 Flow Meter Data

5/7/2018 14:30	3.670506
5/7/2018 14:45	3.670506
5/7/2018 15:00	3.670506
5/7/2018 15:15	3.670506
5/7/2018 15:30	3.670506
5/7/2018 15:45	3.65897632
5/7/2018 16:00	3.54890943
5/7/2018 16:15	0
5/7/2018 16:30	0
5/7/2018 16:45	0
5/7/2018 17:00	0
5/7/2018 17:15	0
5/7/2018 17:30	0
5/7/2018 17:45	0
5/7/2018 18:00	3.15596271
5/7/2018 18:15	3.24843097
5/7/2018 18:30	3.24843097
5/7/2018 18:45	3.24843097
5/7/2018 19:00	3.24843097
5/7/2018 19:15	4.77772188
5/7/2018 19:30	4.77772188
5/7/2018 19:45	4.77772188
5/7/2018 20:00	4.08094835
5/7/2018 20:15	4.05999184
5/7/2018 20:30	3.78966379
5/7/2018 20:45	0
5/7/2018 21:00	0
5/7/2018 21:15	0
5/7/2018 21:30	5.68971109
5/7/2018 21:45	5.68971109
5/7/2018 22:00	5.68971109
5/7/2018 22:15	5.96014881
5/7/2018 22:30	5.31732178
5/7/2018 22:45	4.41120529
5/7/2018 23:00	0
5/7/2018 23:15	0
5/7/2018 23:30	0
5/7/2018 23:45	0
5/8/2018 0:00	0
5/8/2018 0:15	0
5/8/2018 0:30	0
5/8/2018 0:45	0
5/8/2018 1:00	0
5/8/2018 1:15	0
5/8/2018 1:30	0
5/8/2018 1:45	0
5/8/2018 2:00	0
5/8/2018 2:15	0
5/8/2018 2:30	0
5/8/2018 2:45	0
5/8/2018 3:00	0
5/8/2018 3:15	0
5/8/2018 3:30	0
5/8/2018 3:45	0
5/8/2018 4:00	0
5/8/2018 4:15	0
5/8/2018 4:30	0
5/8/2018 4:45	0
5/8/2018 5:00	0
5/8/2018 5:15	0
5/8/2018 5:30	0
5/8/2018 5:45	0
5/8/2018 6:00	0
5/8/2018 6:15	3.53562021
5/8/2018 6:30	3.62541771
5/8/2018 6:45	3.36994338
5/8/2018 7:00	3.36994338
5/8/2018 7:15	3.36994338
5/8/2018 7:30	3.83863902
5/8/2018 7:45	3.90337753
5/8/2018 8:00	3.82042885
5/8/2018 8:15	3.82042885
5/8/2018 8:30	3.83863902
5/8/2018 8:45	3.83863902
5/8/2018 9:00	3.83863902
5/8/2018 9:15	3.90337753
5/8/2018 9:30	3.90337753
5/8/2018 9:45	3.9481802
5/8/2018 10:00	4.46901894
5/8/2018 10:15	4.46901894
5/8/2018 10:30	4.46901894
5/8/2018 10:45	4.46901894
5/8/2018 11:00	4.34358263
5/8/2018 11:15	4.34358263
5/8/2018 11:30	3.5782218
5/8/2018 11:45	3.48082066
5/8/2018 12:00	3.4171977
5/8/2018 12:15	3.84366441
5/8/2018 12:30	3.4171977
5/8/2018 12:45	3.4171977
5/8/2018 13:00	4.42721176
5/8/2018 13:15	4.79398394
5/8/2018 13:30	4.85469246
5/8/2018 13:45	4.85469246
5/8/2018 14:00	4.85469246
5/8/2018 14:15	4.12433815

Site 14 – MH 13.03 Flow Meter Data

5/8/2018 14:30	3.55890107
5/8/2018 14:45	3.55890107
5/8/2018 15:00	3.55890107
5/8/2018 15:15	3.44127107
5/8/2018 15:30	0
5/8/2018 15:45	0
5/8/2018 16:00	0
5/8/2018 16:15	0
5/8/2018 16:30	0
5/8/2018 16:45	0
5/8/2018 17:00	3.67779684
5/8/2018 17:15	3.7624228
5/8/2018 17:30	3.69913173
5/8/2018 17:45	3.694767
5/8/2018 18:00	3.38362193
5/8/2018 18:15	3.38362193
5/8/2018 18:30	3.38362193
5/8/2018 18:45	3.38362193
5/8/2018 19:00	3.55265784
5/8/2018 19:15	3.61975694
5/8/2018 19:30	3.55265784
5/8/2018 19:45	3.48923206
5/8/2018 20:00	3.87871027
5/8/2018 20:15	3.94428277
5/8/2018 20:30	3.92131829
5/8/2018 20:45	3.92131829
5/8/2018 21:00	4.31925011
5/8/2018 21:15	4.28527927
5/8/2018 21:30	3.95591807
5/8/2018 21:45	3.95161057
5/8/2018 22:00	3.76210117
5/8/2018 22:15	3.38018322
5/8/2018 22:30	3.24948001
5/8/2018 22:45	3.08664989
5/8/2018 23:00	3.3642211
5/8/2018 23:15	7.88438225
5/8/2018 23:30	8.22075653
5/8/2018 23:45	8.22075653
5/9/2018 0:00	8.75627708
5/9/2018 0:15	8.44981766
5/9/2018 0:30	8.44981766
5/9/2018 0:45	8.17263699
5/9/2018 1:00	8.17129135
5/9/2018 1:15	0
5/9/2018 1:30	0
5/9/2018 1:45	0
5/9/2018 2:00	0
5/9/2018 2:15	0
5/9/2018 2:30	4.72924662
5/9/2018 2:45	9.32966709
5/9/2018 3:00	7.28836346
5/9/2018 3:15	9.63504505
5/9/2018 3:30	11.7422085
5/9/2018 3:45	11.7422085
5/9/2018 4:00	13.6444654
5/9/2018 4:15	14.2935734
5/9/2018 4:30	13.6444654
5/9/2018 4:45	13.2176886
5/9/2018 5:00	13.2176886
5/9/2018 5:15	13.0100431
5/9/2018 5:30	13.0100431
5/9/2018 5:45	11.7770872
5/9/2018 6:00	12.8821754
5/9/2018 6:15	5.54180717
5/9/2018 6:30	5.35741472
5/9/2018 6:45	4.57453775
5/9/2018 7:00	4.57453775
5/9/2018 7:15	4.95663595
5/9/2018 7:30	5.01446342
5/9/2018 7:45	5.01446342
5/9/2018 8:00	5.64023685
5/9/2018 8:15	6.03142643
5/9/2018 8:30	5.090662
5/9/2018 8:45	4.3764782
5/9/2018 9:00	4.3764782
5/9/2018 9:15	4.22863388
5/9/2018 9:30	4.22863388
5/9/2018 9:45	4.326159
5/9/2018 10:00	4.90872669
5/9/2018 10:15	4.90872669
5/9/2018 10:30	7.28594255
5/9/2018 10:45	5.03458071
5/9/2018 11:00	4.58438492
5/9/2018 11:15	3.93020892
5/9/2018 11:30	4.04289341
5/9/2018 11:45	3.93020892
5/9/2018 12:00	3.95374894
5/9/2018 12:15	3.95374894
5/9/2018 12:30	3.88708568
5/9/2018 12:45	3.88708568
5/9/2018 13:00	4.02801132
5/9/2018 13:15	4.02801132
5/9/2018 13:30	4.14848137
5/9/2018 13:45	4.14848137
5/9/2018 14:00	4.12669039
5/9/2018 14:15	3.71643376

Site 14 – MH 13.03 Flow Meter Data

5/9/2018 14:30	4.03070116
5/9/2018 14:45	4.03070116
5/9/2018 15:00	4.29661131
5/9/2018 15:15	4.29661131
5/9/2018 15:30	4.29661131
5/9/2018 15:45	4.07314491
5/9/2018 16:00	3.61334944
5/9/2018 16:15	3.43321729
5/9/2018 16:30	3.37378764
5/9/2018 16:45	3.45656157
5/9/2018 17:00	3.45656157
5/9/2018 17:15	3.64016867
5/9/2018 17:30	3.75764489
5/9/2018 17:45	3.48568392
5/9/2018 18:00	3.48568392
5/9/2018 18:15	3.51122594
5/9/2018 18:30	3.39450407
5/9/2018 18:45	3.63682294
5/9/2018 19:00	3.63682294
5/9/2018 19:15	3.63682294
5/9/2018 19:30	3.63682294
5/9/2018 19:45	3.63682294
5/9/2018 20:00	3.6797533
5/9/2018 20:15	4.64414406
5/9/2018 20:30	5.84126234
5/9/2018 20:45	7.16906309
5/9/2018 21:00	6.44846582
5/9/2018 21:15	5.84126234
5/9/2018 21:30	5.3898387
5/9/2018 21:45	4.93467522
5/9/2018 22:00	4.24502039
5/9/2018 22:15	3.11097813
5/9/2018 22:30	2.53997326
5/9/2018 22:45	2.58763695
5/9/2018 23:00	2.98185754
5/9/2018 23:15	3.12949991
5/9/2018 23:30	3.07185531
5/9/2018 23:45	3.07185531
5/10/2018 0:00	0
5/10/2018 0:15	0
5/10/2018 0:30	0
5/10/2018 0:45	0
5/10/2018 1:00	0
5/10/2018 1:15	0
5/10/2018 1:30	0
5/10/2018 1:45	0
5/10/2018 2:00	0
5/10/2018 2:15	0
5/10/2018 2:30	0
5/10/2018 2:45	0
5/10/2018 3:00	0
5/10/2018 3:15	0
5/10/2018 3:30	0
5/10/2018 3:45	0
5/10/2018 4:00	0
5/10/2018 4:15	0
5/10/2018 4:30	0
5/10/2018 4:45	0
5/10/2018 5:00	0
5/10/2018 5:15	0
5/10/2018 5:30	0
5/10/2018 5:45	0
5/10/2018 6:00	0
5/10/2018 6:15	6.5127058
5/10/2018 6:30	12.8629265
5/10/2018 6:45	9.72498417
5/10/2018 7:00	13.0115995
5/10/2018 7:15	13.0115995
5/10/2018 7:30	14.5490189
5/10/2018 7:45	14.5630884
5/10/2018 8:00	15.7893505
5/10/2018 8:15	23.2017384
5/10/2018 8:30	23.2017384
5/10/2018 8:45	23.2017384
5/10/2018 9:00	20.6876984
5/10/2018 9:15	4.648314
5/10/2018 9:30	4.648314
5/10/2018 9:45	4.54995584
5/10/2018 10:00	4.648314
5/10/2018 10:15	4.90794373
5/10/2018 10:30	4.90794373
5/10/2018 10:45	4.59811306
5/10/2018 11:00	4.59811306
5/10/2018 11:15	4.16925001
5/10/2018 11:30	4.05589819
5/10/2018 11:45	4.05589819
5/10/2018 12:00	4.05589819
5/10/2018 12:15	4.05589819
5/10/2018 12:30	3.880162
5/10/2018 12:45	0
5/10/2018 13:00	0
5/10/2018 13:15	0
5/10/2018 13:30	0
5/10/2018 13:45	3.8607986
5/10/2018 14:00	3.90646386
5/10/2018 14:15	3.93669987

Site 14 – MH 13.03 Flow Meter Data

5/10/2018 14:30	3.79350805
5/10/2018 14:45	3.80250049
5/10/2018 15:00	3.79350805
5/10/2018 15:15	3.79350805
5/10/2018 15:30	3.8856144
5/10/2018 15:45	3.8856144
5/10/2018 16:00	3.8856144
5/10/2018 16:15	6.32907391
5/10/2018 16:30	6.24296474
5/10/2018 16:45	6.24296474
5/10/2018 17:00	6.06569195
5/10/2018 17:15	5.96195745
5/10/2018 17:30	5.79260397
5/10/2018 17:45	5.71764898
5/10/2018 18:00	0
5/10/2018 18:15	0
5/10/2018 18:30	0
5/10/2018 18:45	3.24097657
5/10/2018 19:00	3.67383432
5/10/2018 19:15	4.14321327
5/10/2018 19:30	4.58931398
5/10/2018 19:45	4.80776787
5/10/2018 20:00	5.70399857
5/10/2018 20:15	6.3255167
5/10/2018 20:30	6.87973881
5/10/2018 20:45	6.60886335
5/10/2018 21:00	6.3255167
5/10/2018 21:15	3.72960639
5/10/2018 21:30	4.10189056
5/10/2018 21:45	3.72960639
5/10/2018 22:00	4.14302874
5/10/2018 22:15	4.47395754
5/10/2018 22:30	5.04025936
5/10/2018 22:45	5.04025936
5/10/2018 23:00	5.26032925
5/10/2018 23:15	5.26032925
5/10/2018 23:30	5.26032925
5/10/2018 23:45	5.17015743
5/11/2018 0:00	4.98411226
5/11/2018 0:15	4.75381136
5/11/2018 0:30	0
5/11/2018 0:45	0
5/11/2018 1:00	0
5/11/2018 1:15	0
5/11/2018 1:30	4.5194397
5/11/2018 1:45	4.35510683
5/11/2018 2:00	4.35510683
5/11/2018 2:15	4.29692316
5/11/2018 2:30	4.1350646
5/11/2018 2:45	4.1350646
5/11/2018 3:00	4.0824008
5/11/2018 3:15	4.04064846
5/11/2018 3:30	0
5/11/2018 3:45	0
5/11/2018 4:00	0
5/11/2018 4:15	2.26521778
5/11/2018 4:30	4.06230736
5/11/2018 4:45	3.20908189
5/11/2018 5:00	4.21322012
5/11/2018 5:15	4.69873905
5/11/2018 5:30	4.48497343
5/11/2018 5:45	5.19128895
5/11/2018 6:00	5.19128895
5/11/2018 6:15	5.04081678
5/11/2018 6:30	5.06103611
5/11/2018 6:45	5.06103611
5/11/2018 7:00	4.34708929
5/11/2018 7:15	5.06103611
5/11/2018 7:30	5.31718254
5/11/2018 7:45	4.84427595
5/11/2018 8:00	4.84427595
5/11/2018 8:15	4.84427595
5/11/2018 8:30	4.54900789
5/11/2018 8:45	4.31643772
5/11/2018 9:00	4.31643772
5/11/2018 9:15	4.12535667
5/11/2018 9:30	4.08078289
5/11/2018 9:45	4.31643772
5/11/2018 10:00	0

Site 15 – MH 7.05 (South)

Inst Time	Flow 3 (gpm)
4/24/2018 15:45	0
4/24/2018 16:00	0
4/24/2018 16:15	0
4/24/2018 16:30	0
4/24/2018 16:45	0
4/24/2018 17:00	0
4/24/2018 17:15	0
4/24/2018 17:30	3.439456224
4/24/2018 17:45	5.580286503
4/24/2018 18:00	13.91118813
4/24/2018 18:15	6.878912449
4/24/2018 18:30	36.76714325
4/24/2018 18:45	40.61633301
4/24/2018 19:00	57.4891243
4/24/2018 19:15	74.36475372
4/24/2018 19:30	47.7611618
4/24/2018 19:45	15.89892483
4/24/2018 20:00	8.483523369
4/24/2018 20:15	8.012799263
4/24/2018 20:30	5.300151348
4/24/2018 20:45	4.941914558
4/24/2018 21:00	4.941914558
4/24/2018 21:15	5.498648167
4/24/2018 21:30	5.120740891
4/24/2018 21:45	5.120740891
4/24/2018 22:00	5.120740891
4/24/2018 22:15	0
4/24/2018 22:30	0
4/24/2018 22:45	0
4/24/2018 23:00	0
4/24/2018 23:15	0
4/24/2018 23:30	0
4/24/2018 23:45	0
4/25/2018 0:00	0
4/25/2018 0:15	0
4/25/2018 0:30	0
4/25/2018 0:45	0
4/25/2018 1:00	0
4/25/2018 1:15	0
4/25/2018 1:30	0
4/25/2018 1:45	0
4/25/2018 2:00	0
4/25/2018 2:15	0
4/25/2018 2:30	33.80383301
4/25/2018 2:45	25.46378708
4/25/2018 3:00	33.80383301
4/25/2018 3:15	33.80383301
4/25/2018 3:30	34.21966553
4/25/2018 3:45	0
4/25/2018 4:00	0
4/25/2018 4:15	0
4/25/2018 4:30	0
4/25/2018 4:45	0
4/25/2018 5:00	0
4/25/2018 5:15	26.12960815
4/25/2018 5:30	40.1877594
4/25/2018 5:45	35.58004379
4/25/2018 6:00	44.13195801
4/25/2018 6:15	44.13195801
4/25/2018 6:30	35.56147385
4/25/2018 6:45	4.630548954
4/25/2018 7:00	4.721832275
4/25/2018 7:15	4.317528725
4/25/2018 7:30	4.317528725
4/25/2018 7:45	0
4/25/2018 8:00	0
4/25/2018 8:15	0
4/25/2018 8:30	2.798191547
4/25/2018 8:45	4.409990788
4/25/2018 9:00	3.850185871
4/25/2018 9:15	4.848466873
4/25/2018 9:30	4.457203865
4/25/2018 9:45	4.327236652
4/25/2018 10:00	4.014200211
4/25/2018 10:15	3.493893623
4/25/2018 10:30	0
4/25/2018 10:45	0
4/25/2018 11:00	0
4/25/2018 11:15	0
4/25/2018 11:30	0
4/25/2018 11:45	0
4/25/2018 12:00	0
4/25/2018 12:15	0
4/25/2018 12:30	0
4/25/2018 12:45	0
4/25/2018 13:00	0
4/25/2018 13:15	36.93743896
4/25/2018 13:30	45.57594681
4/25/2018 13:45	62.53029251
4/25/2018 14:00	54.8253746
4/25/2018 14:15	0
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4/25/2018 14:45	2.811593056
4/25/2018 15:00	3.551305294
4/25/2018 15:15	4.986982822

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4/25/2018 15:30	4.935107708
4/25/2018 15:45	4.935107708
4/25/2018 16:00	4.935107708
4/25/2018 16:15	5.820622921
4/25/2018 16:30	5.454780102
4/25/2018 16:45	5.769499779
4/25/2018 17:00	5.769499779
4/25/2018 17:15	0
4/25/2018 17:30	0
4/25/2018 17:45	0
4/25/2018 18:00	0
4/25/2018 18:15	0
4/25/2018 18:30	0
4/25/2018 18:45	4.27883625
4/25/2018 19:00	8.714845657
4/25/2018 19:15	5.786494255
4/25/2018 19:30	6.218463898
4/25/2018 19:45	6.218463898
4/25/2018 20:00	6.586850166
4/25/2018 20:15	6.586850166
4/25/2018 20:30	15.49425411
4/25/2018 20:45	15.49425411
4/25/2018 21:00	15.49425411
4/25/2018 21:15	6.669725418
4/25/2018 21:30	6.669725418
4/25/2018 21:45	5.364191055
4/25/2018 22:00	5.210350513
4/25/2018 22:15	5.677827358
4/25/2018 22:30	5.734216213
4/25/2018 22:45	5.631855488
4/25/2018 23:00	5.459033966
4/25/2018 23:15	5.459033966
4/25/2018 23:30	4.794315815
4/25/2018 23:45	4.993541718
4/26/2018 0:00	5.494159222
4/26/2018 0:15	5.434754372
4/26/2018 0:30	5.434754372
4/26/2018 0:45	5.280476093
4/26/2018 1:00	5.280476093
4/26/2018 1:15	4.629458427
4/26/2018 1:30	4.416862488
4/26/2018 1:45	4.416862488
4/26/2018 2:00	4.412452698
4/26/2018 2:15	4.629458427
4/26/2018 2:30	4.795529366
4/26/2018 2:45	5.149130821
4/26/2018 3:00	5.841685295
4/26/2018 3:15	5.86579895
4/26/2018 3:30	5.86579895
4/26/2018 3:45	5.889076233
4/26/2018 4:00	5.889076233
4/26/2018 4:15	5.179727077
4/26/2018 4:30	5.179727077
4/26/2018 4:45	6.105979919
4/26/2018 5:00	6.408137321
4/26/2018 5:15	6.090823174
4/26/2018 5:30	6.38945055
4/26/2018 5:45	7.493423462
4/26/2018 6:00	6.090823174
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4/26/2018 6:45	6.502454281
4/26/2018 7:00	5.846390247
4/26/2018 7:15	5.967461109
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4/26/2018 7:45	8.500412941
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4/26/2018 8:15	8.74197197
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4/26/2018 8:45	7.739901543
4/26/2018 9:00	7.032628536
4/26/2018 9:15	7.032628536
4/26/2018 9:30	7.927778721
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4/26/2018 10:00	18.75010872
4/26/2018 10:15	19.16363335
4/26/2018 10:30	19.78791809
4/26/2018 10:45	9.561882019
4/26/2018 11:00	5.872977734
4/26/2018 11:15	6.445126534
4/26/2018 11:30	5.501601219
4/26/2018 11:45	4.811468601
4/26/2018 12:00	4.811468601
4/26/2018 12:15	5.708390236
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4/26/2018 12:45	5.392375946
4/26/2018 13:00	5.407837868
4/26/2018 13:15	5.407837868
4/26/2018 13:30	5.089794636
4/26/2018 13:45	5.429130077
4/26/2018 14:00	6.778870106
4/26/2018 14:15	5.647085667
4/26/2018 14:30	4.75672102
4/26/2018 14:45	5.527103424
4/26/2018 15:00	6.392605782
4/26/2018 15:15	6.453603745

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4/26/2018 15:30	6.453603745
4/26/2018 15:45	6.643435001
4/26/2018 16:00	6.942389488
4/26/2018 16:15	6.532725811
4/26/2018 16:30	7.444448471
4/26/2018 16:45	7.444448471
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4/26/2018 17:15	8.288351059
4/26/2018 17:30	7.071579456
4/26/2018 17:45	5.948523045
4/26/2018 18:00	6.225658417
4/26/2018 18:15	6.525962353
4/26/2018 18:30	7.63034296
4/26/2018 18:45	10.12468433
4/26/2018 19:00	14.84457779
4/26/2018 19:15	13.68012333
4/26/2018 19:30	11.82920933
4/26/2018 19:45	11.13016796
4/26/2018 20:00	9.558767319
4/26/2018 20:15	9.955324173
4/26/2018 20:30	9.976959229
4/26/2018 20:45	11.88727665
4/26/2018 21:00	11.55579472
4/26/2018 21:15	11.55579472
4/26/2018 21:30	10.42974091
4/26/2018 21:45	9.106742859
4/26/2018 22:00	7.896932125
4/26/2018 22:15	6.897393227
4/26/2018 22:30	6.897393227
4/26/2018 22:45	6.922249317
4/26/2018 23:00	6.986328125
4/26/2018 23:15	7.677884102
4/26/2018 23:30	7.677884102
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4/27/2018 0:00	8.81616497
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4/27/2018 1:00	7.794717312
4/27/2018 1:15	8.170178413
4/27/2018 1:30	6.159229279
4/27/2018 1:45	6.159229279
4/27/2018 2:00	7.656070232
4/27/2018 2:15	6.159229279
4/27/2018 2:30	6.350665092
4/27/2018 2:45	4.950031281
4/27/2018 3:00	4.170469761
4/27/2018 3:15	4.084378242
4/27/2018 3:30	4.084378242
4/27/2018 3:45	4.084378242
4/27/2018 4:00	4.084378242
4/27/2018 4:15	4.084378242
4/27/2018 4:30	4.227689743
4/27/2018 4:45	4.420769691
4/27/2018 5:00	4.712071419
4/27/2018 5:15	4.712071419
4/27/2018 5:30	4.621852398
4/27/2018 5:45	3.308620453
4/27/2018 6:00	3.308620453
4/27/2018 6:15	3.308620453
4/27/2018 6:30	4.372040749
4/27/2018 6:45	7.507702827
4/27/2018 7:00	8.81602478
4/27/2018 7:15	8.81602478
4/27/2018 7:30	8.81602478
4/27/2018 7:45	5.804860592
4/27/2018 8:00	4.791632175
4/27/2018 8:15	4.791632175
4/27/2018 8:30	3.619302034
4/27/2018 8:45	4.710735321
4/27/2018 9:00	6.28741169
4/27/2018 9:15	7.584021091
4/27/2018 9:30	8.533521652
4/27/2018 9:45	7.845549583
4/27/2018 10:00	6.295697212
4/27/2018 10:15	9.316773415
4/27/2018 10:30	7.396359444
4/27/2018 10:45	6.241332054
4/27/2018 11:00	6.525203705
4/27/2018 11:15	6.812747002
4/27/2018 11:30	5.515134335
4/27/2018 11:45	5.210013866
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4/27/2018 12:45	5.645706177
4/27/2018 13:00	7.137607098
4/27/2018 13:15	8.017288208
4/27/2018 13:30	10.54626751
4/27/2018 13:45	10.54626751
4/27/2018 14:00	10.54626751
4/27/2018 14:15	11.32672882
4/27/2018 14:30	0
4/27/2018 14:45	0
4/27/2018 15:00	0
4/27/2018 15:15	0

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4/27/2018 15:30	0
4/27/2018 15:45	0
4/27/2018 16:00	0
4/27/2018 16:15	0
4/27/2018 16:30	0
4/27/2018 16:45	0
4/27/2018 17:00	0
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4/27/2018 17:30	14.93772697
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4/27/2018 18:00	17.89749336
4/27/2018 18:15	18.45850563
4/27/2018 18:30	11.23248959
4/27/2018 18:45	5.609798908
4/27/2018 19:00	5.609798908
4/27/2018 19:15	6.528595924
4/27/2018 19:30	7.731740952
4/27/2018 19:45	15.25495815
4/27/2018 20:00	18.72455025
4/27/2018 20:15	8.838409424
4/27/2018 20:30	5.700517178
4/27/2018 20:45	6.997044563
4/27/2018 21:00	5.569383621
4/27/2018 21:15	5.569383621
4/27/2018 21:30	5.569383621
4/27/2018 21:45	6.511758327
4/27/2018 22:00	4.809767246
4/27/2018 22:15	4.643741131
4/27/2018 22:30	3.76307869
4/27/2018 22:45	0
4/27/2018 23:00	0
4/27/2018 23:15	0
4/27/2018 23:30	0
4/27/2018 23:45	2.731900692
4/28/2018 0:00	2.670123816
4/28/2018 0:15	2.866196632
4/28/2018 0:30	3.759222269
4/28/2018 0:45	3.870301962
4/28/2018 1:00	3.721244097
4/28/2018 1:15	3.564148664
4/28/2018 1:30	3.809488535
4/28/2018 1:45	0
4/28/2018 2:00	0
4/28/2018 2:15	0
4/28/2018 2:30	0
4/28/2018 2:45	0
4/28/2018 3:00	0
4/28/2018 3:15	0
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4/28/2018 3:45	0
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4/28/2018 5:00	0
4/28/2018 5:15	0
4/28/2018 5:30	0
4/28/2018 5:45	0
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4/28/2018 6:15	0
4/28/2018 6:30	0
4/28/2018 6:45	6.366354465
4/28/2018 7:00	9.817219734
4/28/2018 7:15	16.56164169
4/28/2018 7:30	16.56164169
4/28/2018 7:45	18.53785133
4/28/2018 8:00	20.95655823
4/28/2018 8:15	14.27552414
4/28/2018 8:30	12.2756567
4/28/2018 8:45	12.54904556
4/28/2018 9:00	10.83156395
4/28/2018 9:15	9.439757347
4/28/2018 9:30	9.439757347
4/28/2018 9:45	9.266957283
4/28/2018 10:00	9.266957283
4/28/2018 10:15	9.266957283
4/28/2018 10:30	9.266957283
4/28/2018 10:45	9.294210434
4/28/2018 11:00	9.320070267
4/28/2018 11:15	11.26360512
4/28/2018 11:30	11.36154747
4/28/2018 11:45	10.92435265
4/28/2018 12:00	11.39852619
4/28/2018 12:15	12.45907402
4/28/2018 12:30	10.97256851
4/28/2018 12:45	10.84498596
4/28/2018 13:00	8.031602859
4/28/2018 13:15	7.454845905
4/28/2018 13:30	7.209632874
4/28/2018 13:45	6.694630146
4/28/2018 14:00	6.43383646
4/28/2018 14:15	6.43383646
4/28/2018 14:30	6.939330101
4/28/2018 14:45	7.136036873
4/28/2018 15:00	7.136036873
4/28/2018 15:15	8.451764107

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4/28/2018 15:30	8.451764107
4/28/2018 15:45	9.196036339
4/28/2018 16:00	9.333151817
4/28/2018 16:15	10.55073929
4/28/2018 16:30	10.70805264
4/28/2018 16:45	10.55073929
4/28/2018 17:00	11.5724411
4/28/2018 17:15	11.5724411
4/28/2018 17:30	11.4189949
4/28/2018 17:45	10.37167358
4/28/2018 18:00	8.499536514
4/28/2018 18:15	8.081220627
4/28/2018 18:30	8.461593628
4/28/2018 18:45	8.444669724
4/28/2018 19:00	9.899731636
4/28/2018 19:15	9.899731636
4/28/2018 19:30	10.3367548
4/28/2018 19:45	12.84346581
4/28/2018 20:00	9.766992569
4/28/2018 20:15	0
4/28/2018 20:30	0
4/28/2018 20:45	5.554402351
4/28/2018 21:00	8.094944954
4/28/2018 21:15	7.022218227
4/28/2018 21:30	8.53670311
4/28/2018 21:45	7.580839157
4/28/2018 22:00	7.580839157
4/28/2018 22:15	7.700408459
4/28/2018 22:30	7.693008423
4/28/2018 22:45	7.700408459
4/28/2018 23:00	7.700408459
4/28/2018 23:15	7.638010502
4/28/2018 23:30	7.497745991
4/28/2018 23:45	7.287566185
4/29/2018 0:00	6.085369587
4/29/2018 0:15	5.918465614
4/29/2018 0:30	5.918465614
4/29/2018 0:45	5.918465614
4/29/2018 1:00	5.872158527
4/29/2018 1:15	6.268369675
4/29/2018 1:30	6.284319401
4/29/2018 1:45	6.236158848
4/29/2018 2:00	6.119164467
4/29/2018 2:15	6.032997608
4/29/2018 2:30	6.060914993
4/29/2018 2:45	5.880686283
4/29/2018 3:00	5.866526604
4/29/2018 3:15	5.866526604
4/29/2018 3:30	5.866526604
4/29/2018 3:45	5.866526604
4/29/2018 4:00	5.866526604
4/29/2018 4:15	5.866526604
4/29/2018 4:30	5.866526604
4/29/2018 4:45	6.142550945
4/29/2018 5:00	6.086822033
4/29/2018 5:15	6.94220686
4/29/2018 5:30	6.94220686
4/29/2018 5:45	6.398810387
4/29/2018 6:00	6.168318748
4/29/2018 6:15	6.059310913
4/29/2018 6:30	8.783764839
4/29/2018 6:45	9.738447189
4/29/2018 7:00	9.738447189
4/29/2018 7:15	10.18621159
4/29/2018 7:30	8.026767731
4/29/2018 7:45	7.950134754
4/29/2018 8:00	7.146167278
4/29/2018 8:15	7.269900799
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4/29/2018 8:45	7.058391094
4/29/2018 9:00	7.953986645
4/29/2018 9:15	34.13142014
4/29/2018 9:30	45.55911636
4/29/2018 9:45	46.27944565
4/29/2018 10:00	46.9866066
4/29/2018 10:15	45.76718903
4/29/2018 10:30	51.27370834
4/29/2018 10:45	0
4/29/2018 11:00	0
4/29/2018 11:15	28.03467751
4/29/2018 11:30	22.82562828
4/29/2018 11:45	25.88938332
4/29/2018 12:00	19.34000397
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4/29/2018 12:30	18.67755699
4/29/2018 12:45	17.85488892
4/29/2018 13:00	79.87825012
4/29/2018 13:15	79.87825012
4/29/2018 13:30	79.87825012
4/29/2018 13:45	10.75156689
4/29/2018 14:00	10.27073479
4/29/2018 14:15	10.39085579
4/29/2018 14:30	10.24370003
4/29/2018 14:45	0
4/29/2018 15:00	0
4/29/2018 15:15	0

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4/29/2018 15:30	39.62174225
4/29/2018 15:45	70.59540558
4/29/2018 16:00	48.86913681
4/29/2018 16:15	65.33195496
4/29/2018 16:30	65.33195496
4/29/2018 16:45	79.15220642
4/29/2018 17:00	78.82047272
4/29/2018 17:15	10.53003216
4/29/2018 17:30	9.161253929
4/29/2018 17:45	8.89323616
4/29/2018 18:00	8.773312569
4/29/2018 18:15	63.80134201
4/29/2018 18:30	64.29714203
4/29/2018 18:45	64.29714203
4/29/2018 19:00	67.37171936
4/29/2018 19:15	0
4/29/2018 19:30	0
4/29/2018 19:45	0
4/29/2018 20:00	37.10428619
4/29/2018 20:15	79.69770813
4/29/2018 20:30	67.82254791
4/29/2018 20:45	88.47547913
4/29/2018 21:00	79.69770813
4/29/2018 21:15	10.07352352
4/29/2018 21:30	8.878363609
4/29/2018 21:45	8.144302368
4/29/2018 22:00	8.144302368
4/29/2018 22:15	0
4/29/2018 22:30	22.58080292
4/29/2018 22:45	43.30391693
4/29/2018 23:00	32.49123001
4/29/2018 23:15	42.92689896
4/29/2018 23:30	43.41299438
4/29/2018 23:45	43.41299438
4/30/2018 0:00	0
4/30/2018 0:15	0
4/30/2018 0:30	0
4/30/2018 0:45	31.45250511
4/30/2018 1:00	62.90501022
4/30/2018 1:15	38.91143799
4/30/2018 1:30	29.83574295
4/30/2018 1:45	30.53505325
4/30/2018 2:00	29.8928566
4/30/2018 2:15	29.50839996
4/30/2018 2:30	30.40928078
4/30/2018 2:45	0
4/30/2018 3:00	0
4/30/2018 3:15	0
4/30/2018 3:30	0
4/30/2018 3:45	0
4/30/2018 4:00	32.96474457
4/30/2018 4:15	61.43013763
4/30/2018 4:30	54.01912689
4/30/2018 4:45	69.56711578
4/30/2018 5:00	69.56711578
4/30/2018 5:15	65.83692932
4/30/2018 5:30	69.94516754
4/30/2018 5:45	69.94516754
4/30/2018 6:00	68.84315491
4/30/2018 6:15	0
4/30/2018 6:30	35.58705902
4/30/2018 6:45	68.39352417
4/30/2018 7:00	52.2952919
4/30/2018 7:15	70.24648285
4/30/2018 7:30	71.14524841
4/30/2018 7:45	75.2283783
4/30/2018 8:00	0
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4/30/2018 8:45	0
4/30/2018 9:00	0
4/30/2018 9:15	0
4/30/2018 9:30	0
4/30/2018 9:45	0
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4/30/2018 10:15	0
4/30/2018 10:30	0
4/30/2018 10:45	0
4/30/2018 11:00	0
4/30/2018 11:15	0
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4/30/2018 11:45	9.014842987
4/30/2018 12:00	22.9456749
4/30/2018 12:15	7.641702652
4/30/2018 12:30	7.238467693
4/30/2018 12:45	6.356284618
4/30/2018 13:00	6.356284618
4/30/2018 13:15	0
4/30/2018 13:30	0
4/30/2018 13:45	0
4/30/2018 14:00	0
4/30/2018 14:15	0
4/30/2018 14:30	0
4/30/2018 14:45	0
4/30/2018 15:00	0
4/30/2018 15:15	0

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4/30/2018 15:30	0
4/30/2018 15:45	0
4/30/2018 16:00	0
4/30/2018 16:15	0
4/30/2018 16:30	24.81796646
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4/30/2018 17:00	49.97350311
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5/2/2018 18:30	47.19763947
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5/4/2018 5:15	49.00489426
5/4/2018 5:30	55.65463638
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5/4/2018 10:15	24.29271507
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5/4/2018 11:45	7.634986401
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5/4/2018 14:45	34.48179626
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5/4/2018 16:15	31.95291138
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5/4/2018 18:45	0
5/4/2018 19:00	0
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5/5/2018 9:00	7.343148232
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5/5/2018 10:45	4.819696903
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5/5/2018 19:15	7.066561222
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5/6/2018 9:00	47.5485878
5/6/2018 9:15	15.46851063
5/6/2018 9:30	8.105053902
5/6/2018 9:45	9.350234032
5/6/2018 10:00	9.19033432
5/6/2018 10:15	10.91322327
5/6/2018 10:30	10.91322327
5/6/2018 10:45	12.70745754
5/6/2018 11:00	11.54646683
5/6/2018 11:15	17.08956528
5/6/2018 11:30	18.67341614
5/6/2018 11:45	12.70745754
5/6/2018 12:00	11.35409832
5/6/2018 12:15	11.35409832
5/6/2018 12:30	11.38634109
5/6/2018 12:45	52.58505249
5/6/2018 13:00	53.57278061
5/6/2018 13:15	52.29922104
5/6/2018 13:30	56.47446442
5/6/2018 13:45	56.47446442
5/6/2018 14:00	66.79629517
5/6/2018 14:15	55.33065414
5/6/2018 14:30	6.316195965
5/6/2018 14:45	6.316195965
5/6/2018 15:00	6.585545063
5/6/2018 15:15	4.952197075

Site 15 – MH 7.05 (South)

5/6/2018 15:30	8.226405144
5/6/2018 15:45	8.567146301
5/6/2018 16:00	8.456585884
5/6/2018 16:15	7.00378418
5/6/2018 16:30	8.27672863
5/6/2018 16:45	7.00378418
5/6/2018 17:00	5.992480278
5/6/2018 17:15	5.992480278
5/6/2018 17:30	7.002214432
5/6/2018 17:45	7.919305801
5/6/2018 18:00	7.59448576
5/6/2018 18:15	7.59448576
5/6/2018 18:30	7.804129601
5/6/2018 18:45	7.706567764
5/6/2018 19:00	11.83515072
5/6/2018 19:15	12.85556412
5/6/2018 19:30	13.88998222
5/6/2018 19:45	12.83830547
5/6/2018 20:00	12.83830547
5/6/2018 20:15	9.484651566
5/6/2018 20:30	8.209677696
5/6/2018 20:45	5.571578026
5/6/2018 21:00	4.47627306
5/6/2018 21:15	0
5/6/2018 21:30	2.825864077
5/6/2018 21:45	3.812176466
5/6/2018 22:00	3.582068682
5/6/2018 22:15	6.061312199
5/6/2018 22:30	6.061312199
5/6/2018 22:45	4.779637814
5/6/2018 23:00	4.761601448
5/6/2018 23:15	28.75384521
5/6/2018 23:30	28.62375259
5/6/2018 23:45	27.34246063
5/7/2018 0:00	27.30727005
5/7/2018 0:15	0
5/7/2018 0:30	0
5/7/2018 0:45	0
5/7/2018 1:00	0
5/7/2018 1:15	0
5/7/2018 1:30	0
5/7/2018 1:45	18.21719551
5/7/2018 2:00	35.49549103
5/7/2018 2:15	25.80639839
5/7/2018 2:30	35.49549103
5/7/2018 2:45	34.77271652
5/7/2018 3:00	33.50162125
5/7/2018 3:15	0
5/7/2018 3:30	0
5/7/2018 3:45	0
5/7/2018 4:00	0
5/7/2018 4:15	4.716852188
5/7/2018 4:30	11.47220612
5/7/2018 4:45	9.488091469
5/7/2018 5:00	11.71605587
5/7/2018 5:15	12.2437191
5/7/2018 5:30	10.69313526
5/7/2018 5:45	10.69313526
5/7/2018 6:00	0
5/7/2018 6:15	23.36238289
5/7/2018 6:30	46.72476578
5/7/2018 6:45	39.32492447
5/7/2018 7:00	39.90651321
5/7/2018 7:15	42.72270584
5/7/2018 7:30	43.71107864
5/7/2018 7:45	45.75990677
5/7/2018 8:00	56.41264343
5/7/2018 8:15	62.89289474
5/7/2018 8:30	63.62747192
5/7/2018 8:45	60.61748505
5/7/2018 9:00	54.10197449
5/7/2018 9:15	7.993070126
5/7/2018 9:30	7.765305042
5/7/2018 9:45	7.06380558
5/7/2018 10:00	7.488920212
5/7/2018 10:15	38.48576355
5/7/2018 10:30	41.25478745
5/7/2018 10:45	41.25478745
5/7/2018 11:00	45.53732681
5/7/2018 11:15	42.58847046
5/7/2018 11:30	14.35157299
5/7/2018 11:45	8.640750885
5/7/2018 12:00	8.640750885
5/7/2018 12:15	9.679959297
5/7/2018 12:30	6.309857368
5/7/2018 12:45	5.775829315
5/7/2018 13:00	6.309857368
5/7/2018 13:15	6.309857368
5/7/2018 13:30	8.157793999
5/7/2018 13:45	12.66092396
5/7/2018 14:00	17.85653877
5/7/2018 14:15	19.34687996
5/7/2018 14:30	32.65654755
5/7/2018 14:45	34.22787476
5/7/2018 15:00	31.25919342
5/7/2018 15:15	31.24652672

Site 15 – MH 7.05 (South)

5/7/2018 15:30	31.30665588
5/7/2018 15:45	38.17175674
5/7/2018 16:00	38.7224884
5/7/2018 16:15	51.64703751
5/7/2018 16:30	52.83469009
5/7/2018 16:45	0
5/7/2018 17:00	0
5/7/2018 17:15	0
5/7/2018 17:30	0
5/7/2018 17:45	0
5/7/2018 18:00	0
5/7/2018 18:15	0
5/7/2018 18:30	0
5/7/2018 18:45	0
5/7/2018 19:00	0
5/7/2018 19:15	0
5/7/2018 19:30	0
5/7/2018 19:45	0
5/7/2018 20:00	0
5/7/2018 20:15	0
5/7/2018 20:30	0
5/7/2018 20:45	0
5/7/2018 21:00	0
5/7/2018 21:15	0
5/7/2018 21:30	0
5/7/2018 21:45	20.63929558
5/7/2018 22:00	43.02413177
5/7/2018 22:15	29.0421524
5/7/2018 22:30	44.19376373
5/7/2018 22:45	44.19376373
5/7/2018 23:00	34.02228165
5/7/2018 23:15	0
5/7/2018 23:30	0
5/7/2018 23:45	0
5/8/2018 0:00	0
5/8/2018 0:15	0
5/8/2018 0:30	0
5/8/2018 0:45	0
5/8/2018 1:00	0
5/8/2018 1:15	0
5/8/2018 1:30	0
5/8/2018 1:45	0
5/8/2018 2:00	0
5/8/2018 2:15	0
5/8/2018 2:30	0
5/8/2018 2:45	0
5/8/2018 3:00	0
5/8/2018 3:15	0
5/8/2018 3:30	0
5/8/2018 3:45	0
5/8/2018 4:00	0
5/8/2018 4:15	3.358561516
5/8/2018 4:30	4.701019287
5/8/2018 4:45	6.527003288
5/8/2018 5:00	7.80714941
5/8/2018 5:15	11.12443638
5/8/2018 5:30	44.17565536
5/8/2018 5:45	43.92437363
5/8/2018 6:00	44.0094986
5/8/2018 6:15	44.1373291
5/8/2018 6:30	44.93038559
5/8/2018 6:45	51.28268433
5/8/2018 7:00	7.69875288
5/8/2018 7:15	8.074118614
5/8/2018 7:30	8.074118614
5/8/2018 7:45	13.35964108
5/8/2018 8:00	23.1095314
5/8/2018 8:15	28.19797707
5/8/2018 8:30	31.97774315
5/8/2018 8:45	36.20832825
5/8/2018 9:00	27.29018974
5/8/2018 9:15	9.856981277
5/8/2018 9:30	9.56492424
5/8/2018 9:45	9.56492424
5/8/2018 10:00	10.95751762
5/8/2018 10:15	12.87239742
5/8/2018 10:30	12.87239742
5/8/2018 10:45	12.91568947
5/8/2018 11:00	11.04517841
5/8/2018 11:15	9.976269722
5/8/2018 11:30	9.976269722
5/8/2018 11:45	9.175854683
5/8/2018 12:00	9.175854683
5/8/2018 12:15	11.2955637
5/8/2018 12:30	12.04853249
5/8/2018 12:45	12.04853249
5/8/2018 13:00	10.68150616
5/8/2018 13:15	8.996007919
5/8/2018 13:30	6.873208523
5/8/2018 13:45	6.555519104
5/8/2018 14:00	6.743902683
5/8/2018 14:15	6.743902683
5/8/2018 14:30	0
5/8/2018 14:45	0
5/8/2018 15:00	17.78900528
5/8/2018 15:15	33.78382874

Site 15 – MH 7.05 (South)

5/8/2018 15:30	27.28992844
5/8/2018 15:45	35.57801056
5/8/2018 16:00	38.94535446
5/8/2018 16:15	38.10815048
5/8/2018 16:30	0
5/8/2018 16:45	0
5/8/2018 17:00	0
5/8/2018 17:15	0
5/8/2018 17:30	2.436087608
5/8/2018 17:45	4.669187069
5/8/2018 18:00	5.214828491
5/8/2018 18:15	6.921046734
5/8/2018 18:30	8.191222191
5/8/2018 18:45	8.946798325
5/8/2018 19:00	8.946798325
5/8/2018 19:15	7.893359661
5/8/2018 19:30	8.136293411
5/8/2018 19:45	47.22309113
5/8/2018 20:00	47.22309113
5/8/2018 20:15	47.22309113
5/8/2018 20:30	6.626127243
5/8/2018 20:45	6.137804508
5/8/2018 21:00	6.137804508
5/8/2018 21:15	5.962790489
5/8/2018 21:30	5.899391174
5/8/2018 21:45	5.400476933
5/8/2018 22:00	4.976034641
5/8/2018 22:15	4.34719038
5/8/2018 22:30	0
5/8/2018 22:45	2.339007616
5/8/2018 23:00	5.205526352
5/8/2018 23:15	10.47434711
5/8/2018 23:30	6.457404613
5/8/2018 23:45	24.62837982
5/9/2018 0:00	27.55155563
5/9/2018 0:15	27.5063324
5/9/2018 0:30	35.1033783
5/9/2018 0:45	36.2673645
5/9/2018 1:00	36.10282135
5/9/2018 1:15	35.68058777
5/9/2018 1:30	0
5/9/2018 1:45	0
5/9/2018 2:00	0
5/9/2018 2:15	0
5/9/2018 2:30	12.20500946
5/9/2018 2:45	8.366256714
5/9/2018 3:00	9.724022865
5/9/2018 3:15	7.102938652
5/9/2018 3:30	7.102938652
5/9/2018 3:45	7.019659996
5/9/2018 4:00	5.939653873
5/9/2018 4:15	6.010119438
5/9/2018 4:30	33.72909164
5/9/2018 4:45	39.16488266
5/9/2018 5:00	47.20414352
5/9/2018 5:15	44.46054077
5/9/2018 5:30	43.12686157
5/9/2018 5:45	43.79076004
5/9/2018 6:00	45.14496994
5/9/2018 6:15	49.47406387
5/9/2018 6:30	47.81534958
5/9/2018 6:45	10.38385963
5/9/2018 7:00	10.1650753
5/9/2018 7:15	8.929743767
5/9/2018 7:30	5.614164829
5/9/2018 7:45	4.995308399
5/9/2018 8:00	4.995308399
5/9/2018 8:15	4.995308399
5/9/2018 8:30	0
5/9/2018 8:45	0
5/9/2018 9:00	7.89384079
5/9/2018 9:15	7.711977005
5/9/2018 9:30	9.414345741
5/9/2018 9:45	7.048614025
5/9/2018 10:00	7.210862637
5/9/2018 10:15	5.34733963
5/9/2018 10:30	6.740219116
5/9/2018 10:45	6.740219116
5/9/2018 11:00	10.58144474
5/9/2018 11:15	10.58144474
5/9/2018 11:30	12.08789253
5/9/2018 11:45	10.76320553
5/9/2018 12:00	8.073314667
5/9/2018 12:15	5.779249191
5/9/2018 12:30	6.11633873
5/9/2018 12:45	5.779249191
5/9/2018 13:00	5.779249191
5/9/2018 13:15	6.11633873
5/9/2018 13:30	7.239428043
5/9/2018 13:45	13.12662983
5/9/2018 14:00	14.85528278
5/9/2018 14:15	22.05777931
5/9/2018 14:30	22.21121597
5/9/2018 14:45	22.05777931
5/9/2018 15:00	20.31277084
5/9/2018 15:15	20.21290398

5/9/2018 15:30	16.88056183
5/9/2018 15:45	16.76820564
5/9/2018 16:00	15.24765587
5/9/2018 16:15	14.29438686
5/9/2018 16:30	14.44481659
5/9/2018 16:45	25.64297295
5/9/2018 17:00	27.26400375
5/9/2018 17:15	26.28475189
5/9/2018 17:30	25.45804596
5/9/2018 17:45	0
5/9/2018 18:00	0
5/9/2018 18:15	0
5/9/2018 18:30	0
5/9/2018 18:45	3.987840176
5/9/2018 19:00	3.670853138
5/9/2018 19:15	5.938214779
5/9/2018 19:30	8.458850861
5/9/2018 19:45	8.458850861
5/9/2018 20:00	8.275743484
5/9/2018 20:15	9.227231979
5/9/2018 20:30	8.256033897
5/9/2018 20:45	6.294557571
5/9/2018 21:00	0
5/9/2018 21:15	0
5/9/2018 21:30	0
5/9/2018 21:45	0
5/9/2018 22:00	0
5/9/2018 22:15	0
5/9/2018 22:30	0
5/9/2018 22:45	0
5/9/2018 23:00	0
5/9/2018 23:15	0
5/9/2018 23:30	0
5/9/2018 23:45	0
5/10/2018 0:00	0
5/10/2018 0:15	0
5/10/2018 0:30	0
5/10/2018 0:45	0
5/10/2018 1:00	0
5/10/2018 1:15	0
5/10/2018 1:30	0
5/10/2018 1:45	0
5/10/2018 2:00	0
5/10/2018 2:15	0
5/10/2018 2:30	0
5/10/2018 2:45	0
5/10/2018 3:00	0
5/10/2018 3:15	0
5/10/2018 3:30	0
5/10/2018 3:45	0
5/10/2018 4:00	0
5/10/2018 4:15	45.59379196
5/10/2018 4:30	96.3079071
5/10/2018 4:45	82.50069427
5/10/2018 5:00	105.5044632
5/10/2018 5:15	105.5044632
5/10/2018 5:30	26.89268494
5/10/2018 5:45	9.655477524
5/10/2018 6:00	8.809809685
5/10/2018 6:15	8.701940536
5/10/2018 6:30	8.701940536
5/10/2018 6:45	8.778795242
5/10/2018 7:00	9.026758194
5/10/2018 7:15	10.82267666
5/10/2018 7:30	11.99507904
5/10/2018 7:45	11.82865429
5/10/2018 8:00	10.99369907
5/10/2018 8:15	9.414531708
5/10/2018 8:30	9.519968033
5/10/2018 8:45	9.519968033
5/10/2018 9:00	9.342813492
5/10/2018 9:15	15.64707184
5/10/2018 9:30	15.64707184
5/10/2018 9:45	15.64707184
5/10/2018 10:00	12.02920914
5/10/2018 10:15	18.86965942
5/10/2018 10:30	61.22746658
5/10/2018 10:45	61.22746658
5/10/2018 11:00	61.22746658
5/10/2018 11:15	11.29634666
5/10/2018 11:30	11.55002785
5/10/2018 11:45	10.6031456
5/10/2018 12:00	10.6400671
5/10/2018 12:15	10.6400671
5/10/2018 12:30	0
5/10/2018 12:45	0
5/10/2018 13:00	0
5/10/2018 13:15	0
5/10/2018 13:30	0
5/10/2018 13:45	0
5/10/2018 14:00	0
5/10/2018 14:15	4.501907825
5/10/2018 14:30	6.260769367
5/10/2018 14:45	5.833008289
5/10/2018 15:00	8.630739212
5/10/2018 15:15	9.023792267

Site 15 – MH 7.05 (South)

5/10/2018 15:30	8.393828392
5/10/2018 15:45	8.90237999
5/10/2018 16:00	8.974158287
5/10/2018 16:15	0
5/10/2018 16:30	0
5/10/2018 16:45	6.362847805
5/10/2018 17:00	11.65877628
5/10/2018 17:15	10.23537731
5/10/2018 17:30	14.22929859
5/10/2018 17:45	14.22929859
5/10/2018 18:00	13.63208675
5/10/2018 18:15	0
5/10/2018 18:30	0
5/10/2018 18:45	5.989856243
5/10/2018 19:00	8.340251923
5/10/2018 19:15	7.829667568
5/10/2018 19:30	8.193627357
5/10/2018 19:45	8.057128906
5/10/2018 20:00	8.057128906
5/10/2018 20:15	10.55333042
5/10/2018 20:30	9.142094612
5/10/2018 20:45	9.142094612
5/10/2018 21:00	10.48705101
5/10/2018 21:15	9.080453873
5/10/2018 21:30	9.080453873
5/10/2018 21:45	8.856074333
5/10/2018 22:00	9.477099419
5/10/2018 22:15	12.19559002
5/10/2018 22:30	15.16177273
5/10/2018 22:45	12.76770115
5/10/2018 23:00	13.43515587
5/10/2018 23:15	13.86417007
5/10/2018 23:30	9.202833176
5/10/2018 23:45	9.014399529
5/11/2018 0:00	9.014399529
5/11/2018 0:15	9.014399529
5/11/2018 0:30	9.716738701
5/11/2018 0:45	8.572509766
5/11/2018 1:00	9.230051994
5/11/2018 1:15	8.291629791
5/11/2018 1:30	8.291629791
5/11/2018 1:45	9.186897278
5/11/2018 2:00	6.623838902
5/11/2018 2:15	9.897133827
5/11/2018 2:30	10.4376421
5/11/2018 2:45	10.4376421
5/11/2018 3:00	7.35060215
5/11/2018 3:15	11.12208748
5/11/2018 3:30	11.48403835
5/11/2018 3:45	10.32237244
5/11/2018 4:15	12.46592426
5/11/2018 4:30	11.46748543
5/11/2018 4:45	5.726994038
5/11/2018 5:15	13.89815617
5/11/2018 5:30	14.36455631
5/11/2018 5:45	14.25643826
5/11/2018 6:00	13.41119766
5/11/2018 6:15	13.318964
5/11/2018 6:45	0
5/11/2018 7:00	0
5/11/2018 7:15	0
5/11/2018 7:30	0
5/11/2018 7:45	4.040935516
5/11/2018 8:00	6.279504776
5/11/2018 8:15	5.126213074
5/11/2018 8:30	7.080257893
5/11/2018 8:45	6.832417965
5/11/2018 9:00	6.832417965
5/11/2018 9:15	7.521165371
5/11/2018 9:30	10.34982109
5/11/2018 9:45	0

Site 16 – MH 26.01 Flow Meter Data

Inst Time	Flow (gpm)
5/11/2018 11:15	0
5/11/2018 11:30	4.090263844
5/11/2018 11:45	5.180502892
5/11/2018 12:00	6.998116493
5/11/2018 12:15	10.74769115
5/11/2018 12:30	10.74769115
5/11/2018 12:45	8.163797379
5/11/2018 13:00	8.163797379
5/11/2018 13:15	8.05715847
5/11/2018 13:30	7.444787979
5/11/2018 13:45	7.668458939
5/11/2018 14:00	7.540467739
5/11/2018 14:15	6.854961872
5/11/2018 14:30	6.352752209
5/11/2018 14:45	7.000313759
5/11/2018 15:00	7.000313759
5/11/2018 15:15	7.21184063
5/11/2018 15:30	7.21184063
5/11/2018 15:45	7.21184063
5/11/2018 16:00	5.342632771
5/11/2018 16:15	5.342632771
5/11/2018 16:30	5.342632771
5/11/2018 16:45	5.389408112
5/11/2018 17:00	6.372515202
5/11/2018 17:15	7.189574718
5/11/2018 17:30	6.290570736
5/11/2018 17:45	5.58959198
5/11/2018 18:00	6.306268215
5/11/2018 18:15	7.097123623
5/11/2018 18:30	5.321708679
5/11/2018 18:45	5.340313911
5/11/2018 19:00	5.528740406
5/11/2018 19:15	5.131736279
5/11/2018 19:30	4.577244759
5/11/2018 19:45	4.58451128
5/11/2018 20:00	4.659621239
5/11/2018 20:15	4.810958862
5/11/2018 20:30	6.295443535
5/11/2018 20:45	11.11808777
5/11/2018 21:00	15.29432678
5/11/2018 21:15	15.29432678
5/11/2018 21:30	15.25479317
5/11/2018 21:45	12.49961472
5/11/2018 22:00	11.87916946
5/11/2018 22:15	10.48791504
5/11/2018 22:30	10.48791504
5/11/2018 22:45	10.04424572
5/11/2018 23:00	7.816799641
5/11/2018 23:15	7.213387012
5/11/2018 23:30	7.103580952
5/11/2018 23:45	7.103580952
5/12/2018 0:00	6.7771492
5/12/2018 0:15	6.172467709
5/12/2018 0:30	6.172467709
5/12/2018 0:45	8.82065773
5/12/2018 1:00	8.790369987
5/12/2018 1:15	9.558041573
5/12/2018 1:30	8.997868538
5/12/2018 1:45	9.558041573
5/12/2018 2:00	9.53758812
5/12/2018 2:15	8.853764534
5/12/2018 2:30	6.712461948
5/12/2018 2:45	6.762754917
5/12/2018 3:00	8.932292938
5/12/2018 3:15	8.956887245
5/12/2018 3:30	8.956887245
5/12/2018 3:45	9.332943916
5/12/2018 4:00	8.956887245
5/12/2018 4:15	10.03332615
5/12/2018 4:30	9.332943916
5/12/2018 4:45	9.332943916
5/12/2018 5:00	9.245498657
5/12/2018 5:15	9.332943916
5/12/2018 5:30	8.093707085
5/12/2018 5:45	18.61402512
5/12/2018 6:00	17.13201714
5/12/2018 6:15	15.65000916
5/12/2018 6:30	13.04921341
5/12/2018 6:45	10.83082294
5/12/2018 7:00	9.678606987
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5/12/2018 7:45	10.42152309
5/12/2018 8:00	10.56128597
5/12/2018 8:15	11.01755142
5/12/2018 8:30	11.01755142
5/12/2018 8:45	10.70157433
5/12/2018 9:00	11.25132751
5/12/2018 9:15	13.56627846
5/12/2018 9:30	13.56627846
5/12/2018 9:45	17.37290955
5/12/2018 10:00	16.25238037
5/12/2018 10:15	14.98926258
5/12/2018 10:30	13.76040936
5/12/2018 10:45	12.35549545

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5/12/2018 11:30	12.52381039
5/12/2018 11:45	12.69369793
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5/12/2018 12:30	13.36039829
5/12/2018 12:45	13.36039829
5/12/2018 13:00	11.23219299
5/12/2018 13:15	11.69132042
5/12/2018 13:30	13.12393188
5/12/2018 13:45	11.69132042
5/12/2018 14:00	11.50611591
5/12/2018 14:15	12.1649971
5/12/2018 14:30	13.43972111
5/12/2018 14:45	17.8147068
5/12/2018 15:00	17.58455467
5/12/2018 15:15	17.58455467
5/12/2018 15:30	10.96872234
5/12/2018 15:45	10.96872234
5/12/2018 16:00	10.85718155
5/12/2018 16:15	11.48011112
5/12/2018 16:30	13.18320847
5/12/2018 16:45	13.18320847
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5/12/2018 17:30	13.17847538
5/12/2018 17:45	12.91509628
5/12/2018 18:00	10.65606403
5/12/2018 18:15	10.65606403
5/12/2018 18:30	10.36867237
5/12/2018 18:45	9.097306252
5/12/2018 19:00	10.36867237
5/12/2018 19:15	13.97900486
5/12/2018 19:30	13.78829861
5/12/2018 19:45	13.85301113
5/12/2018 20:00	14.42450142
5/12/2018 20:15	10.99572659
5/12/2018 20:30	10.99572659
5/12/2018 20:45	10.99572659
5/12/2018 21:00	10.92530918
5/12/2018 21:15	10.49245453
5/12/2018 21:30	10.49245453
5/12/2018 21:45	10.92530918
5/12/2018 22:00	11.65788174
5/12/2018 22:15	12.73463917
5/12/2018 22:30	13.23115921
5/12/2018 22:45	12.88746452
5/12/2018 23:00	12.73463917
5/12/2018 23:15	12.73463917
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5/12/2018 23:45	10.12373257
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5/13/2018 0:30	7.670539379
5/13/2018 0:45	7.338059425
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5/13/2018 1:30	7.559226513
5/13/2018 1:45	6.532290936
5/13/2018 2:00	6.83144474
5/13/2018 2:15	8.93856144
5/13/2018 2:30	9.741709709
5/13/2018 2:45	10.67949104
5/13/2018 3:00	10.67949104
5/13/2018 3:15	10.22125435
5/13/2018 3:30	9.598893166
5/13/2018 3:45	6.562273502
5/13/2018 4:00	6.187652111
5/13/2018 4:15	8.921180725
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5/13/2018 5:00	7.177942276
5/13/2018 5:15	8.573954582
5/13/2018 5:30	7.847064495
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5/13/2018 6:15	12.91035271
5/13/2018 6:30	10.43409061
5/13/2018 6:45	11.71352959
5/13/2018 7:00	11.83899117
5/13/2018 7:15	11.28829765
5/13/2018 7:30	11.28829765
5/13/2018 7:45	11.83899117
5/13/2018 8:00	10.64313221
5/13/2018 8:15	12.46353817
5/13/2018 8:30	18.33588028
5/13/2018 8:45	18.33311272
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5/13/2018 9:15	16.63099861
5/13/2018 9:30	16.21729279
5/13/2018 9:45	15.9241991
5/13/2018 10:00	15.9241991
5/13/2018 10:15	16.5346508
5/13/2018 10:30	21.4839325
5/13/2018 10:45	22.28562164

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5/13/2018 11:30	10.78241253
5/13/2018 11:45	10.55837822
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5/13/2018 12:45	11.79415894
5/13/2018 13:00	10.29709244
5/13/2018 13:15	11.91907406
5/13/2018 13:30	12.06920815
5/13/2018 13:45	12.23104668
5/13/2018 14:00	12.35373592
5/13/2018 14:15	12.35373592
5/13/2018 14:30	15.25226784
5/13/2018 14:45	13.86028862
5/13/2018 15:00	13.86028862
5/13/2018 15:15	13.46450043
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5/13/2018 15:45	13.46450043
5/13/2018 16:00	11.52834797
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5/13/2018 18:30	9.667902946
5/13/2018 18:45	10.67189217
5/13/2018 19:00	11.65152073
5/13/2018 19:15	11.80519295
5/13/2018 19:30	12.29274178
5/13/2018 19:45	12.80953121
5/13/2018 20:00	13.94928551
5/13/2018 20:15	14.72563934
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5/13/2018 20:45	13.71509838
5/13/2018 21:00	11.58689499
5/13/2018 21:15	10.72363949
5/13/2018 21:30	9.319890022
5/13/2018 21:45	9.190229416
5/13/2018 22:00	9.190229416
5/13/2018 22:15	8.93253994
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5/13/2018 22:45	9.762183189
5/13/2018 23:00	10.33959293
5/13/2018 23:15	10.19434547
5/13/2018 23:30	8.486943245
5/13/2018 23:45	8.973670006
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5/14/2018 0:45	9.810705185
5/14/2018 1:00	7.975551605
5/14/2018 1:15	7.113892078
5/14/2018 1:30	7.113892078
5/14/2018 1:45	7.113892078
5/14/2018 2:00	8.982860565
5/14/2018 2:15	8.982860565
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5/14/2018 4:30	6.588363171
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5/14/2018 5:00	6.449486256
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5/14/2018 5:30	6.449486256
5/14/2018 5:45	6.926097393
5/14/2018 6:00	8.8397789
5/14/2018 6:15	9.829969406
5/14/2018 6:30	9.989812851
5/14/2018 6:45	11.55843163
5/14/2018 7:00	10.56722641
5/14/2018 7:15	11.55843163
5/14/2018 7:30	10.92539597
5/14/2018 7:45	10.92539597
5/14/2018 8:00	15.18380642
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5/14/2018 9:45	8.951372147
5/14/2018 10:00	11.75849056
5/14/2018 10:15	11.75849056
5/14/2018 10:30	14.8659277
5/14/2018 10:45	14.61549664

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5/14/2018 11:30	16.62099648
5/14/2018 11:45	16.41711426
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5/14/2018 12:15	15.62154865
5/14/2018 12:30	13.29846573
5/14/2018 12:45	12.94512272
5/14/2018 13:00	10.78064442
5/14/2018 13:15	10.63438892
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5/14/2018 13:45	10.63438892
5/14/2018 14:00	10.63438892
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5/14/2018 14:45	8.011316299
5/14/2018 15:00	8.598964691
5/14/2018 15:15	10.13548279
5/14/2018 15:30	10.13548279
5/14/2018 15:45	12.65606499
5/14/2018 16:00	15.95436287
5/14/2018 16:15	15.95436287
5/14/2018 16:30	15.34163475
5/14/2018 16:45	15.95436287
5/14/2018 17:00	15.99758911
5/14/2018 17:15	10.66722965
5/14/2018 17:30	10.83180714
5/14/2018 17:45	11.81393242
5/14/2018 18:00	12.42142105
5/14/2018 18:15	12.42142105
5/14/2018 18:30	17.25616455
5/14/2018 18:45	16.3062973
5/14/2018 19:00	16.09203339
5/14/2018 19:15	15.48295021
5/14/2018 19:30	12.61631966
5/14/2018 19:45	11.62663937
5/14/2018 20:00	11.1316328
5/14/2018 20:15	10.25901699
5/14/2018 20:30	10.25901699
5/14/2018 20:45	10.97645855
5/14/2018 21:00	9.867768288
5/14/2018 21:15	10.97645855
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5/14/2018 22:15	12.18089485
5/14/2018 22:30	8.759508133
5/14/2018 22:45	9.344587326
5/14/2018 23:00	9.344587326
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5/14/2018 23:45	9.616496086
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5/15/2018 0:15	7.707809925
5/15/2018 0:30	7.707809925
5/15/2018 0:45	5.622627735
5/15/2018 1:00	5.622627735
5/15/2018 1:15	5.622627735
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5/15/2018 1:45	8.007853508
5/15/2018 2:00	7.888438702
5/15/2018 2:15	7.754027843
5/15/2018 2:30	7.518352032
5/15/2018 2:45	6.609893799
5/15/2018 3:00	6.921400547
5/15/2018 3:15	6.921400547
5/15/2018 3:30	6.921400547
5/15/2018 3:45	7.026176453
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5/15/2018 4:15	7.096680641
5/15/2018 4:30	7.468767643
5/15/2018 4:45	7.749213219
5/15/2018 5:00	8.284029007
5/15/2018 5:15	7.749213219
5/15/2018 5:30	8.525255203
5/15/2018 5:45	8.887070656
5/15/2018 6:00	9.403943062
5/15/2018 6:15	9.97155571
5/15/2018 6:30	12.74518871
5/15/2018 6:45	14.62288284
5/15/2018 7:00	15.09951115
5/15/2018 7:15	15.09951115
5/15/2018 7:30	13.84004211
5/15/2018 7:45	13.84004211
5/15/2018 8:00	11.04966259
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5/15/2018 8:30	11.7891655
5/15/2018 8:45	12.06671619
5/15/2018 9:00	11.3008709
5/15/2018 9:15	11.45437336
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5/15/2018 9:45	10.42993069
5/15/2018 10:00	9.227078438
5/15/2018 10:15	11.47391605
5/15/2018 10:30	11.47391605
5/15/2018 10:45	11.81914234

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5/15/2018 11:15	14.34248638
5/15/2018 11:30	16.95861244
5/15/2018 11:45	16.32651901
5/15/2018 12:00	8.938102722
5/15/2018 12:15	8.561394691
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5/15/2018 12:45	8.024276733
5/15/2018 13:00	10.29507256
5/15/2018 13:15	11.44190121
5/15/2018 13:30	13.88902855
5/15/2018 13:45	14.59305
5/15/2018 14:00	14.59305
5/15/2018 14:15	13.88902855
5/15/2018 14:30	8.071434021
5/15/2018 14:45	6.506902695
5/15/2018 15:00	6.506902695
5/15/2018 15:15	7.864750385
5/15/2018 15:30	7.490085125
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5/15/2018 18:30	11.40566826
5/15/2018 18:45	11.0858593
5/15/2018 19:00	11.98011208
5/15/2018 19:15	11.89037323
5/15/2018 19:30	11.34274197
5/15/2018 19:45	12.32829857
5/15/2018 20:00	11.34274197
5/15/2018 20:15	11.14707088
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5/15/2018 20:45	10.72043228
5/15/2018 21:00	11.14707088
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5/15/2018 22:00	10.89874649
5/15/2018 22:15	10.56028557
5/15/2018 22:30	9.581171036
5/15/2018 22:45	9.37288475
5/15/2018 23:00	9.37288475
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5/15/2018 23:30	7.825683594
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5/16/2018 0:15	9.964733124
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5/16/2018 0:45	10.37435246
5/16/2018 1:00	10.51193905
5/16/2018 1:15	8.50138855
5/16/2018 1:30	7.949296951
5/16/2018 1:45	7.648611069
5/16/2018 2:00	7.648611069
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5/16/2018 3:00	8.151634216
5/16/2018 3:15	8.499610901
5/16/2018 3:30	8.743894577
5/16/2018 3:45	8.151634216
5/16/2018 4:00	7.810737133
5/16/2018 4:15	7.738759518
5/16/2018 4:30	7.738759518
5/16/2018 4:45	9.399686813
5/16/2018 5:00	9.006596565
5/16/2018 5:15	8.32347393
5/16/2018 5:30	9.006596565
5/16/2018 5:45	9.531809807
5/16/2018 6:00	10.49895477
5/16/2018 6:15	10.49895477
5/16/2018 6:30	10.9626236
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5/16/2018 7:00	11.50567341
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5/16/2018 7:30	12.59694004
5/16/2018 7:45	13.9619875
5/16/2018 8:00	15.97400856
5/16/2018 8:15	16.2139225
5/16/2018 8:30	15.97400856
5/16/2018 8:45	13.77073574
5/16/2018 9:00	15.1171999
5/16/2018 9:15	12.7246294
5/16/2018 9:30	12.2993536
5/16/2018 9:45	12.7246294
5/16/2018 10:00	12.46850681
5/16/2018 10:15	12.2993536
5/16/2018 10:30	11.77163506
5/16/2018 10:45	13.30995369

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5/16/2018 11:15	11.86095142
5/16/2018 11:30	8.013596535
5/16/2018 11:45	11.86095142
5/16/2018 12:00	8.130894661
5/16/2018 12:15	8.170227051
5/16/2018 12:30	8.170227051
5/16/2018 12:45	8.566960335
5/16/2018 13:00	9.184978485
5/16/2018 13:15	9.184978485
5/16/2018 13:30	8.299503326
5/16/2018 13:45	8.828725815
5/16/2018 14:00	8.337473869
5/16/2018 14:15	8.215958595
5/16/2018 14:30	8.215958595
5/16/2018 14:45	10.73947906
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5/16/2018 15:15	11.17377853
5/16/2018 15:30	14.58253384
5/16/2018 15:45	16.21123314
5/16/2018 16:00	15.73677826
5/16/2018 16:15	15.73677826
5/16/2018 16:30	14.14836884
5/16/2018 16:45	14.00951958
5/16/2018 17:00	14.00951958
5/16/2018 17:15	14.00951958
5/16/2018 17:30	14.50904751
5/16/2018 17:45	13.74689865
5/16/2018 18:00	13.74689865
5/16/2018 18:15	13.71971226
5/16/2018 18:30	11.44384003
5/16/2018 18:45	9.216874123
5/16/2018 19:00	11.44384003
5/16/2018 19:15	13.95555687
5/16/2018 19:30	12.75048447
5/16/2018 19:45	12.89603806
5/16/2018 20:00	12.75048447
5/16/2018 20:15	11.62882042
5/16/2018 20:30	11.62882042
5/16/2018 20:45	11.62882042
5/16/2018 21:00	11.62882042
5/16/2018 21:15	13.78264523
5/16/2018 21:30	13.78264523
5/16/2018 21:45	13.1876173
5/16/2018 22:00	11.66876793
5/16/2018 22:15	10.75910282
5/16/2018 22:30	10.10939789
5/16/2018 22:45	9.211455345
5/16/2018 23:00	9.211455345
5/16/2018 23:15	9.341197968
5/16/2018 23:30	7.824802399
5/16/2018 23:45	7.832093239
5/17/2018 0:00	7.780045509
5/17/2018 0:15	7.780045509
5/17/2018 0:30	7.564371586
5/17/2018 0:45	7.564371586
5/17/2018 1:00	7.457203865
5/17/2018 1:15	8.83975029
5/17/2018 1:30	8.587285995
5/17/2018 1:45	8.33699131
5/17/2018 2:00	8.437300682
5/17/2018 2:15	8.33699131
5/17/2018 2:30	8.12907505
5/17/2018 2:45	8.787436485
5/17/2018 3:00	9.336060524
5/17/2018 3:15	9.336060524
5/17/2018 3:30	9.198796272
5/17/2018 3:45	9.712956429
5/17/2018 4:00	9.606219292
5/17/2018 4:15	8.408028603
5/17/2018 4:30	7.884069443
5/17/2018 4:45	8.28866291
5/17/2018 5:00	8.051423073
5/17/2018 5:15	8.797474861
5/17/2018 5:30	9.624402046
5/17/2018 5:45	12.02773666
5/17/2018 6:00	10.6066885
5/17/2018 6:15	12.48771
5/17/2018 6:30	12.48771
5/17/2018 6:45	11.88273335
5/17/2018 7:00	11.88273335
5/17/2018 7:15	12.32048798
5/17/2018 7:30	13.82018471
5/17/2018 7:45	13.82018471
5/17/2018 8:00	13.82018471
5/17/2018 8:15	10.10933971
5/17/2018 8:30	9.263221741
5/17/2018 8:45	8.885452271
5/17/2018 9:00	9.425034523
5/17/2018 9:15	15.16995144
5/17/2018 9:30	15.6077919
5/17/2018 9:45	16.04930687
5/17/2018 10:00	16.27136612
5/17/2018 10:15	12.30010223
5/17/2018 10:30	12.1322403
5/17/2018 10:45	12.2794838

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5/17/2018 11:15	12.2794838
5/17/2018 11:30	12.2794838
5/17/2018 11:45	11.24740314
5/17/2018 12:00	11.73436451
5/17/2018 12:15	11.73436451
5/17/2018 12:30	11.55158329
5/17/2018 12:45	11.24740314
5/17/2018 13:00	9.029453278
5/17/2018 13:15	9.029453278
5/17/2018 13:30	9.029453278
5/17/2018 13:45	12.91224003
5/17/2018 14:00	12.91224003
5/17/2018 14:15	12.21013546
5/17/2018 14:30	11.00477505
5/17/2018 14:45	9.347603798
5/17/2018 15:00	9.485319138
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5/17/2018 15:30	9.623626709
5/17/2018 15:45	10.41915989
5/17/2018 16:00	11.15481853
5/17/2018 16:15	13.10309982
5/17/2018 16:30	14.1932354
5/17/2018 16:45	14.1932354
5/17/2018 17:00	11.97986221
5/17/2018 17:15	15.61629295
5/17/2018 17:30	15.61629295
5/17/2018 17:45	12.45006657
5/17/2018 18:00	12.11157036
5/17/2018 18:15	11.94334984
5/17/2018 18:30	11.94334984
5/17/2018 18:45	11.94334984
5/17/2018 19:00	12.44620991
5/17/2018 19:15	12.97426224
5/17/2018 19:30	13.32983017
5/17/2018 19:45	12.97904587
5/17/2018 20:00	11.74331379
5/17/2018 20:15	11.42403316
5/17/2018 20:30	12.28936863
5/17/2018 20:45	10.92080688
5/17/2018 21:00	11.37880039
5/17/2018 21:15	15.29458046
5/17/2018 21:30	13.0175972
5/17/2018 21:45	12.77693272
5/17/2018 22:00	11.58248711
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5/17/2018 22:45	11.58248711
5/17/2018 23:00	10.65330887
5/17/2018 23:15	8.850686073
5/17/2018 23:30	8.850686073
5/17/2018 23:45	7.69937706
5/18/2018 0:00	7.151297569
5/18/2018 0:15	8.74405098
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5/18/2018 1:00	8.619915962
5/18/2018 1:15	8.619915962
5/18/2018 1:30	8.191613197
5/18/2018 1:45	8.191613197
5/18/2018 2:00	7.778948784
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5/18/2018 2:30	8.074131966
5/18/2018 2:45	8.026227951
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5/18/2018 4:30	8.513504982
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5/18/2018 5:00	8.339232445
5/18/2018 5:15	8.339232445
5/18/2018 5:30	9.126674652
5/18/2018 5:45	10.67831516
5/18/2018 6:00	14.05860233
5/18/2018 6:15	14.07773876
5/18/2018 6:30	13.48960114
5/18/2018 6:45	13.30146313
5/18/2018 7:00	10.81620979
5/18/2018 7:15	10.97685432
5/18/2018 7:30	10.97685432
5/18/2018 7:45	10.96768093
5/18/2018 8:00	10.96768093
5/18/2018 8:15	11.13105392
5/18/2018 8:30	14.42987537
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5/18/2018 9:30	13.6375494
5/18/2018 9:45	13.6375494
5/18/2018 10:00	12.62682438
5/18/2018 10:15	19.0347538
5/18/2018 10:30	19.0347538
5/18/2018 10:45	16.63825226

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5/18/2018 11:15	15.10867596
5/18/2018 11:30	10.64188099
5/18/2018 11:45	13.59892654
5/18/2018 12:00	11.97352219
5/18/2018 12:15	10.94660759
5/18/2018 12:30	8.875102043
5/18/2018 12:45	11.80977631
5/18/2018 13:00	8.757286072
5/18/2018 13:15	8.757286072
5/18/2018 13:30	12.39288616
5/18/2018 13:45	12.56643677
5/18/2018 14:00	10.09573936
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5/18/2018 17:30	11.93169689
5/18/2018 17:45	11.93169689
5/18/2018 18:00	11.93169689
5/18/2018 18:15	11.73384762
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5/18/2018 19:15	9.802809715
5/18/2018 19:30	9.802809715
5/18/2018 19:45	13.20779705
5/18/2018 20:00	13.20779705
5/18/2018 20:15	13.20779705
5/18/2018 20:30	8.402407646
5/18/2018 20:45	7.900815964
5/18/2018 21:00	7.900815964
5/18/2018 21:15	8.402407646
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5/18/2018 21:45	10.00212574
5/18/2018 22:00	10.00212574
5/18/2018 22:15	9.015033722
5/18/2018 22:30	8.533036232
5/18/2018 22:45	8.533036232
5/18/2018 23:00	8.65901947
5/18/2018 23:15	9.148133278
5/18/2018 23:30	9.704896927
5/18/2018 23:45	12.89759922
5/19/2018 0:00	13.27532101
5/19/2018 0:15	11.04506683
5/19/2018 0:30	14.21773529
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5/19/2018 1:00	12.22540951
5/19/2018 1:15	12.0493269
5/19/2018 1:30	11.69945049
5/19/2018 1:45	7.654083252
5/19/2018 2:00	7.654083252
5/19/2018 2:15	7.359695911
5/19/2018 2:30	7.654083252
5/19/2018 2:45	7.752213478
5/19/2018 3:00	7.84260273
5/19/2018 3:15	8.07963562
5/19/2018 3:30	8.07963562
5/19/2018 3:45	7.960852623
5/19/2018 4:00	8.009829521
5/19/2018 4:15	7.91601181
5/19/2018 4:30	7.91601181
5/19/2018 4:45	7.24248457
5/19/2018 5:00	7.134905338
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5/19/2018 5:30	9.383244514
5/19/2018 5:45	10.70038509
5/19/2018 6:00	11.3657217
5/19/2018 6:15	11.3657217
5/19/2018 6:30	10.55375862
5/19/2018 6:45	9.360266685
5/19/2018 7:00	9.360266685
5/19/2018 7:15	7.395269394
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5/19/2018 8:30	9.761429787
5/19/2018 8:45	10.38398743
5/19/2018 9:00	11.94083023
5/19/2018 9:15	11.94083023
5/19/2018 9:30	11.94083023
5/19/2018 9:45	11.98385048
5/19/2018 10:00	11.04457474
5/19/2018 10:15	10.36896706
5/19/2018 10:30	10.73649979
5/19/2018 10:45	10.73649979

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5/19/2018 11:15	12.17466736
5/19/2018 11:30	12.34381294
5/19/2018 11:45	12.79136467
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5/19/2018 12:15	13.12763023
5/19/2018 12:30	11.53760052
5/19/2018 12:45	11.09512329
5/19/2018 13:00	12.76247406
5/19/2018 13:15	11.91939354
5/19/2018 13:30	10.59724712
5/19/2018 13:45	11.91939354
5/19/2018 14:00	12.85513783
5/19/2018 14:15	12.46193981
5/19/2018 14:30	13.19949436
5/19/2018 14:45	13.16197777
5/19/2018 15:00	13.16197777
5/19/2018 15:15	12.67277622
5/19/2018 15:30	12.98669147
5/19/2018 15:45	17.45388985
5/19/2018 16:00	13.04898357
5/19/2018 16:15	17.82486725
5/19/2018 16:30	17.82486725
5/19/2018 16:45	16.71829605
5/19/2018 17:00	16.71829605
5/19/2018 17:15	16.71829605
5/19/2018 17:30	15.73316479
5/19/2018 17:45	16.53595352
5/19/2018 18:00	17.03524208
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5/19/2018 18:30	17.18687057
5/19/2018 18:45	17.18687057
5/19/2018 19:00	11.31992435
5/19/2018 19:15	10.07855225
5/19/2018 19:30	9.152018547
5/19/2018 19:45	9.152018547
5/19/2018 20:00	9.987218857
5/19/2018 20:15	10.64372063
5/19/2018 20:30	10.22099686
5/19/2018 20:45	10.22099686
5/19/2018 21:00	10.50225925
5/19/2018 21:15	10.50225925
5/19/2018 21:30	8.08782959
5/19/2018 21:45	10.95938778
5/19/2018 22:00	10.95938778
5/19/2018 22:15	11.22630692
5/19/2018 22:30	10.78374767
5/19/2018 22:45	12.22903538
5/19/2018 23:00	11.24320698
5/19/2018 23:15	11.24320698
5/19/2018 23:30	8.110770226
5/19/2018 23:45	6.694071293
5/20/2018 0:00	6.381882191
5/20/2018 0:15	5.6713624
5/20/2018 0:30	5.6713624
5/20/2018 0:45	7.04031229
5/20/2018 1:00	7.920351028
5/20/2018 1:15	7.920351028
5/20/2018 1:30	8.040065765
5/20/2018 1:45	7.257038593
5/20/2018 2:00	7.469702721
5/20/2018 2:15	7.469702721
5/20/2018 2:30	7.359613895
5/20/2018 2:45	8.445384979
5/20/2018 3:00	8.445384979
5/20/2018 3:15	9.637674332
5/20/2018 3:30	8.445384979
5/20/2018 3:45	7.459067822
5/20/2018 4:00	7.459067822
5/20/2018 4:15	5.739911079
5/20/2018 4:30	5.739911079
5/20/2018 4:45	5.370529175
5/20/2018 5:00	7.061251163
5/20/2018 5:15	7.16687727
5/20/2018 5:30	7.16687727
5/20/2018 5:45	6.944529057
5/20/2018 6:00	7.16687727
5/20/2018 6:15	7.619470119
5/20/2018 6:30	7.619470119
5/20/2018 6:45	7.504805565
5/20/2018 7:00	7.920351028
5/20/2018 7:15	7.619470119
5/20/2018 7:30	10.50542927
5/20/2018 7:45	10.62042141
5/20/2018 8:00	10.80086517
5/20/2018 8:15	12.82096958
5/20/2018 8:30	12.82096958
5/20/2018 8:45	12.82096958
5/20/2018 9:00	11.87998009
5/20/2018 9:15	12.82096958
5/20/2018 9:30	11.87998009
5/20/2018 9:45	11.87998009
5/20/2018 10:00	11.87998009
5/20/2018 10:15	12.52009392
5/20/2018 10:30	14.36102009
5/20/2018 10:45	14.55297947

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5/20/2018 11:15	16.76617622
5/20/2018 11:30	14.76012135
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5/20/2018 12:00	16.49547768
5/20/2018 12:15	16.32781982
5/20/2018 12:30	16.83899879
5/20/2018 12:45	16.16740227
5/20/2018 13:00	15.83058071
5/20/2018 13:15	16.16740227
5/20/2018 13:30	16.29785919
5/20/2018 13:45	16.29785919
5/20/2018 14:00	16.68634796
5/20/2018 14:15	16.68634796
5/20/2018 14:30	16.57205772
5/20/2018 14:45	8.532794952
5/20/2018 15:00	6.551454067
5/20/2018 15:15	6.121618748
5/20/2018 15:30	6.572110176
5/20/2018 15:45	6.572110176
5/20/2018 16:00	7.851584911
5/20/2018 16:15	9.582736015
5/20/2018 16:30	10.58253574
5/20/2018 16:45	11.32096863
5/20/2018 17:00	15.31660461
5/20/2018 17:15	15.72512531
5/20/2018 17:30	15.72512531
5/20/2018 17:45	15.50964546
5/20/2018 18:00	16.40589333
5/20/2018 18:15	16.05801964
5/20/2018 18:30	16.05801964
5/20/2018 18:45	16.64263916
5/20/2018 19:00	16.64263916
5/20/2018 19:15	12.55796909
5/20/2018 19:30	14.88351727
5/20/2018 19:45	14.88351727
5/20/2018 20:00	8.672943115
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5/20/2018 20:30	14.88351727
5/20/2018 20:45	8.672943115
5/20/2018 21:00	7.967082024
5/20/2018 21:15	8.743558884
5/20/2018 21:30	8.743558884
5/20/2018 21:45	12.04349709
5/20/2018 22:00	12.00481415
5/20/2018 22:15	12.00481415
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5/20/2018 22:45	8.39975071
5/20/2018 23:00	7.690124035
5/20/2018 23:15	6.987437248
5/20/2018 23:30	6.987437248
5/20/2018 23:45	6.886797428
5/21/2018 0:00	7.401487827
5/21/2018 0:15	7.597288609
5/21/2018 0:30	9.166581154
5/21/2018 0:45	9.032884598
5/21/2018 1:00	8.78194809
5/21/2018 1:15	8.78194809
5/21/2018 1:30	8.394323349
5/21/2018 1:45	8.176296234
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5/21/2018 2:45	7.120409012
5/21/2018 3:00	6.436725616
5/21/2018 3:15	6.436725616
5/21/2018 3:30	6.436725616
5/21/2018 3:45	6.536139965
5/21/2018 4:00	6.561932087
5/21/2018 4:15	6.462125778
5/21/2018 4:30	6.436725616
5/21/2018 4:45	6.536139965
5/21/2018 5:00	6.736306667
5/21/2018 5:15	6.736306667
5/21/2018 5:30	7.345245361
5/21/2018 5:45	7.570644855
5/21/2018 6:00	11.01330566
5/21/2018 6:15	7.68269825
5/21/2018 6:30	8.36503315
5/21/2018 6:45	8.36503315
5/21/2018 7:00	11.30692387
5/21/2018 7:15	9.468166351
5/21/2018 7:30	10.48124123
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5/21/2018 8:00	10.48124123
5/21/2018 8:15	9.752216339
5/21/2018 8:30	10.48124123
5/21/2018 8:45	13.48114681
5/21/2018 9:00	13.48114681
5/21/2018 9:15	13.48114681
5/21/2018 9:30	13.12867737
5/21/2018 9:45	11.73833275
5/21/2018 10:00	10.75982189
5/21/2018 10:15	10.60909462
5/21/2018 10:30	9.653812408
5/21/2018 10:45	10.60909462

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5/21/2018 11:15	12.21224499
5/21/2018 11:30	12.21224499
5/21/2018 11:45	17.0330658
5/21/2018 12:00	17.0330658
5/21/2018 12:15	12.97021866
5/21/2018 12:30	11.79312706
5/21/2018 12:45	11.79312706
5/21/2018 13:00	10.78024101
5/21/2018 13:15	10.57838917
5/21/2018 13:30	10.17998409
5/21/2018 13:45	10.17998409
5/21/2018 14:00	10.1312933
5/21/2018 14:15	9.836388588
5/21/2018 14:30	6.668607235
5/21/2018 14:45	6.767309666
5/21/2018 15:00	6.767309666
5/21/2018 15:15	6.92136097
5/21/2018 15:30	8.719272614
5/21/2018 15:45	8.719272614
5/21/2018 16:00	12.96970654
5/21/2018 16:15	12.96970654
5/21/2018 16:30	7.887569904
5/21/2018 16:45	7.887569904
5/21/2018 17:00	12.45444775
5/21/2018 17:15	8.59624958
5/21/2018 17:30	12.45444775
5/21/2018 17:45	14.2711916
5/21/2018 18:00	14.2711916
5/21/2018 18:15	12.95559216
5/21/2018 18:30	14.46993351
5/21/2018 18:45	16.31331444
5/21/2018 19:00	13.13601208
5/21/2018 19:15	13.13601208
5/21/2018 19:30	13.61567879
5/21/2018 19:45	13.22339344
5/21/2018 20:00	8.73773098
5/21/2018 20:15	8.608690262
5/21/2018 20:30	9.924033165
5/21/2018 20:45	9.924033165
5/21/2018 21:00	10.22221279
5/21/2018 21:15	11.13346958
5/21/2018 21:30	12.7631731
5/21/2018 21:45	16.14494896
5/21/2018 22:00	16.14494896
5/21/2018 22:15	16.14494896
5/21/2018 22:30	8.905673981
5/21/2018 22:45	8.201964378
5/21/2018 23:00	7.607331753
5/21/2018 23:15	8.083307266
5/21/2018 23:30	8.058232307
5/21/2018 23:45	8.419056892
5/22/2018 0:00	8.168337822
5/22/2018 0:15	8.043811798
5/22/2018 0:30	8.043811798
5/22/2018 0:45	8.96348381
5/22/2018 1:00	6.038557053
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5/22/2018 3:15	7.687846184
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5/22/2018 8:45	12.68039227
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5/22/2018 10:30	11.28439045
5/22/2018 10:45	11.46755219

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5/22/2018 11:45	12.54510498
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5/22/2018 15:00	7.381118298
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5/22/2018 15:30	6.635341167
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5/22/2018 18:30	7.053326607
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5/22/2018 19:15	9.844397545
5/22/2018 19:30	9.844397545
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5/22/2018 22:45	7.485949993
5/22/2018 23:00	6.600584507
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5/23/2018 10:30	9.980238914
5/23/2018 10:45	10.6731987

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5/23/2018 18:45	10.11072159
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5/23/2018 19:15	9.562767982
5/23/2018 19:30	6.929924488
5/23/2018 19:45	8.718164444
5/23/2018 20:00	9.917495728
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5/23/2018 22:00	14.41560459
5/23/2018 22:15	7.630242348
5/23/2018 22:30	7.608056068
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5/23/2018 23:15	7.758141041
5/23/2018 23:30	7.987395763
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5/24/2018 0:15	7.820242882
5/24/2018 0:30	7.655258179
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5/24/2018 1:45	6.095643997
5/24/2018 2:00	7.100628376
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5/24/2018 2:45	10.80219746
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5/24/2018 3:30	8.049264908
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5/24/2018 14:45	8.050723076
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5/24/2018 19:15	8.69556427
5/24/2018 19:30	8.542025566
5/24/2018 19:45	8.954094887
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5/24/2018 22:15	8.295311928
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5/24/2018 22:45	7.946001053
5/24/2018 23:00	7.715591908
5/24/2018 23:15	7.26395607
5/24/2018 23:30	6.82941103
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5/25/2018 0:30	7.924608707
5/25/2018 0:45	8.424413681
5/25/2018 1:00	7.808267593
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5/25/2018 1:45	6.288197994
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5/25/2018 4:00	6.461756706
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5/25/2018 7:00	15.15727901
5/25/2018 7:15	13.22449398
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5/25/2018 7:45	11.69506741
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5/25/2018 8:30	8.769272804
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5/25/2018 10:45	12.47621536

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5/25/2018 12:45	6.943502426
5/25/2018 13:00	7.748546124
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5/25/2018 14:45	9.865125656
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5/25/2018 18:30	8.675081253
5/25/2018 18:45	8.675081253
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5/25/2018 21:30	20.55377197
5/25/2018 21:45	20.55377197
5/25/2018 22:00	21.3637619
5/25/2018 22:15	21.25289726
5/25/2018 22:30	21.25289726
5/25/2018 22:45	19.57638168
5/25/2018 23:00	19.57638168
5/25/2018 23:15	20.00904846
5/25/2018 23:30	23.79462433
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5/26/2018 0:30	11.26350975
5/26/2018 0:45	11.26350975
5/26/2018 1:00	11.61008072
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5/26/2018 6:15	17.19366264
5/26/2018 6:30	15.71066952
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5/26/2018 8:45	16.67611885
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5/26/2018 9:15	15.41199589
5/26/2018 9:30	12.19387722
5/26/2018 9:45	11.88453484
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5/26/2018 10:15	10.85119724
5/26/2018 10:30	10.66713905
5/26/2018 10:45	10.53519058

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5/26/2018 11:45	13.99748135
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5/26/2018 16:30	7.140876293
5/26/2018 16:45	9.675780296
5/26/2018 17:00	9.675780296
5/26/2018 17:15	9.675780296
5/26/2018 17:30	9.675780296
5/26/2018 17:45	8.529082298
5/26/2018 18:00	8.529082298
5/26/2018 18:15	9.528422356
5/26/2018 18:30	11.12932587
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5/26/2018 20:45	10.65396309
5/26/2018 21:00	11.46569538
5/26/2018 21:15	15.69333458
5/26/2018 21:30	15.54215527
5/26/2018 21:45	16.00151634
5/26/2018 22:00	15.54215527
5/26/2018 22:15	18.27005768
5/26/2018 22:30	18.09104347
5/26/2018 22:45	17.81973457
5/26/2018 23:00	20.93892288
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5/27/2018 1:00	22.57549286
5/27/2018 1:15	22.81997681
5/27/2018 1:30	22.67378426
5/27/2018 1:45	22.91740227
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5/27/2018 2:15	18.80940437
5/27/2018 2:30	13.50959682
5/27/2018 2:45	19.0099659
5/27/2018 3:00	19.0099659
5/27/2018 3:15	19.0099659
5/27/2018 3:30	19.74786949
5/27/2018 3:45	23.73088264
5/27/2018 4:00	22.56911469
5/27/2018 4:15	22.56911469
5/27/2018 4:30	23.77710533
5/27/2018 4:45	22.80044556
5/27/2018 5:00	22.2827816
5/27/2018 5:15	14.63303471
5/27/2018 5:30	18.41574097
5/27/2018 5:45	18.41574097
5/27/2018 6:00	15.04355907
5/27/2018 6:15	11.27355576
5/27/2018 6:30	11.79539394
5/27/2018 6:45	10.60649109
5/27/2018 7:00	10.60649109
5/27/2018 7:15	11.79539394
5/27/2018 7:30	15.53749561
5/27/2018 7:45	17.20451546
5/27/2018 8:00	17.58834457
5/27/2018 8:15	15.3064394
5/27/2018 8:30	13.90322971
5/27/2018 8:45	13.02994442
5/27/2018 9:00	9.807132721
5/27/2018 9:15	9.776339531
5/27/2018 9:30	9.547580719
5/27/2018 9:45	9.620196342
5/27/2018 10:00	8.366399765
5/27/2018 10:15	6.411337376
5/27/2018 10:30	6.361746311
5/27/2018 10:45	7.50709486

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5/27/2018 11:15	7.260092258
5/27/2018 11:30	7.50709486
5/27/2018 11:45	9.206449509
5/27/2018 12:00	9.217823029
5/27/2018 12:15	10.44793892
5/27/2018 12:30	10.44793892
5/27/2018 12:45	8.39894104
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5/27/2018 13:15	5.746947289
5/27/2018 13:30	3.289517879
5/27/2018 13:45	5.614160061
5/27/2018 14:00	5.103110313
5/27/2018 14:15	1.885033965
5/27/2018 14:30	5.711052895
5/27/2018 14:45	7.703363895
5/27/2018 15:00	5.851306915
5/27/2018 15:15	8.112904549
5/27/2018 15:30	8.112904549
5/27/2018 15:45	7.827053547
5/27/2018 16:00	5.874995708
5/27/2018 16:15	5.874995708
5/27/2018 16:30	3.348474503
5/27/2018 16:45	6.165038586
5/27/2018 17:00	5.874995708
5/27/2018 17:15	6.633554935
5/27/2018 17:30	7.086842537
5/27/2018 17:45	7.086842537
5/27/2018 18:00	6.633554935
5/27/2018 18:15	10.60540485
5/27/2018 18:30	10.60540485
5/27/2018 18:45	9.432678223
5/27/2018 19:00	9.747558594
5/27/2018 19:15	9.952309608
5/27/2018 19:30	9.432678223
5/27/2018 19:45	6.495168686
5/27/2018 20:00	6.373621941
5/27/2018 20:15	3.745666027
5/27/2018 20:30	3.77947855
5/27/2018 20:45	4.018834591
5/27/2018 21:00	16.29578781
5/27/2018 21:15	15.18812943
5/27/2018 21:30	13.60531235
5/27/2018 21:45	10.70529938
5/27/2018 22:00	9.785731316
5/27/2018 22:15	10.06733131
5/27/2018 22:30	10.95190048
5/27/2018 22:45	9.993659019
5/27/2018 23:00	9.993659019
5/27/2018 23:15	9.993659019
5/27/2018 23:30	7.779810905
5/27/2018 23:45	7.063556194
5/28/2018 0:00	4.392494202
5/28/2018 0:15	4.392494202
5/28/2018 0:30	4.644068718
5/28/2018 0:45	5.761955261
5/28/2018 1:00	6.186213493
5/28/2018 1:15	6.20280695
5/28/2018 1:30	6.164173603
5/28/2018 1:45	5.940945625
5/28/2018 2:00	5.940945625
5/28/2018 2:15	5.25878191
5/28/2018 2:30	4.341485977
5/28/2018 2:45	3.921281576
5/28/2018 3:00	3.094357729
5/28/2018 3:15	3.160021305
5/28/2018 3:30	2.964319229
5/28/2018 3:45	2.964319229
5/28/2018 4:00	3.052090645
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5/28/2018 4:30	3.154239416
5/28/2018 4:45	3.052090645
5/28/2018 5:00	3.306431293
5/28/2018 5:15	3.306431293
5/28/2018 5:30	3.935972691
5/28/2018 5:45	4.958528519
5/28/2018 6:00	5.355190754
5/28/2018 6:15	5.355190754
5/28/2018 6:30	5.355190754
5/28/2018 6:45	9.64780426
5/28/2018 7:00	12.4027071
5/28/2018 7:15	12.57937717
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5/28/2018 8:00	7.371358871
5/28/2018 8:15	7.450246811
5/28/2018 8:30	7.57215929
5/28/2018 8:45	8.525919914
5/28/2018 9:00	12.49696732
5/28/2018 9:15	19.39358711
5/28/2018 9:30	19.39358711
5/28/2018 9:45	16.01029587
5/28/2018 10:00	15.53125477
5/28/2018 10:15	17.23422813
5/28/2018 10:30	16.26011086
5/28/2018 10:45	15.50217438

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5/28/2018 11:15	9.875034332
5/28/2018 11:30	9.825508118
5/28/2018 11:45	9.431705475
5/28/2018 12:00	6.202450275
5/28/2018 12:15	6.202450275
5/28/2018 12:30	7.905385017
5/28/2018 12:45	7.479664326
5/28/2018 13:00	11.59117794
5/28/2018 13:15	16.21136665
5/28/2018 13:30	16.73199654
5/28/2018 13:45	16.21136665
5/28/2018 14:00	16.58093071
5/28/2018 14:15	16.61641693
5/28/2018 14:30	16.06295013
5/28/2018 14:45	33.85250473
5/28/2018 15:00	52.80986023
5/28/2018 15:15	52.80986023
5/28/2018 15:30	36.90969086
5/28/2018 15:45	36.42974472
5/28/2018 16:00	10.77144146
5/28/2018 16:15	8.902522087
5/28/2018 16:30	9.72396946
5/28/2018 16:45	8.664796829
5/28/2018 17:00	8.587050438
5/28/2018 17:15	8.083129883
5/28/2018 17:30	6.799324989
5/28/2018 17:45	6.799324989
5/28/2018 18:00	7.481313705
5/28/2018 18:15	7.481313705
5/28/2018 18:30	7.481313705
5/28/2018 18:45	7.481313705
5/28/2018 19:00	7.841775417
5/28/2018 19:15	9.542179108
5/28/2018 19:30	11.41373444
5/28/2018 19:45	11.41373444
5/28/2018 20:00	9.542179108
5/28/2018 20:15	6.862228394
5/28/2018 20:30	6.515757084
5/28/2018 20:45	6.515757084
5/28/2018 21:00	7.664414406
5/28/2018 21:15	8.328661919
5/28/2018 21:30	8.581500053
5/28/2018 21:45	8.581500053
5/28/2018 22:00	8.19203949
5/28/2018 22:15	8.19203949
5/28/2018 22:30	8.19203949
5/28/2018 22:45	8.088938713
5/28/2018 23:00	6.62182045
5/28/2018 23:15	9.983818054
5/28/2018 23:30	7.203400612
5/28/2018 23:45	7.559892654
5/29/2018 0:00	10.02615547
5/29/2018 0:15	10.52234459
5/29/2018 0:30	9.993075371
5/29/2018 0:45	10.10586452
5/29/2018 1:00	9.993075371
5/29/2018 1:15	9.067790031
5/29/2018 1:30	8.125934601
5/29/2018 1:45	8.381598473
5/29/2018 2:00	6.867163658
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5/29/2018 2:45	11.79511833
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5/29/2018 3:15	11.55287838
5/29/2018 3:30	12.91850471
5/29/2018 3:45	8.131631851
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5/29/2018 4:15	8.131631851
5/29/2018 4:30	8.012461662
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5/29/2018 5:45	9.990472794
5/29/2018 6:00	11.76266193
5/29/2018 6:15	11.76266193
5/29/2018 6:30	14.63437843
5/29/2018 6:45	14.90095901
5/29/2018 7:00	11.688797
5/29/2018 7:15	10.79727936
5/29/2018 7:30	11.688797
5/29/2018 7:45	11.688797
5/29/2018 8:00	11.688797
5/29/2018 8:15	12.46246624
5/29/2018 8:30	12.15991402
5/29/2018 8:45	11.34459877
5/29/2018 9:00	11.34459877
5/29/2018 9:15	12.08637238
5/29/2018 9:30	9.971986771
5/29/2018 9:45	9.971986771
5/29/2018 10:00	10.95027256
5/29/2018 10:15	10.95027256
5/29/2018 10:30	13.02330017
5/29/2018 10:45	12.82206535

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5/29/2018 11:30	10.62529659
5/29/2018 11:45	9.343193054
5/29/2018 12:00	9.17927742
5/29/2018 12:15	7.38398695
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5/29/2018 12:45	4.511271477
5/29/2018 13:00	4.511271477
5/29/2018 13:15	5.173347473
5/29/2018 13:30	6.754956722
5/29/2018 13:45	7.516861439
5/29/2018 14:00	7.516861439
5/29/2018 14:15	9.358257294
5/29/2018 14:30	6.036387444
5/29/2018 14:45	6.455055237
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5/29/2018 15:30	10.88566208
5/29/2018 15:45	10.88566208
5/29/2018 16:00	9.502300262
5/29/2018 16:15	8.115161896
5/29/2018 16:30	8.115161896
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5/29/2018 18:45	7.779557705
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5/29/2018 19:45	7.71775198
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5/29/2018 20:30	8.308962822
5/29/2018 20:45	8.829409599
5/29/2018 21:00	6.282230854
5/29/2018 21:15	6.380199432
5/29/2018 21:30	6.380199432
5/29/2018 21:45	6.54926157
5/29/2018 22:00	6.346414566
5/29/2018 22:15	6.145502567
5/29/2018 22:30	5.208022118
5/29/2018 22:45	5.119477272
5/29/2018 23:00	5.031391621
5/29/2018 23:15	5.439445019
5/29/2018 23:30	5.439445019
5/29/2018 23:45	7.706781864
5/30/2018 0:00	5.252754688
5/30/2018 0:15	5.252754688
5/30/2018 0:30	4.148637772
5/30/2018 0:45	4.148637772
5/30/2018 1:00	3.860344648
5/30/2018 1:15	3.772623062
5/30/2018 1:30	3.89760828
5/30/2018 1:45	3.831342697
5/30/2018 2:00	3.765420675
5/30/2018 2:15	4.136971951
5/30/2018 2:30	5.539422035
5/30/2018 2:45	6.619234562
5/30/2018 3:00	6.732339859
5/30/2018 3:15	6.732339859
5/30/2018 3:30	6.619234562
5/30/2018 3:45	6.252413273
5/30/2018 4:00	5.9404006
5/30/2018 4:15	5.9404006
5/30/2018 4:30	5.285611153
5/30/2018 4:45	6.150532722
5/30/2018 5:00	6.463685513
5/30/2018 5:15	7.557706833
5/30/2018 5:30	8.8117733
5/30/2018 5:45	9.377671242
5/30/2018 6:00	8.758626938
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5/30/2018 6:30	8.892281532
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5/30/2018 7:00	10.50229645
5/30/2018 7:15	11.06883526
5/30/2018 7:30	11.90273857
5/30/2018 7:45	13.96485615
5/30/2018 8:00	13.96485615
5/30/2018 8:15	13.96485615
5/30/2018 8:30	12.86911583
5/30/2018 8:45	13.24620342
5/30/2018 9:00	13.24620342
5/30/2018 9:15	14.27615261
5/30/2018 9:30	14.88032532
5/30/2018 9:45	14.86388969
5/30/2018 10:00	13.55969334
5/30/2018 10:15	14.06087017
5/30/2018 10:30	11.54574966
5/30/2018 10:45	9.401690483

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5/30/2018 11:15	7.767075539
5/30/2018 11:30	6.806052208
5/30/2018 11:45	6.069261074
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5/30/2018 12:15	6.097267628
5/30/2018 12:30	6.044360638
5/30/2018 12:45	5.817941666
5/30/2018 13:00	6.444713593
5/30/2018 13:15	6.805981636
5/30/2018 13:30	10.41357708
5/30/2018 13:45	11.41894627
5/30/2018 14:00	11.41894627
5/30/2018 14:15	9.791760445
5/30/2018 14:30	8.556821823
5/30/2018 14:45	8.137535095
5/30/2018 15:00	7.821600437
5/30/2018 15:15	6.416749477
5/30/2018 15:30	7.29385376
5/30/2018 15:45	7.29385376
5/30/2018 16:00	5.062228203
5/30/2018 16:15	5.442903042
5/30/2018 16:30	8.685238838
5/30/2018 16:45	9.134206772
5/30/2018 17:00	9.004983902
5/30/2018 17:15	11.33725643
5/30/2018 17:30	10.31809235
5/30/2018 17:45	10.22609234
5/30/2018 18:00	10.50897026
5/30/2018 18:15	11.33035183
5/30/2018 18:30	10.82212543
5/30/2018 18:45	10.82212543
5/30/2018 19:00	8.332076073
5/30/2018 19:15	8.150547981
5/30/2018 19:30	7.255266666
5/30/2018 19:45	7.376356602
5/30/2018 20:00	7.352457047
5/30/2018 20:15	8.908982277
5/30/2018 20:30	8.908982277
5/30/2018 20:45	8.908982277
5/30/2018 21:00	8.632720947
5/30/2018 21:15	9.942204475
5/30/2018 21:30	8.69133091
5/30/2018 21:45	6.210125923
5/30/2018 22:00	6.210125923
5/30/2018 22:15	4.823994637
5/30/2018 22:30	4.433446884
5/30/2018 22:45	3.723716259
5/30/2018 23:00	4.051743507
5/30/2018 23:15	5.497449398
5/30/2018 23:30	8.686763763
5/30/2018 23:45	6.977095127
5/31/2018 0:00	6.875249863
5/31/2018 0:15	6.875249863
5/31/2018 0:30	6.666586399
5/31/2018 0:45	6.065244198
5/31/2018 1:00	5.976709366
5/31/2018 1:15	5.976709366
5/31/2018 1:30	6.065244198
5/31/2018 1:45	6.162172794
5/31/2018 2:00	6.162172794
5/31/2018 2:15	6.246725082
5/31/2018 2:30	6.162172794
5/31/2018 2:45	5.945299625
5/31/2018 3:00	5.858515263
5/31/2018 3:15	7.171630383
5/31/2018 3:30	7.171630383
5/31/2018 3:45	8.585755348
5/31/2018 4:00	9.558086395
5/31/2018 4:15	9.558086395
5/31/2018 4:30	8.997896194
5/31/2018 4:45	5.234947205
5/31/2018 5:00	5.315870285
5/31/2018 5:15	5.315870285
5/31/2018 5:30	5.605759621
5/31/2018 5:45	7.007264137
5/31/2018 6:00	6.891961098
5/31/2018 6:15	6.943009853
5/31/2018 6:30	6.212408066
5/31/2018 6:45	6.663087845
5/31/2018 7:00	8.785689354
5/31/2018 7:15	8.785689354
5/31/2018 7:30	8.785689354
5/31/2018 7:45	11.10365009
5/31/2018 8:00	9.278580666
5/31/2018 8:15	9.278580666
5/31/2018 8:30	9.885766029
5/31/2018 8:45	10.23643684
5/31/2018 9:00	9.885766029
5/31/2018 9:15	11.49199772
5/31/2018 9:30	12.01727009
5/31/2018 9:45	11.92958736
5/31/2018 10:00	11.57013226
5/31/2018 10:15	12.42775631
5/31/2018 10:30	12.65113735
5/31/2018 10:45	11.83415794

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5/31/2018 11:15	12.24250126
5/31/2018 11:30	10.7162981
5/31/2018 11:45	8.039039612
5/31/2018 12:00	6.793563366
5/31/2018 12:15	8.020406723
5/31/2018 12:30	6.793563366
5/31/2018 12:45	6.793563366
5/31/2018 13:00	7.382443905
5/31/2018 13:15	6.951910496
5/31/2018 13:30	6.509996414
5/31/2018 13:45	5.86020422
5/31/2018 14:00	5.437815189
5/31/2018 14:15	5.617233753
5/31/2018 14:30	6.645035744
5/31/2018 14:45	6.645035744
5/31/2018 15:00	5.754742146
5/31/2018 15:15	6.249821186
5/31/2018 15:30	5.754742146
5/31/2018 15:45	6.523975372
5/31/2018 16:00	6.581056118
5/31/2018 16:15	7.909612179
5/31/2018 16:30	7.103581429
5/31/2018 16:45	7.076435089
5/31/2018 17:00	7.108608246
5/31/2018 17:15	6.836009979
5/31/2018 17:30	5.523536682
5/31/2018 17:45	6.120901108
5/31/2018 18:00	6.120901108
5/31/2018 18:15	4.873813152
5/31/2018 18:30	5.292923927
5/31/2018 18:45	5.520368576
5/31/2018 19:00	5.750730515
5/31/2018 19:15	7.341586113
5/31/2018 19:30	8.024597168
5/31/2018 19:45	8.584007263
5/31/2018 20:00	9.033573151
5/31/2018 20:15	9.119859695
5/31/2018 20:30	8.312088013
5/31/2018 20:45	8.050749779
5/31/2018 21:00	7.558631897
5/31/2018 21:15	6.488472462
5/31/2018 21:30	5.799333572
5/31/2018 21:45	5.832327366
5/31/2018 22:00	5.643042088
5/31/2018 22:15	6.634600163
5/31/2018 22:30	8.225611687
5/31/2018 22:45	8.264976501
5/31/2018 23:00	8.672250748
5/31/2018 23:15	9.504021645
5/31/2018 23:30	9.504021645
5/31/2018 23:45	9.504021645
6/1/2018 0:00	8.60167408
6/1/2018 0:15	9.850328445
6/1/2018 0:30	9.248207092
6/1/2018 0:45	9.033573151
6/1/2018 1:00	7.399220943
6/1/2018 1:15	8.888262749
6/1/2018 1:30	8.519609451
6/1/2018 1:45	7.520545483
6/1/2018 2:00	7.78453207
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6/1/2018 2:30	8.042630196
6/1/2018 2:45	8.042630196
6/1/2018 3:00	7.78453207
6/1/2018 3:15	8.236493111
6/1/2018 3:30	8.945009232
6/1/2018 3:45	8.945009232
6/1/2018 4:00	7.612259388
6/1/2018 4:15	7.755738735
6/1/2018 4:30	7.612259388
6/1/2018 4:45	7.612259388
6/1/2018 5:00	7.878304005
6/1/2018 5:15	9.310741425
6/1/2018 5:30	11.11097813
6/1/2018 5:45	12.38014698
6/1/2018 6:00	12.19943237
6/1/2018 6:15	10.95667267
6/1/2018 6:30	11.44119644
6/1/2018 6:45	11.44119644
6/1/2018 7:00	10.36264801
6/1/2018 7:15	11.44119644
6/1/2018 7:30	7.932967186
6/1/2018 7:45	7.797763824
6/1/2018 8:00	10.35021019
6/1/2018 8:15	10.82791233
6/1/2018 8:30	10.82791233
6/1/2018 8:45	10.82791233
6/1/2018 9:00	11.77622795
6/1/2018 9:15	12.75808811
6/1/2018 9:30	12.71970367
6/1/2018 9:45	12.71970367
6/1/2018 10:00	12.14262486
6/1/2018 10:15	8.190068245
6/1/2018 10:30	8.190068245
6/1/2018 10:45	8.190068245

Site 16 – MH 26.01 Flow Meter Data

6/1/2018 11:00	10.20512199
6/1/2018 11:15	10.20512199
6/1/2018 11:30	10.20512199
6/1/2018 11:45	10.11885357
6/1/2018 12:00	9.355695724
6/1/2018 12:15	8.605371475
6/1/2018 12:30	8.172701836
6/1/2018 12:45	8.172701836
6/1/2018 13:00	7.504481316
6/1/2018 13:15	8.590750694
6/1/2018 13:30	8.590750694
6/1/2018 13:45	8.276921272
6/1/2018 14:00	6.659171104
6/1/2018 14:15	7.924263477
6/1/2018 14:30	6.195897102
6/1/2018 14:45	5.949585915
6/1/2018 15:00	5.949585915
6/1/2018 15:15	7.830583572
6/1/2018 15:30	7.830583572
6/1/2018 15:45	10.03975773
6/1/2018 16:00	10.03975773
6/1/2018 16:15	9.27443409
6/1/2018 16:30	7.455892086
6/1/2018 16:45	6.545357227
6/1/2018 17:00	5.420994759
6/1/2018 17:15	4.289389133
6/1/2018 17:30	2.422642708
6/1/2018 17:45	2.422642708
6/1/2018 18:00	2.607265472
6/1/2018 18:15	3.711843967
6/1/2018 18:30	7.364210606
6/1/2018 18:45	9.938468933
6/1/2018 19:00	11.02109909
6/1/2018 19:15	10.65044212
6/1/2018 19:30	9.683101654
6/1/2018 19:45	11.10597897
6/1/2018 20:00	10.88149071
6/1/2018 20:15	11.28094769
6/1/2018 20:30	11.04013348
6/1/2018 20:45	10.78398037
6/1/2018 21:00	9.579218864
6/1/2018 21:15	8.591645241
6/1/2018 21:30	8.287823677
6/1/2018 21:45	6.812774658
6/1/2018 22:00	8.259972572
6/1/2018 22:15	6.088096619
6/1/2018 22:30	4.956914902
6/1/2018 22:45	4.956914902
6/1/2018 23:00	6.164335251
6/1/2018 23:15	5.159419537
6/1/2018 23:30	6.164335251
6/1/2018 23:45	6.067214489
6/2/2018 0:00	5.481021404
6/2/2018 0:15	5.405795097
6/2/2018 0:30	6.816969872
6/2/2018 0:45	5.500062943
6/2/2018 1:00	6.1506567
6/2/2018 1:15	5.295341492
6/2/2018 1:30	5.500062943
6/2/2018 1:45	5.500062943
6/2/2018 2:00	4.995418549
6/2/2018 2:15	4.995418549
6/2/2018 2:30	4.995418549
6/2/2018 2:45	6.653568745
6/2/2018 3:00	6.647348881
6/2/2018 3:15	8.815605164
6/2/2018 3:30	6.610424042
6/2/2018 3:45	6.974863529
6/2/2018 4:00	6.910411358
6/2/2018 4:15	6.742711544
6/2/2018 4:30	6.974863529
6/2/2018 4:45	6.974863529
6/2/2018 5:00	8.066890717
6/2/2018 5:15	8.293829918
6/2/2018 5:30	7.843366146
6/2/2018 5:45	7.377851009
6/2/2018 6:00	5.491158009
6/2/2018 6:15	4.701259613
6/2/2018 6:30	6.142280579
6/2/2018 6:45	6.477747917
6/2/2018 7:00	5.46404171
6/2/2018 7:15	6.142280579
6/2/2018 7:30	5.902296066
6/2/2018 7:45	7.0725317
6/2/2018 8:00	4.790956974
6/2/2018 8:15	7.0725317
6/2/2018 8:30	6.655322552
6/2/2018 8:45	7.532331467
6/2/2018 9:00	11.86771488
6/2/2018 9:15	13.96893787
6/2/2018 9:30	13.96893787
6/2/2018 9:45	14.02840614
6/2/2018 10:00	14.02840614
6/2/2018 10:15	10.70971203
6/2/2018 10:30	10.62727642
6/2/2018 10:45	10.62727642

Site 16 – MH 26.01 Flow Meter Data

6/2/2018 11:00	10.76613331
6/2/2018 11:15	13.45285988
6/2/2018 11:30	15.35866451
6/2/2018 11:45	12.96813011
6/2/2018 12:00	10.59249878
6/2/2018 12:15	10.33677578
6/2/2018 12:30	11.52670479
6/2/2018 12:45	11.00690365
6/2/2018 13:00	11.52670479
6/2/2018 13:15	13.49174023
6/2/2018 13:30	14.76110077
6/2/2018 13:45	16.01239395
6/2/2018 14:00	16.01239395
6/2/2018 14:15	16.01239395
6/2/2018 14:30	15.79802132
6/2/2018 14:45	13.26329041
6/2/2018 15:00	10.81239319
6/2/2018 15:15	13.26329041
6/2/2018 15:30	13.45046139
6/2/2018 15:45	13.45046139
6/2/2018 16:00	15.62553596
6/2/2018 16:15	15.62553596
6/2/2018 16:30	14.67175293
6/2/2018 16:45	14.67175293
6/2/2018 17:00	15.67315197
6/2/2018 17:15	14.34799004
6/2/2018 17:30	14.65158081
6/2/2018 17:45	12.02997398
6/2/2018 18:00	7.124144077
6/2/2018 18:15	7.334729195
6/2/2018 18:30	7.693006992
6/2/2018 18:45	8.42372036
6/2/2018 19:00	8.672720909
6/2/2018 19:15	9.006374359
6/2/2018 19:30	11.89283657
6/2/2018 19:45	12.23602962
6/2/2018 20:00	10.88073921
6/2/2018 20:15	10.9014492
6/2/2018 20:30	10.45639229
6/2/2018 20:45	10.7561636
6/2/2018 21:00	10.28068352
6/2/2018 21:15	10.20461082
6/2/2018 21:30	9.512646675
6/2/2018 21:45	8.762393951
6/2/2018 22:00	8.762393951
6/2/2018 22:15	8.353385925
6/2/2018 22:30	8.762393951
6/2/2018 22:45	10.50395393
6/2/2018 23:00	9.851784706
6/2/2018 23:15	9.851784706
6/2/2018 23:30	9.851784706
6/2/2018 23:45	9.074011803
6/3/2018 0:00	7.106011868
6/3/2018 0:15	5.62994194
6/3/2018 0:30	5.62994194
6/3/2018 0:45	6.205044746
6/3/2018 1:00	7.705739021
6/3/2018 1:15	8.932722092
6/3/2018 1:30	11.82019234
6/3/2018 1:45	11.97843456
6/3/2018 2:00	11.85451603
6/3/2018 2:15	11.85451603
6/3/2018 2:30	5.234273434
6/3/2018 2:45	5.390079498
6/3/2018 3:00	5.234273434
6/3/2018 3:15	6.96554327
6/3/2018 3:30	6.96554327
6/3/2018 3:45	6.96554327
6/3/2018 4:00	6.862544537
6/3/2018 4:15	6.96554327
6/3/2018 4:30	6.759802341
6/3/2018 4:45	8.020985603
6/3/2018 5:00	12.16810131
6/3/2018 5:15	12.16810131
6/3/2018 5:30	10.02559948
6/3/2018 5:45	11.63623619
6/3/2018 6:00	9.41583252
6/3/2018 6:15	10.03446007
6/3/2018 6:30	9.679699898
6/3/2018 6:45	10.03446007
6/3/2018 7:00	10.03446007
6/3/2018 7:15	9.417978287
6/3/2018 7:30	11.19817543
6/3/2018 7:45	10.26302719
6/3/2018 8:00	13.17171001
6/3/2018 8:15	13.92733383
6/3/2018 8:30	13.92733383
6/3/2018 8:45	11.45831776
6/3/2018 9:00	12.36779499
6/3/2018 9:15	9.707817078
6/3/2018 9:30	8.455509186
6/3/2018 9:45	8.455509186
6/3/2018 10:00	9.814831734
6/3/2018 10:15	9.999222755
6/3/2018 10:30	9.999222755
6/3/2018 10:45	12.49990368

Site 16 – MH 26.01 Flow Meter Data

6/3/2018 11:00	13.43354034
6/3/2018 11:15	13.05342484
6/3/2018 11:30	8.713984489
6/3/2018 11:45	14.02840614
6/3/2018 12:00	8.467120171
6/3/2018 12:15	8.222369194
6/3/2018 12:30	8.563166618
6/3/2018 12:45	8.563166618
6/3/2018 13:00	8.065677643
6/3/2018 13:15	8.563166618
6/3/2018 13:30	6.78346014
6/3/2018 13:45	7.126570225
6/3/2018 14:00	8.120609283
6/3/2018 14:15	7.996673107
6/3/2018 14:30	7.996673107
6/3/2018 14:45	9.69687748
6/3/2018 15:00	9.69687748
6/3/2018 15:15	10.15733814
6/3/2018 15:30	11.23118591
6/3/2018 15:45	11.80181694
6/3/2018 16:00	11.80181694
6/3/2018 16:15	14.74750423
6/3/2018 16:30	14.74750423
6/3/2018 16:45	8.495159149
6/3/2018 17:00	7.826838017
6/3/2018 17:15	8.062285423
6/3/2018 17:30	7.826838017
6/3/2018 17:45	6.020821095
6/3/2018 18:00	9.032669067
6/3/2018 18:15	8.864539146
6/3/2018 18:30	9.437439919
6/3/2018 18:45	8.864539146
6/3/2018 19:00	8.864539146
6/3/2018 19:15	12.07648182
6/3/2018 19:30	10.12304211
6/3/2018 19:45	9.821840286
6/3/2018 20:00	10.12304211
6/3/2018 20:15	10.64047241
6/3/2018 20:30	10.64047241
6/3/2018 20:45	10.02173328
6/3/2018 21:00	9.76271534
6/3/2018 21:15	9.29268837
6/3/2018 21:30	8.528793335
6/3/2018 21:45	6.800880432
6/3/2018 22:00	5.645989418
6/3/2018 22:15	5.13081789
6/3/2018 22:30	5.645989418
6/3/2018 22:45	5.330402374
6/3/2018 23:00	5.330402374
6/3/2018 23:15	5.330402374
6/3/2018 23:30	6.04583168
6/3/2018 23:45	6.04583168
6/4/2018 0:00	7.433918476
6/4/2018 0:15	7.433918476
6/4/2018 0:30	7.549859524
6/4/2018 0:45	7.549859524
6/4/2018 1:00	7.620942116
6/4/2018 1:15	5.755548954
6/4/2018 1:30	5.755548954
6/4/2018 1:45	5.755548954
6/4/2018 2:00	5.939445019
6/4/2018 2:15	5.284822941
6/4/2018 2:30	5.198050022
6/4/2018 2:45	5.847805977
6/4/2018 3:00	6.700399876
6/4/2018 3:15	8.844056129
6/4/2018 3:30	8.844056129
6/4/2018 3:45	8.844056129
6/4/2018 4:00	6.195885181
6/4/2018 4:15	6.195885181
6/4/2018 4:30	6.195885181
6/4/2018 4:45	6.118841171
6/4/2018 5:00	6.490636349
6/4/2018 5:15	7.06347847
6/4/2018 5:30	8.36077404
6/4/2018 5:45	8.445469856
6/4/2018 6:00	8.445469856
6/4/2018 6:15	8.932719231
6/4/2018 6:30	9.032604218
6/4/2018 6:45	9.087543488
6/4/2018 7:00	9.032604218
6/4/2018 7:15	9.058670044
6/4/2018 7:30	9.672341347
6/4/2018 7:45	13.37487507
6/4/2018 8:00	11.87855244
6/4/2018 8:15	11.87855244
6/4/2018 8:30	12.26537323
6/4/2018 8:45	12.65586567
6/4/2018 9:00	14.01205158
6/4/2018 9:15	11.94873142
6/4/2018 9:30	11.33464909
6/4/2018 9:45	11.33464909
6/4/2018 10:00	11.17177391
6/4/2018 10:15	10.26046467
6/4/2018 10:30	8.506632805
6/4/2018 10:45	7.995458126

Site 16 – MH 26.01 Flow Meter Data

6/4/2018 11:00	8.506632805
6/4/2018 11:15	8.229074478
6/4/2018 11:30	8.346603394
6/4/2018 11:45	8.260170937
6/4/2018 12:00	8.114902496
6/4/2018 12:15	8.382200241
6/4/2018 12:30	8.480244637
6/4/2018 12:45	8.313429832
6/4/2018 13:00	8.84485817
6/4/2018 13:15	9.145643234
6/4/2018 13:30	10.18826675
6/4/2018 13:45	8.562807083
6/4/2018 14:00	9.707168579
6/4/2018 14:15	8.71919632
6/4/2018 14:30	8.71919632
6/4/2018 14:45	8.072257042
6/4/2018 15:00	8.969857216
6/4/2018 15:15	7.173242569
6/4/2018 15:30	7.825888157
6/4/2018 15:45	7.825888157
6/4/2018 16:00	7.850241661
6/4/2018 16:15	7.974629879
6/4/2018 16:30	7.974629879
6/4/2018 16:45	8.870951653
6/4/2018 17:00	6.765789509
6/4/2018 17:15	6.765789509
6/4/2018 17:30	6.661400795
6/4/2018 17:45	8.734083176
6/4/2018 18:00	9.827228546
6/4/2018 18:15	10.74772167
6/4/2018 18:30	10.74772167
6/4/2018 18:45	10.90767193
6/4/2018 19:00	10.48442364
6/4/2018 19:15	9.342868805
6/4/2018 19:30	7.74555254
6/4/2018 19:45	7.74555254
6/4/2018 20:00	7.74555254
6/4/2018 20:15	7.74555254
6/4/2018 20:30	7.896598816
6/4/2018 20:45	9.131719589
6/4/2018 21:00	8.594047546
6/4/2018 21:15	9.587739944
6/4/2018 21:30	9.140584946
6/4/2018 21:45	9.257740974
6/4/2018 22:00	9.023217201
6/4/2018 22:15	9.395516396
6/4/2018 22:30	8.469369888
6/4/2018 22:45	7.193738461
6/4/2018 23:00	7.193738461
6/4/2018 23:15	7.193738461
6/4/2018 23:30	6.190477371
6/4/2018 23:45	8.521923065
6/5/2018 0:00	9.74061203
6/5/2018 0:15	10.31358814
6/5/2018 0:30	10.84279823
6/5/2018 0:45	11.19995022
6/5/2018 1:00	8.676716805
6/5/2018 1:15	7.424407005
6/5/2018 1:30	6.612530231
6/5/2018 1:45	7.304423332
6/5/2018 2:00	6.506847858
6/5/2018 2:15	5.60440731
6/5/2018 2:30	5.232174873
6/5/2018 2:45	6.386467934
6/5/2018 3:00	5.232174873
6/5/2018 3:15	7.488659382
6/5/2018 3:30	7.946118832
6/5/2018 3:45	8.181362152
6/5/2018 4:00	8.047584534
6/5/2018 4:15	8.181362152
6/5/2018 4:30	8.181362152
6/5/2018 4:45	6.332653522
6/5/2018 5:00	6.102493763
6/5/2018 5:15	6.102493763
6/5/2018 5:30	6.253461838
6/5/2018 5:45	4.940681934
6/5/2018 6:00	7.236583233
6/5/2018 6:15	8.29224205
6/5/2018 6:30	10.50732708
6/5/2018 6:45	10.50732708
6/5/2018 7:00	11.72611141
6/5/2018 7:15	13.28959465
6/5/2018 7:30	11.72611141
6/5/2018 7:45	13.28959465
6/5/2018 8:00	13.28959465
6/5/2018 8:15	12.56012726

Site 17 – MH 18.02 Flow Meter Data

Inst Time	Flow 3 (gpm)
5/11/2018 13:15	27.16928864
5/11/2018 13:30	27.16928864
5/11/2018 13:45	15.43003273
5/11/2018 14:00	15.43003273
5/11/2018 14:15	12.278615
5/11/2018 14:30	13.0766716
5/11/2018 14:45	12.278615
5/11/2018 15:00	9.55760479
5/11/2018 15:15	9.55760479
5/11/2018 15:30	9.731894493
5/11/2018 15:45	9.731894493
5/11/2018 16:00	12.74153328
5/11/2018 16:15	15.25846958
5/11/2018 16:30	14.87632656
5/11/2018 16:45	14.87632656
5/11/2018 17:00	14.87632656
5/11/2018 17:15	13.56349754
5/11/2018 17:30	9.43126297
5/11/2018 17:45	8.72368145
5/11/2018 18:00	9.43126297
5/11/2018 18:15	9.239098549
5/11/2018 18:30	9.643530846
5/11/2018 18:45	9.643530846
5/11/2018 19:00	11.17687225
5/11/2018 19:15	11.17687225
5/11/2018 19:30	9.752062798
5/11/2018 19:45	10.79963684
5/11/2018 20:00	14.83786011
5/11/2018 20:15	10.79963684
5/11/2018 20:30	10.46693325
5/11/2018 20:45	10.46693325
5/11/2018 21:00	9.82220459
5/11/2018 21:15	9.399877548
5/11/2018 21:30	9.399877548
5/11/2018 21:45	9.399877548
5/11/2018 22:00	14.12958717
5/11/2018 22:15	14.12958717
5/11/2018 22:30	16.99252701
5/11/2018 22:45	16.99252701
5/11/2018 23:00	11.49856377
5/11/2018 23:15	8.671043396
5/11/2018 23:30	8.671043396
5/11/2018 23:45	8.671043396
5/12/2018 0:00	8.809437752
5/12/2018 0:15	8.823455811
5/12/2018 0:30	8.743873596
5/12/2018 0:45	8.743873596
5/12/2018 1:00	8.519856453
5/12/2018 1:15	8.743873596
5/12/2018 1:30	8.992008209
5/12/2018 1:45	10.98236465
5/12/2018 2:00	10.98236465
5/12/2018 2:15	6.280130386
5/12/2018 2:30	6.120230198
5/12/2018 2:45	5.600377083
5/12/2018 3:00	5.376102448
5/12/2018 3:15	5.399518013
5/12/2018 3:30	5.399518013
5/12/2018 3:45	5.978534698
5/12/2018 4:00	5.978534698
5/12/2018 4:15	5.943682671
5/12/2018 4:30	5.612514973
5/12/2018 4:45	5.42064333
5/12/2018 5:00	5.42064333
5/12/2018 5:15	5.905397415
5/12/2018 5:30	7.710586548
5/12/2018 5:45	7.710586548
5/12/2018 6:00	7.710586548
5/12/2018 6:15	7.710586548
5/12/2018 6:30	7.815888405
5/12/2018 6:45	7.324767113
5/12/2018 7:00	7.927867413
5/12/2018 7:15	10.42765808
5/12/2018 7:30	11.01935959
5/12/2018 7:45	11.01935959
5/12/2018 8:00	11.88458824
5/12/2018 8:15	16.35506821
5/12/2018 8:30	15.29099655
5/12/2018 8:45	15.29099655
5/12/2018 9:00	11.88458824
5/12/2018 9:15	15.29099655
5/12/2018 9:30	13.113204
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Site 17 – MH 18.02 Flow Meter Data

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Site 17 – MH 18.02 Flow Meter Data

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5/21/2018 14:45	0.917741656
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5/21/2018 17:00	11.02867508
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5/21/2018 21:45	7.267877102
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5/21/2018 22:15	6.104537487
5/21/2018 22:30	6.987697124
5/21/2018 22:45	7.071227551
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5/22/2018 3:15	3.018793821
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5/22/2018 18:30	7.559019566
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5/22/2018 19:00	9.419222832
5/22/2018 19:15	9.002223969
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5/22/2018 19:45	11.40396786
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5/22/2018 20:45	10.84233952
5/22/2018 21:00	7.05362606
5/22/2018 21:15	6.493461609
5/22/2018 21:30	6.303346157
5/22/2018 21:45	6.303346157
5/22/2018 22:00	6.303346157
5/22/2018 22:15	6.475908279
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5/23/2018 0:45	3.869889021
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5/23/2018 1:15	4.473912716
5/23/2018 1:30	4.308551311
5/23/2018 1:45	3.950802326
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5/23/2018 2:15	3.104976892
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5/23/2018 2:45	3.131508827
5/23/2018 3:00	3.211709738
5/23/2018 3:15	3.198779345
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5/23/2018 4:00	3.704290628
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5/23/2018 4:30	3.895824432
5/23/2018 4:45	3.895824432
5/23/2018 5:00	4.592763424
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5/23/2018 12:45	11.94598007

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5/23/2018 16:00	7.10269165
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5/23/2018 19:45	8.830608368
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5/23/2018 20:30	10.50173664
5/23/2018 20:45	10.50173664
5/23/2018 21:00	10.50173664
5/23/2018 21:15	13.29242516
5/23/2018 21:30	5.530127048
5/23/2018 21:45	5.530127048
5/23/2018 22:00	5.530127048
5/23/2018 22:15	9.67533493
5/23/2018 22:30	5.569056511
5/23/2018 22:45	6.708886623
5/23/2018 23:00	6.708886623
5/23/2018 23:15	6.708886623
5/23/2018 23:30	5.071824551
5/23/2018 23:45	4.582603931
5/24/2018 0:00	4.582603931
5/24/2018 0:15	4.128227234
5/24/2018 0:30	4.159823418
5/24/2018 0:45	4.317842484
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5/24/2018 1:15	4.65577507
5/24/2018 1:30	28.79793358
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5/24/2018 2:00	28.55169868
5/24/2018 2:15	28.22317314
5/24/2018 2:30	27.65208817
5/24/2018 2:45	26.19615746
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5/24/2018 3:45	4.799380302
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5/24/2018 4:45	3.82424593
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5/24/2018 5:30	5.774828911
5/24/2018 5:45	11.93730736
5/24/2018 6:00	11.93730736
5/24/2018 6:15	13.62981319
5/24/2018 6:30	12.28439331
5/24/2018 6:45	11.80497837
5/24/2018 7:00	11.06575584
5/24/2018 7:15	11.06575584
5/24/2018 7:30	10.71030998
5/24/2018 7:45	10.32101536
5/24/2018 8:00	10.08038425
5/24/2018 8:15	9.642124176
5/24/2018 8:30	8.604369164
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5/24/2018 9:30	9.543485641
5/24/2018 9:45	9.398886681
5/24/2018 10:00	9.284837723
5/24/2018 10:15	7.522556305
5/24/2018 10:30	7.1148386
5/24/2018 10:45	6.86350584
5/24/2018 11:00	7.1148386
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5/24/2018 11:45	11.14799881
5/24/2018 12:00	12.82531166
5/24/2018 12:15	12.9145031
5/24/2018 12:30	15.72359943
5/24/2018 12:45	11.44423294

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5/24/2018 13:15	9.496006966
5/24/2018 13:30	10.56978703
5/24/2018 13:45	8.666625977
5/24/2018 14:00	8.666625977
5/24/2018 14:15	8.666625977
5/24/2018 14:30	8.247115135
5/24/2018 14:45	8.247115135
5/24/2018 15:00	9.455533028
5/24/2018 15:15	11.48161507
5/24/2018 15:30	11.48161507
5/24/2018 15:45	12.11628819
5/24/2018 16:00	11.48161507
5/24/2018 16:15	11.63511658
5/24/2018 16:30	12.11628819
5/24/2018 16:45	11.3709898
5/24/2018 17:00	11.3709898
5/24/2018 17:15	11.3709898
5/24/2018 17:30	19.45171547
5/24/2018 17:45	14.69172001
5/24/2018 18:00	14.69172001
5/24/2018 18:15	14.69172001
5/24/2018 18:30	17.29709244
5/24/2018 18:45	12.63903999
5/24/2018 19:00	10.72614002
5/24/2018 19:15	10.38756275
5/24/2018 19:30	10.38756275
5/24/2018 19:45	9.633049011
5/24/2018 20:00	9.633049011
5/24/2018 20:15	9.667403221
5/24/2018 20:30	9.667403221
5/24/2018 20:45	9.667403221
5/24/2018 21:00	12.65076733
5/24/2018 21:15	13.19485855
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5/24/2018 22:15	6.4890275
5/24/2018 22:30	5.268369198
5/24/2018 22:45	4.553829193
5/24/2018 23:00	4.27031374
5/24/2018 23:15	4.70247364
5/24/2018 23:30	4.70247364
5/24/2018 23:45	4.27031374
5/25/2018 0:00	4.27031374
5/25/2018 0:15	5.324429989
5/25/2018 0:30	3.848772764
5/25/2018 0:45	3.319104433
5/25/2018 1:00	3.351317883
5/25/2018 1:15	3.72317791
5/25/2018 1:30	3.651294708
5/25/2018 1:45	3.821584463
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5/25/2018 2:15	3.693843842
5/25/2018 2:30	3.693843842
5/25/2018 2:45	3.669290304
5/25/2018 3:00	3.669290304
5/25/2018 3:15	3.669290304
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5/25/2018 4:00	3.997551203
5/25/2018 4:15	4.012210846
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5/25/2018 5:00	7.185932636
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5/25/2018 5:45	5.990758419
5/25/2018 6:00	5.918648243
5/25/2018 6:15	5.918648243
5/25/2018 6:30	5.918648243
5/25/2018 6:45	8.676488876
5/25/2018 7:00	10.11713028
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5/25/2018 7:45	8.910154343
5/25/2018 8:00	9.71538353
5/25/2018 8:15	9.71538353
5/25/2018 8:30	7.826602459
5/25/2018 8:45	10.81747913
5/25/2018 9:00	16.3242321
5/25/2018 9:15	16.3242321
5/25/2018 9:30	15.37089157
5/25/2018 9:45	15.37089157
5/25/2018 10:00	9.189570427
5/25/2018 10:15	9.189570427
5/25/2018 10:30	8.365226746
5/25/2018 10:45	6.877946854
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5/25/2018 11:15	9.200283051
5/25/2018 11:30	8.886119843
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5/25/2018 12:30	15.90059566
5/25/2018 12:45	15.90059566

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5/25/2018 13:30	9.902047157
5/25/2018 13:45	9.902047157
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5/25/2018 17:00	9.455533028
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5/25/2018 17:45	7.863207817
5/25/2018 18:00	8.247115135
5/25/2018 18:15	8.247115135
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5/25/2018 19:30	12.15060043
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5/25/2018 20:00	12.25219631
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5/25/2018 20:45	13.46102333
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5/25/2018 21:15	12.07681561
5/25/2018 21:30	11.5712986
5/25/2018 21:45	11.5712986
5/25/2018 22:00	10.42115879
5/25/2018 22:15	6.080125809
5/25/2018 22:30	9.993649483
5/25/2018 22:45	6.548314571
5/25/2018 23:00	8.22533989
5/25/2018 23:15	6.761296749
5/25/2018 23:30	7.28345871
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5/26/2018 0:00	5.783007145
5/26/2018 0:15	5.783007145
5/26/2018 0:30	7.651535988
5/26/2018 0:45	10.05207825
5/26/2018 1:00	10.05207825
5/26/2018 1:15	7.425301075
5/26/2018 1:30	4.823437691
5/26/2018 1:45	4.489359379
5/26/2018 2:00	4.489359379
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5/26/2018 2:30	4.212288857
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5/26/2018 3:15	5.365705013
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5/26/2018 3:45	5.357077122
5/26/2018 4:00	3.933543205
5/26/2018 4:15	3.933543205
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5/26/2018 5:45	4.789570332
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5/26/2018 6:30	6.720778465
5/26/2018 6:45	5.883356571
5/26/2018 7:00	6.720778465
5/26/2018 7:15	6.720778465
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5/26/2018 8:30	11.25676727
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5/26/2018 9:00	11.25676727
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5/26/2018 9:45	11.44320393
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5/26/2018 11:00	16.28868866
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5/26/2018 12:15	9.239832878
5/26/2018 12:30	9.461623192
5/26/2018 12:45	8.694439888

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5/26/2018 13:30	7.492777348
5/26/2018 13:45	6.694926739
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5/26/2018 16:45	9.89875412
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5/26/2018 17:45	8.440140724
5/26/2018 18:00	19.22907066
5/26/2018 18:15	8.440140724
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5/26/2018 19:45	8.640089989
5/26/2018 20:00	9.689757347
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5/26/2018 20:30	8.289746284
5/26/2018 20:45	9.192873001
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5/26/2018 21:15	7.551296711
5/26/2018 21:30	7.798372269
5/26/2018 21:45	7.346201897
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5/26/2018 22:15	5.458687782
5/26/2018 22:30	5.481545448
5/26/2018 22:45	5.386825085
5/26/2018 23:00	4.637557507
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5/26/2018 23:45	4.265697956
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5/27/2018 1:00	3.850136518
5/27/2018 1:15	3.850136518
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5/27/2018 3:15	4.218013763
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5/27/2018 5:30	6.825880527
5/27/2018 5:45	6.918971062
5/27/2018 6:00	6.519536495
5/27/2018 6:15	6.519536495
5/27/2018 6:30	6.519536495
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5/27/2018 7:15	7.170599937
5/27/2018 7:30	6.825880527
5/27/2018 7:45	6.825880527
5/27/2018 8:00	6.825880527
5/27/2018 8:15	6.937458038
5/27/2018 8:30	9.601984978
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5/27/2018 9:30	10.53947639
5/27/2018 9:45	10.53947639
5/27/2018 10:00	9.102216721
5/27/2018 10:15	8.249228477
5/27/2018 10:30	8.223539352
5/27/2018 10:45	10.16508007
5/27/2018 11:00	6.904790401
5/27/2018 11:15	7.490477085
5/27/2018 11:30	5.938481331
5/27/2018 11:45	7.090051651
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5/27/2018 12:30	5.562446117
5/27/2018 12:45	5.659107685

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5/27/2018 13:30	6.252614498
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5/27/2018 14:00	8.124865532
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5/27/2018 14:30	7.597716331
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5/27/2018 16:00	9.349039078
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5/27/2018 17:45	7.572096825
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5/27/2018 22:45	6.533397675
5/27/2018 23:00	6.533397675
5/27/2018 23:15	6.184322357
5/27/2018 23:30	5.975507259
5/27/2018 23:45	4.273886204
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5/28/2018 0:15	3.970588923
5/28/2018 0:30	35.28310394
5/28/2018 0:45	36.04419708
5/28/2018 1:00	36.04419708
5/28/2018 1:15	32.13578415
5/28/2018 1:30	3.865370274
5/28/2018 1:45	3.453243017
5/28/2018 2:00	3.470888376
5/28/2018 2:15	3.367171049
5/28/2018 2:30	3.113880873
5/28/2018 2:45	3.418319941
5/28/2018 3:00	3.560950279
5/28/2018 3:15	3.560950279
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5/28/2018 4:15	4.148470879
5/28/2018 4:30	4.148470879
5/28/2018 4:45	4.656432629
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5/28/2018 6:00	4.998611927
5/28/2018 6:15	4.998611927
5/28/2018 6:30	5.569002151
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5/28/2018 11:45	9.792280197
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5/28/2018 12:30	9.408340454
5/28/2018 12:45	7.477096081

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5/28/2018 13:30	7.704547882
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5/28/2018 14:15	13.27067661
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5/28/2018 15:00	10.83857632
5/28/2018 15:15	8.984713554
5/28/2018 15:30	11.91293621
5/28/2018 15:45	7.965822697
5/28/2018 16:00	9.474401474
5/28/2018 16:15	8.444245338
5/28/2018 16:30	9.894748688
5/28/2018 16:45	10.09174728
5/28/2018 17:00	10.09174728
5/28/2018 17:15	8.390781403
5/28/2018 17:30	10.09174728
5/28/2018 17:45	8.167097092
5/28/2018 18:00	8.167097092
5/28/2018 18:15	9.28757
5/28/2018 18:30	9.28757
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5/28/2018 19:00	9.969192505
5/28/2018 19:15	12.00786972
5/28/2018 19:30	10.94015026
5/28/2018 19:45	12.23129654
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5/28/2018 20:15	7.897726536
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5/28/2018 22:00	7.533687115
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5/28/2018 22:30	5.318383217
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5/28/2018 23:00	7.791596413
5/28/2018 23:15	4.998388767
5/28/2018 23:30	5.190689564
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5/29/2018 2:15	4.560425282
5/29/2018 2:30	3.845215559
5/29/2018 2:45	3.830399513
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5/29/2018 3:15	4.381237507
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5/29/2018 3:45	4.213376045
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5/29/2018 7:45	9.200903893
5/29/2018 8:00	9.200903893
5/29/2018 8:15	9.783625603
5/29/2018 8:30	9.060492516
5/29/2018 8:45	9.060492516
5/29/2018 9:00	10.80173588
5/29/2018 9:15	11.47786713
5/29/2018 9:30	9.961051941
5/29/2018 9:45	8.101874352
5/29/2018 10:00	8.101874352
5/29/2018 10:15	8.101874352
5/29/2018 10:30	7.753665447
5/29/2018 10:45	10.5257988
5/29/2018 11:00	11.92376518
5/29/2018 11:15	12.22597027
5/29/2018 11:30	11.7621069
5/29/2018 11:45	12.060215
5/29/2018 12:00	10.87305927
5/29/2018 12:15	11.5949049
5/29/2018 12:30	11.74314499
5/29/2018 12:45	13.19884014

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5/29/2018 13:15	13.19884014
5/29/2018 13:30	11.6155386
5/29/2018 13:45	10.61695385
5/29/2018 14:00	10.33374786
5/29/2018 14:15	10.04636192
5/29/2018 14:30	8.738195419
5/29/2018 14:45	7.6926651
5/29/2018 15:00	9.267228127
5/29/2018 15:15	8.466410637
5/29/2018 15:30	8.422615051
5/29/2018 15:45	9.267228127
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5/29/2018 16:15	9.334891319
5/29/2018 16:30	9.334891319
5/29/2018 16:45	9.667095184
5/29/2018 17:00	7.783909321
5/29/2018 17:15	7.516187668
5/29/2018 17:30	5.626634121
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5/29/2018 18:00	5.626634121
5/29/2018 18:15	6.148577213
5/29/2018 18:30	8.454414368
5/29/2018 18:45	14.60673809
5/29/2018 19:00	14.60673809
5/29/2018 19:15	11.48702908
5/29/2018 19:30	11.14178658
5/29/2018 19:45	8.184475899
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5/29/2018 20:30	6.474236488
5/29/2018 20:45	7.504144192
5/29/2018 21:00	11.84305573
5/29/2018 21:15	6.782616615
5/29/2018 21:30	7.07007122
5/29/2018 21:45	7.261401653
5/29/2018 22:00	8.287023544
5/29/2018 22:15	7.193747997
5/29/2018 22:30	7.193747997
5/29/2018 22:45	7.023412704
5/29/2018 23:00	6.678156376
5/29/2018 23:15	6.57695055
5/29/2018 23:30	6.57695055
5/29/2018 23:45	5.392051697
5/30/2018 0:00	5.405870438
5/30/2018 0:15	5.060155869
5/30/2018 0:30	4.185873032
5/30/2018 0:45	4.185873032
5/30/2018 1:00	4.750132084
5/30/2018 1:15	9.387248993
5/30/2018 1:30	9.556196213
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5/30/2018 2:15	4.066966534
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5/30/2018 3:00	3.278770924
5/30/2018 3:15	3.590967894
5/30/2018 3:30	3.778386593
5/30/2018 3:45	3.742159843
5/30/2018 4:00	3.316658735
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5/30/2018 4:45	3.764608145
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5/30/2018 5:15	4.228164196
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5/30/2018 5:45	5.729567528
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5/30/2018 6:15	7.783909321
5/30/2018 6:30	9.162283897
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5/30/2018 7:00	9.162283897
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5/30/2018 7:45	8.077776909
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5/30/2018 8:15	7.842023373
5/30/2018 8:30	7.789119244
5/30/2018 8:45	7.789119244
5/30/2018 9:00	8.549239159
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5/30/2018 9:30	12.76765156
5/30/2018 9:45	10.2382679
5/30/2018 10:00	12.05023193
5/30/2018 10:15	12.05023193
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5/30/2018 12:15	8.703682899
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5/30/2018 12:45	11.18968296

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5/30/2018 13:30	8.352968216
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5/30/2018 14:00	8.352968216
5/30/2018 14:15	8.528842926
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5/30/2018 15:45	10.58015537
5/30/2018 16:00	9.129728317
5/30/2018 16:15	10.58015537
5/30/2018 16:30	9.129728317
5/30/2018 16:45	9.129728317
5/30/2018 17:00	9.129728317
5/30/2018 17:15	7.869868279
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5/30/2018 17:45	7.869868279
5/30/2018 18:00	7.869868279
5/30/2018 18:15	7.869868279
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5/30/2018 19:15	11.6497488
5/30/2018 19:30	11.6497488
5/30/2018 19:45	8.288859367
5/30/2018 20:00	7.505286217
5/30/2018 20:15	7.505286217
5/30/2018 20:30	7.734744072
5/30/2018 20:45	8.034606934
5/30/2018 21:00	8.547825813
5/30/2018 21:15	8.547825813
5/30/2018 21:30	8.547825813
5/30/2018 21:45	8.547825813
5/30/2018 22:00	6.948159695
5/30/2018 22:15	7.397201538
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5/30/2018 22:45	5.541266918
5/30/2018 23:00	5.820654392
5/30/2018 23:15	5.184641361
5/30/2018 23:30	5.820654392
5/30/2018 23:45	4.94810915
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5/31/2018 0:30	3.789922476
5/31/2018 0:45	3.496700764
5/31/2018 1:00	3.598222017
5/31/2018 1:15	3.789922476
5/31/2018 1:30	4.233711243
5/31/2018 1:45	4.567491531
5/31/2018 2:00	4.465031624
5/31/2018 2:15	4.164988995
5/31/2018 2:30	3.348337412
5/31/2018 2:45	3.425172329
5/31/2018 3:00	3.273808479
5/31/2018 3:15	3.689098835
5/31/2018 3:30	4.547444344
5/31/2018 3:45	5.47274828
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5/31/2018 4:15	5.184289455
5/31/2018 4:30	5.47274828
5/31/2018 4:45	5.619621754
5/31/2018 5:00	5.648823261
5/31/2018 5:15	6.631321907
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5/31/2018 6:30	7.489067554
5/31/2018 6:45	10.99373913
5/31/2018 7:00	10.99373913
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5/31/2018 7:45	10.99373913
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5/31/2018 8:30	7.802698135
5/31/2018 8:45	8.75650692
5/31/2018 9:00	8.991398811
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5/31/2018 9:30	11.44726276
5/31/2018 9:45	11.44726276
5/31/2018 10:00	8.220381737
5/31/2018 10:15	8.220381737
5/31/2018 10:30	8.220381737
5/31/2018 10:45	8.309423447
5/31/2018 11:00	11.01780128
5/31/2018 11:15	13.3932209
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5/31/2018 12:00	11.03257656
5/31/2018 12:15	12.04932404
5/31/2018 12:30	10.90399742
5/31/2018 12:45	10.90399742

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5/31/2018 13:15	12.52861786
5/31/2018 13:30	12.91789246
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5/31/2018 14:00	12.58209229
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5/31/2018 14:30	10.85965824
5/31/2018 14:45	12.08645725
5/31/2018 15:00	12.08645725
5/31/2018 15:15	12.62939167
5/31/2018 15:30	10.89831161
5/31/2018 15:45	20.34623337
5/31/2018 16:00	22.03107262
5/31/2018 16:15	22.69094849
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5/31/2018 19:30	11.45247841
5/31/2018 19:45	8.522317886
5/31/2018 20:00	12.45506573
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5/31/2018 20:30	8.225893974
5/31/2018 20:45	8.303295135
5/31/2018 21:00	9.000936508
5/31/2018 21:15	8.303295135
5/31/2018 21:30	7.874836445
5/31/2018 21:45	8.54668808
5/31/2018 22:00	5.893904209
5/31/2018 22:15	5.438640118
5/31/2018 22:30	5.222825527
5/31/2018 22:45	5.222825527
5/31/2018 23:00	5.222825527
5/31/2018 23:15	6.265865803
5/31/2018 23:30	6.265865803
5/31/2018 23:45	6.265865803
6/1/2018 0:00	4.725218773
6/1/2018 0:15	4.774292469
6/1/2018 0:30	4.420075893
6/1/2018 0:45	4.627831459
6/1/2018 1:00	5.236184597
6/1/2018 1:15	4.872714043
6/1/2018 1:30	4.872714043
6/1/2018 1:45	4.872714043
6/1/2018 2:00	4.872714043
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6/1/2018 2:45	3.650590181
6/1/2018 3:00	3.498348475
6/1/2018 3:15	3.161308765
6/1/2018 3:30	3.498348475
6/1/2018 3:45	3.455918074
6/1/2018 4:00	3.627664566
6/1/2018 4:15	5.312875271
6/1/2018 4:30	5.672471523
6/1/2018 4:45	4.520782948
6/1/2018 5:00	5.700288773
6/1/2018 5:15	5.448272228
6/1/2018 5:30	5.935376644
6/1/2018 5:45	6.274766922
6/1/2018 6:00	6.274766922
6/1/2018 6:15	7.295758724
6/1/2018 6:30	8.05096817
6/1/2018 6:45	7.829141617
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6/1/2018 8:00	8.891324043
6/1/2018 8:15	9.644122124
6/1/2018 8:30	8.465223312
6/1/2018 8:45	8.875021935
6/1/2018 9:00	10.2244854
6/1/2018 9:15	7.864331245
6/1/2018 9:30	8.292039871
6/1/2018 9:45	16.11597633
6/1/2018 10:00	16.11597633
6/1/2018 10:15	11.20734596
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6/1/2018 11:30	7.695032597
6/1/2018 11:45	10.79468727
6/1/2018 12:00	12.37374306
6/1/2018 12:15	13.58525372
6/1/2018 12:30	13.58525372
6/1/2018 12:45	13.58525372

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6/1/2018 13:30	10.41654301
6/1/2018 13:45	10.41654301
6/1/2018 14:00	8.697299004
6/1/2018 14:15	9.674918175
6/1/2018 14:30	9.674918175
6/1/2018 14:45	9.273356438
6/1/2018 15:00	9.273356438
6/1/2018 15:15	9.273356438
6/1/2018 15:30	9.273356438
6/1/2018 15:45	9.688177109
6/1/2018 16:00	10.65836143
6/1/2018 16:15	10.10015297
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6/1/2018 16:45	9.688177109
6/1/2018 17:00	7.895896912
6/1/2018 17:15	7.652794838
6/1/2018 17:30	7.652794838
6/1/2018 17:45	7.237557411
6/1/2018 18:00	7.457230091
6/1/2018 18:15	7.563506126
6/1/2018 18:30	11.10979748
6/1/2018 18:45	8.159092903
6/1/2018 19:00	9.539129257
6/1/2018 19:15	8.395265579
6/1/2018 19:30	9.539129257
6/1/2018 19:45	8.395265579
6/1/2018 20:00	9.539129257
6/1/2018 20:15	10.25318527
6/1/2018 20:30	10.25318527
6/1/2018 20:45	9.412541389
6/1/2018 21:00	10.25318527
6/1/2018 21:15	9.412541389
6/1/2018 21:30	7.321857452
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6/1/2018 22:00	7.294997215
6/1/2018 22:15	5.610217571
6/1/2018 22:30	5.610217571
6/1/2018 22:45	6.527079105
6/1/2018 23:00	6.527079105
6/1/2018 23:15	4.935919762
6/1/2018 23:30	6.527079105
6/1/2018 23:45	4.697501183
6/2/2018 0:00	4.697501183
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6/2/2018 0:30	4.878174782
6/2/2018 0:45	4.697501183
6/2/2018 1:00	4.710123062
6/2/2018 1:15	4.388971329
6/2/2018 1:30	4.042982578
6/2/2018 1:45	3.901954889
6/2/2018 2:00	4.042982578
6/2/2018 2:15	4.497169495
6/2/2018 2:30	4.956676006
6/2/2018 2:45	4.956676006
6/2/2018 3:00	4.118720055
6/2/2018 3:15	2.900952339
6/2/2018 3:30	2.993647575
6/2/2018 3:45	2.993647575
6/2/2018 4:00	2.900952339
6/2/2018 4:15	3.272632122
6/2/2018 4:30	3.729597092
6/2/2018 4:45	4.205554962
6/2/2018 5:00	3.880680799
6/2/2018 5:15	4.205554962
6/2/2018 5:30	4.530257225
6/2/2018 5:45	4.099364281
6/2/2018 6:00	4.099364281
6/2/2018 6:15	5.853079796
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6/2/2018 8:00	7.918601513
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6/2/2018 8:30	7.809460163
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6/2/2018 9:45	8.323631287
6/2/2018 10:00	8.323631287
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6/2/2018 10:30	9.974069595
6/2/2018 10:45	9.898579597
6/2/2018 11:00	7.81373167
6/2/2018 11:15	7.81373167
6/2/2018 11:30	14.85496044
6/2/2018 11:45	8.731010437
6/2/2018 12:00	8.731010437
6/2/2018 12:15	11.94299984
6/2/2018 12:30	11.94299984
6/2/2018 12:45	11.94299984

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6/2/2018 13:30	6.931502342
6/2/2018 13:45	7.200582981
6/2/2018 14:00	7.200582981
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6/2/2018 15:00	12.85091496
6/2/2018 15:15	12.867486
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6/2/2018 16:00	7.600265503
6/2/2018 16:15	7.600265503
6/2/2018 16:30	8.055058479
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6/2/2018 17:15	6.963693142
6/2/2018 17:30	9.656740189
6/2/2018 17:45	7.655578613
6/2/2018 18:00	7.37239027
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6/2/2018 18:30	8.27299118
6/2/2018 18:45	7.655578613
6/2/2018 19:00	6.90755415
6/2/2018 19:15	7.655078888
6/2/2018 19:30	6.00097847
6/2/2018 19:45	6.00097847
6/2/2018 20:00	7.574956417
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6/2/2018 20:30	6.495779514
6/2/2018 20:45	7.360229015
6/2/2018 21:00	6.601482391
6/2/2018 21:15	5.721187592
6/2/2018 21:30	6.601482391
6/2/2018 21:45	7.782504559
6/2/2018 22:00	6.452244282
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6/2/2018 22:45	6.615671635
6/2/2018 23:00	5.131144047
6/2/2018 23:15	4.936389446
6/2/2018 23:30	4.150511265
6/2/2018 23:45	4.150511265
6/3/2018 0:00	3.691059113
6/3/2018 0:15	3.773963213
6/3/2018 0:30	3.82405591
6/3/2018 0:45	3.82405591
6/3/2018 1:00	3.82405591
6/3/2018 1:15	3.82405591
6/3/2018 1:30	4.147580147
6/3/2018 1:45	3.504271984
6/3/2018 2:00	4.007798672
6/3/2018 2:15	4.065389633
6/3/2018 2:30	3.906571388
6/3/2018 2:45	3.827908039
6/3/2018 3:00	3.827908039
6/3/2018 3:15	3.815860748
6/3/2018 3:30	3.660582304
6/3/2018 3:45	3.431522131
6/3/2018 4:00	3.320107698
6/3/2018 4:15	3.039479733
6/3/2018 4:30	3.107671499
6/3/2018 4:45	3.107671499
6/3/2018 5:00	3.734525442
6/3/2018 5:15	3.734525442
6/3/2018 5:30	4.432955265
6/3/2018 5:45	4.964692593
6/3/2018 6:00	6.74065733
6/3/2018 6:15	4.958362103
6/3/2018 6:30	6.74065733
6/3/2018 6:45	6.459374428
6/3/2018 7:00	6.459374428
6/3/2018 7:15	10.54265976
6/3/2018 7:30	10.54265976
6/3/2018 7:45	10.54265976
6/3/2018 8:00	10.67126942
6/3/2018 8:15	18.7614975
6/3/2018 8:30	13.42439938
6/3/2018 8:45	18.7614975
6/3/2018 9:00	16.6963501
6/3/2018 9:15	19.76839066
6/3/2018 9:30	15.74048996
6/3/2018 9:45	15.85987854
6/3/2018 10:00	12.97569275
6/3/2018 10:15	12.09494209
6/3/2018 10:30	6.29805851
6/3/2018 10:45	6.29805851
6/3/2018 11:00	6.29805851
6/3/2018 11:15	7.769510269
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6/3/2018 11:45	9.565075874
6/3/2018 12:00	9.565075874
6/3/2018 12:15	9.329223633
6/3/2018 12:30	9.291017532
6/3/2018 12:45	9.253960609

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6/3/2018 13:00	8.678853989
6/3/2018 13:15	8.115190506
6/3/2018 13:30	7.650971413
6/3/2018 13:45	7.51679039
6/3/2018 14:00	7.409574986
6/3/2018 14:15	7.895913124
6/3/2018 14:30	8.251419067
6/3/2018 14:45	9.827265739
6/3/2018 15:00	11.62300491
6/3/2018 15:15	11.62300491
6/3/2018 15:30	11.12527561
6/3/2018 15:45	11.12527561
6/3/2018 16:00	11.62300491
6/3/2018 16:15	7.594181061
6/3/2018 16:30	16.9663105
6/3/2018 16:45	10.88305187
6/3/2018 17:00	8.37948513
6/3/2018 17:15	8.685649872
6/3/2018 17:30	10.79856014
6/3/2018 17:45	8.909578323
6/3/2018 18:00	10.33114624
6/3/2018 18:15	10.33114624
6/3/2018 18:30	7.923862457
6/3/2018 18:45	7.923862457
6/3/2018 19:00	10.57740784
6/3/2018 19:15	8.05490303
6/3/2018 19:30	13.77659607
6/3/2018 19:45	13.77659607
6/3/2018 20:00	8.796646118
6/3/2018 20:15	8.796646118
6/3/2018 20:30	8.969573021
6/3/2018 20:45	8.969573021
6/3/2018 21:00	9.676269531
6/3/2018 21:15	9.676269531
6/3/2018 21:30	8.291582108
6/3/2018 21:45	8.259977341
6/3/2018 22:00	7.532138824
6/3/2018 22:15	7.293546677
6/3/2018 22:30	7.532138824
6/3/2018 22:45	5.544324398
6/3/2018 23:00	4.518771648
6/3/2018 23:15	4.247982979
6/3/2018 23:30	5.392363071
6/3/2018 23:45	5.164690495
6/4/2018 0:00	3.562927008
6/4/2018 0:15	3.425999165
6/4/2018 0:30	3.977987766
6/4/2018 0:45	3.977987766
6/4/2018 1:00	3.44374752
6/4/2018 1:15	3.940747499
6/4/2018 1:30	4.038570881
6/4/2018 1:45	3.621902704
6/4/2018 2:00	3.621902704
6/4/2018 2:15	3.621902704
6/4/2018 2:30	3.621902704
6/4/2018 2:45	3.165729284
6/4/2018 3:00	3.165729284
6/4/2018 3:15	2.708261728
6/4/2018 3:30	2.931575775
6/4/2018 3:45	2.931575775
6/4/2018 4:00	2.931575775
6/4/2018 4:15	3.588900566
6/4/2018 4:30	3.738977194
6/4/2018 4:45	4.211009502
6/4/2018 5:00	5.059616089
6/4/2018 5:15	5.059616089
6/4/2018 5:30	5.059616089
6/4/2018 5:45	6.336004734
6/4/2018 6:00	5.720992088
6/4/2018 6:15	5.720992088
6/4/2018 6:30	7.234824657
6/4/2018 6:45	5.720992088
6/4/2018 7:00	5.720992088
6/4/2018 7:15	10.05440521
6/4/2018 7:30	12.44865608
6/4/2018 7:45	13.45562172
6/4/2018 8:00	13.45562172
6/4/2018 8:15	13.45562172
6/4/2018 8:30	11.70538902
6/4/2018 8:45	10.72817421
6/4/2018 9:00	9.988838196
6/4/2018 9:15	10.37744522
6/4/2018 9:30	10.37744522
6/4/2018 9:45	10.37744522
6/4/2018 10:00	10.96440506
6/4/2018 10:15	10.72835064
6/4/2018 10:30	11.24334431
6/4/2018 10:45	8.162231445
6/4/2018 11:00	11.52346897
6/4/2018 11:15	11.52346897
6/4/2018 11:30	11.52346897
6/4/2018 11:45	11.52346897
6/4/2018 12:00	11.52346897
6/4/2018 12:15	13.6094532
6/4/2018 12:30	13.6094532
6/4/2018 12:45	13.6094532

Site 17 – MH 18.02 Flow Meter Data

6/4/2018 13:00	9.256604195
6/4/2018 13:15	8.546045303
6/4/2018 13:30	8.43385601
6/4/2018 13:45	7.942664146
6/4/2018 14:00	8.43385601
6/4/2018 14:15	7.230499744
6/4/2018 14:30	8.016726494
6/4/2018 14:45	8.016726494
6/4/2018 15:00	8.546045303
6/4/2018 15:15	8.849761009
6/4/2018 15:30	10.30310154
6/4/2018 15:45	10.39646244
6/4/2018 16:00	12.64649868
6/4/2018 16:15	11.36091518
6/4/2018 16:30	13.27147293
6/4/2018 16:45	13.27147293
6/4/2018 17:00	13.294631
6/4/2018 17:15	11.73469353
6/4/2018 17:30	11.73469353
6/4/2018 17:45	11.73469353
6/4/2018 18:00	8.702403069
6/4/2018 18:15	8.034280777
6/4/2018 18:30	8.174571037
6/4/2018 18:45	9.269170761
6/4/2018 19:00	9.054186821
6/4/2018 19:15	8.705516815
6/4/2018 19:30	9.289570808
6/4/2018 19:45	9.510144234
6/4/2018 20:00	9.171660423
6/4/2018 20:15	9.450533867
6/4/2018 20:30	9.450533867
6/4/2018 20:45	8.063556671
6/4/2018 21:00	6.018323421
6/4/2018 21:15	6.018323421
6/4/2018 21:30	6.018323421
6/4/2018 21:45	6.190933704
6/4/2018 22:00	6.190933704
6/4/2018 22:15	7.116324902
6/4/2018 22:30	7.258908749
6/4/2018 22:45	6.839942455
6/4/2018 23:00	6.638833523
6/4/2018 23:15	6.638833523
6/4/2018 23:30	5.822935104
6/4/2018 23:45	5.656420231
6/5/2018 0:00	5.059651852
6/5/2018 0:15	4.611697674
6/5/2018 0:30	4.114104271
6/5/2018 0:45	3.693611622
6/5/2018 1:00	3.693611622
6/5/2018 1:15	3.461642504
6/5/2018 1:30	3.75087738
6/5/2018 1:45	4.27361536
6/5/2018 2:00	4.27361536
6/5/2018 2:15	4.27361536
6/5/2018 2:30	4.20194149
6/5/2018 2:45	4.08485508
6/5/2018 3:00	3.036881685
6/5/2018 3:15	3.024976015
6/5/2018 3:30	3.299294949
6/5/2018 3:45	3.812021494
6/5/2018 4:00	3.452784061
6/5/2018 4:15	3.676366091
6/5/2018 4:30	3.904446363
6/5/2018 4:45	4.69221735
6/5/2018 5:00	4.69221735
6/5/2018 5:15	5.305821896
6/5/2018 5:30	5.478545189
6/5/2018 5:45	5.478545189
6/5/2018 6:00	6.583284855
6/5/2018 6:15	6.5374403
6/5/2018 6:30	6.762869835
6/5/2018 6:45	6.762869835
6/5/2018 7:00	8.854347229
6/5/2018 7:15	9.948648453
6/5/2018 7:30	10.30950069
6/5/2018 7:45	10.30950069

Site 18 – MH 19.05 Flow Meter Data

Inst Time	Flow (gpm)
5/11/2018 13:45	0
5/11/2018 14:00	9.209410667
5/11/2018 14:15	47.47372437
5/11/2018 14:30	67.85559082
5/11/2018 14:45	176.8540497
5/11/2018 15:00	177.7241974
5/11/2018 15:15	178.0054321
5/11/2018 15:30	185.9115906
5/11/2018 15:45	0
5/11/2018 16:00	0
5/11/2018 16:15	0
5/11/2018 16:30	0
5/11/2018 16:45	0
5/11/2018 17:00	0
5/11/2018 17:15	0
5/11/2018 17:30	0
5/11/2018 17:45	0
5/11/2018 18:00	0
5/11/2018 18:15	0
5/11/2018 18:30	0
5/11/2018 18:45	0
5/11/2018 19:00	0
5/11/2018 19:15	0
5/11/2018 19:30	0
5/11/2018 19:45	0
5/11/2018 20:00	0
5/11/2018 20:15	0
5/11/2018 20:30	0
5/11/2018 20:45	0
5/11/2018 21:00	0
5/11/2018 21:15	0
5/11/2018 21:30	0
5/11/2018 21:45	0
5/11/2018 22:00	0
5/11/2018 22:15	0
5/11/2018 22:30	0
5/11/2018 22:45	0
5/11/2018 23:00	0
5/11/2018 23:15	0
5/11/2018 23:30	0
5/11/2018 23:45	0
5/12/2018 0:00	0
5/12/2018 0:15	0
5/12/2018 0:30	0
5/12/2018 0:45	0
5/12/2018 1:00	0
5/12/2018 1:15	0
5/12/2018 1:30	0
5/12/2018 1:45	0
5/12/2018 2:00	0
5/12/2018 2:15	0
5/12/2018 2:30	0
5/12/2018 2:45	0
5/12/2018 3:00	0
5/12/2018 3:15	0
5/12/2018 3:30	0
5/12/2018 3:45	0
5/12/2018 4:00	0
5/12/2018 4:15	0
5/12/2018 4:30	0
5/12/2018 4:45	0
5/12/2018 5:00	112.6151199
5/12/2018 5:15	179.7227173
5/12/2018 5:30	162.2167358
5/12/2018 5:45	193.7897797
5/12/2018 6:00	212.2179871
5/12/2018 6:15	177.1923828
5/12/2018 6:30	0
5/12/2018 6:45	0
5/12/2018 7:00	0
5/12/2018 7:15	0
5/12/2018 7:30	0
5/12/2018 7:45	0
5/12/2018 8:00	0
5/12/2018 8:15	0
5/12/2018 8:30	0
5/12/2018 8:45	0
5/12/2018 9:00	0
5/12/2018 9:15	0
5/12/2018 9:30	0
5/12/2018 9:45	0
5/12/2018 10:00	0
5/12/2018 10:15	0
5/12/2018 10:30	0
5/12/2018 10:45	0
5/12/2018 11:00	0
5/12/2018 11:15	0
5/12/2018 11:30	0
5/12/2018 11:45	0
5/12/2018 12:00	0
5/12/2018 12:15	0
5/12/2018 12:30	0
5/12/2018 12:45	0
5/12/2018 13:00	0
5/12/2018 13:15	0

Site 18 – MH 19.05 Flow Meter Data

5/12/2018 13:30	0
5/12/2018 13:45	9.543600082
5/12/2018 14:00	13.58024311
5/12/2018 14:15	12.5100565
5/12/2018 14:30	13.40949154
5/12/2018 14:45	11.46785164
5/12/2018 15:00	11.8646431
5/12/2018 15:15	11.09955406
5/12/2018 15:30	9.504812241
5/12/2018 15:45	9.861842155
5/12/2018 16:00	10.00629616
5/12/2018 16:15	8.074792862
5/12/2018 16:30	8.074792862
5/12/2018 16:45	9.235301971
5/12/2018 17:00	8.137459755
5/12/2018 17:15	8.137459755
5/12/2018 17:30	9.308074951
5/12/2018 17:45	9.523990631
5/12/2018 18:00	9.523990631
5/12/2018 18:15	9.623859406
5/12/2018 18:30	9.260551453
5/12/2018 18:45	9.556376457
5/12/2018 19:00	9.659769058
5/12/2018 19:15	11.66252041
5/12/2018 19:30	11.66252041
5/12/2018 19:45	12.47124863
5/12/2018 20:00	12.47124863
5/12/2018 20:15	11.89687729
5/12/2018 20:30	9.059323311
5/12/2018 20:45	7.646884918
5/12/2018 21:00	7.992683887
5/12/2018 21:15	7.471178055
5/12/2018 21:30	7.307321072
5/12/2018 21:45	7.568228245
5/12/2018 22:00	7.649444103
5/12/2018 22:15	8.390906334
5/12/2018 22:30	10.55658531
5/12/2018 22:45	10.95813274
5/12/2018 23:00	10.95813274
5/12/2018 23:15	10.95813274
5/12/2018 23:30	0
5/12/2018 23:45	0
5/13/2018 0:00	0
5/13/2018 0:15	0
5/13/2018 0:30	0
5/13/2018 0:45	0
5/13/2018 1:00	0
5/13/2018 1:15	0
5/13/2018 1:30	0
5/13/2018 1:45	0
5/13/2018 2:00	0
5/13/2018 2:15	0
5/13/2018 2:30	0
5/13/2018 2:45	0
5/13/2018 3:00	0
5/13/2018 3:15	0
5/13/2018 3:30	0
5/13/2018 3:45	0
5/13/2018 4:00	0
5/13/2018 4:15	0
5/13/2018 4:30	0
5/13/2018 4:45	0
5/13/2018 5:00	0
5/13/2018 5:15	0
5/13/2018 5:30	0
5/13/2018 5:45	0
5/13/2018 6:00	0
5/13/2018 6:15	5.181073189
5/13/2018 6:30	9.88561821
5/13/2018 6:45	7.262727737
5/13/2018 7:00	9.88561821
5/13/2018 7:15	9.786911964
5/13/2018 7:30	9.220389366
5/13/2018 7:45	9.818047523
5/13/2018 8:00	10.84340668
5/13/2018 8:15	11.0707283
5/13/2018 8:30	10.82497406
5/13/2018 8:45	11.93172264
5/13/2018 9:00	10.04650784
5/13/2018 9:15	10.04650784
5/13/2018 9:30	10.21017647
5/13/2018 9:45	12.33907413
5/13/2018 10:00	9.533079147
5/13/2018 10:15	9.533079147
5/13/2018 10:30	7.311734676
5/13/2018 10:45	7.095822811
5/13/2018 11:00	7.095822811
5/13/2018 11:15	7.227958679
5/13/2018 11:30	9.124456406
5/13/2018 11:45	10.13353539
5/13/2018 12:00	11.68287468
5/13/2018 12:15	11.86268234
5/13/2018 12:30	11.36140156
5/13/2018 12:45	10.70824242
5/13/2018 13:00	267.688385
5/13/2018 13:15	256.5510864

Site 18 – MH 19.05 Flow Meter Data

5/13/2018 13:30	260.5029602
5/13/2018 13:45	262.5599976
5/13/2018 14:00	0
5/13/2018 14:15	5.892689705
5/13/2018 14:30	11.78537941
5/13/2018 14:45	7.602359772
5/13/2018 15:00	8.00566864
5/13/2018 15:15	9.610738754
5/13/2018 15:30	9.326360703
5/13/2018 15:45	9.326360703
5/13/2018 16:00	9.646549225
5/13/2018 16:15	10.33694744
5/13/2018 16:30	11.51232338
5/13/2018 16:45	11.51232338
5/13/2018 17:00	12.7400074
5/13/2018 17:15	21.8394165
5/13/2018 17:30	21.8394165
5/13/2018 17:45	16.83225441
5/13/2018 18:00	16.83225441
5/13/2018 18:15	15.35940075
5/13/2018 18:30	0
5/13/2018 18:45	0
5/13/2018 19:00	0
5/13/2018 19:15	8.288092613
5/13/2018 19:30	9.681785583
5/13/2018 19:45	9.019495964
5/13/2018 20:00	8.348800659
5/13/2018 20:15	9.182603836
5/13/2018 20:30	9.941718102
5/13/2018 20:45	7.472032547
5/13/2018 21:00	7.465691566
5/13/2018 21:15	7.353269577
5/13/2018 21:30	7.353269577
5/13/2018 21:45	7.353269577
5/13/2018 22:00	0
5/13/2018 22:15	4.479725838
5/13/2018 22:30	8.342907906
5/13/2018 22:45	6.453974724
5/13/2018 23:00	8.317944527
5/13/2018 23:15	8.317944527
5/13/2018 23:30	8.204964638
5/13/2018 23:45	7.264400959
5/14/2018 0:00	7.264400959
5/14/2018 0:15	6.868306637
5/14/2018 0:30	6.985839844
5/14/2018 0:45	7.146225929
5/14/2018 1:00	7.263674736
5/14/2018 1:15	7.146225929
5/14/2018 1:30	7.146225929
5/14/2018 1:45	6.601668358
5/14/2018 2:00	6.601668358
5/14/2018 2:15	6.511464119
5/14/2018 2:30	6.44332552
5/14/2018 2:45	6.44332552
5/14/2018 3:00	6.492730141
5/14/2018 3:15	7.110208511
5/14/2018 3:30	7.49771452
5/14/2018 3:45	7.49771452
5/14/2018 4:00	7.769380569
5/14/2018 4:15	8.149007797
5/14/2018 4:30	9.677138329
5/14/2018 4:45	8.337663651
5/14/2018 5:00	8.149007797
5/14/2018 5:15	8.81578064
5/14/2018 5:30	7.961751938
5/14/2018 5:45	7.961751938
5/14/2018 6:00	8.759608269
5/14/2018 6:15	9.935608864
5/14/2018 6:30	8.759608269
5/14/2018 6:45	10.34209919
5/14/2018 7:00	10.6546545
5/14/2018 7:15	10.86441803
5/14/2018 7:30	10.86441803
5/14/2018 7:45	10.71166611
5/14/2018 8:00	10.29912663
5/14/2018 8:15	9.57254982
5/14/2018 8:30	8.382317543
5/14/2018 8:45	9.92777729
5/14/2018 9:00	8.728144646
5/14/2018 9:15	8.462458611
5/14/2018 9:30	8.083852768
5/14/2018 9:45	9.266898155
5/14/2018 10:00	9.266898155
5/14/2018 10:15	8.822059631
5/14/2018 10:30	10.21297646
5/14/2018 10:45	10.21297646
5/14/2018 11:00	10.21297646
5/14/2018 11:15	10.41354561
5/14/2018 11:30	0
5/14/2018 11:45	0
5/14/2018 12:00	0
5/14/2018 12:15	0
5/14/2018 12:30	0
5/14/2018 12:45	0
5/14/2018 13:00	0
5/14/2018 13:15	0

Site 18 – MH 19.05 Flow Meter Data

5/14/2018 13:30	0
5/14/2018 13:45	0
5/14/2018 14:00	0
5/14/2018 14:15	0
5/14/2018 14:30	0
5/14/2018 14:45	0
5/14/2018 15:00	0
5/14/2018 15:15	0
5/14/2018 15:30	0
5/14/2018 15:45	0
5/14/2018 16:00	5.54160738
5/14/2018 16:15	11.08321476
5/14/2018 16:30	10.82919598
5/14/2018 16:45	16.23232651
5/14/2018 17:00	19.89494896
5/14/2018 17:15	19.89494896
5/14/2018 17:30	0
5/14/2018 17:45	0
5/14/2018 18:00	0
5/14/2018 18:15	0
5/14/2018 18:30	0
5/14/2018 18:45	0
5/14/2018 19:00	0
5/14/2018 19:15	0
5/14/2018 19:30	0
5/14/2018 19:45	0
5/14/2018 20:00	0
5/14/2018 20:15	0
5/14/2018 20:30	0
5/14/2018 20:45	0
5/14/2018 21:00	0
5/14/2018 21:15	0
5/14/2018 21:30	13.05181217
5/14/2018 21:45	9.271945953
5/14/2018 22:00	7.554397583
5/14/2018 22:15	10.42346859
5/14/2018 22:30	11.29118156
5/14/2018 22:45	11.70948887
5/14/2018 23:00	12.51570511
5/14/2018 23:15	12.97204018
5/14/2018 23:30	0
5/14/2018 23:45	0
5/15/2018 0:00	0
5/15/2018 0:15	0
5/15/2018 0:30	0
5/15/2018 0:45	0
5/15/2018 1:00	0
5/15/2018 1:15	0
5/15/2018 1:30	0
5/15/2018 1:45	0
5/15/2018 2:00	0
5/15/2018 2:15	0
5/15/2018 2:30	0
5/15/2018 2:45	0
5/15/2018 3:00	0
5/15/2018 3:15	0
5/15/2018 3:30	0
5/15/2018 3:45	0
5/15/2018 4:00	193.1540527
5/15/2018 4:15	17.68356705
5/15/2018 4:30	106.0048981
5/15/2018 4:45	9.791417122
5/15/2018 5:00	10.74858761
5/15/2018 5:15	9.490414619
5/15/2018 5:30	9.312150955
5/15/2018 5:45	7.414061069
5/15/2018 6:00	7.072896957
5/15/2018 6:15	6.572890282
5/15/2018 6:30	6.572890282
5/15/2018 6:45	6.816577435
5/15/2018 7:00	7.162519932
5/15/2018 7:15	8.357588768
5/15/2018 7:30	9.042705536
5/15/2018 7:45	8.530632973
5/15/2018 8:00	8.533905983
5/15/2018 8:15	7.669774532
5/15/2018 8:30	7.314041615
5/15/2018 8:45	7.314041615
5/15/2018 9:00	7.314041615
5/15/2018 9:15	9.059000969
5/15/2018 9:30	12.19747734
5/15/2018 9:45	15.02384472
5/15/2018 10:00	14.13167095
5/15/2018 10:15	14.13167095
5/15/2018 10:30	13.50331211
5/15/2018 10:45	9.320490837
5/15/2018 11:00	8.526807785
5/15/2018 11:15	7.686629772
5/15/2018 11:30	6.369562626
5/15/2018 11:45	6.804013252
5/15/2018 12:00	6.369562626
5/15/2018 12:15	10.6708107
5/15/2018 12:30	10.6708107
5/15/2018 12:45	10.6708107
5/15/2018 13:00	0
5/15/2018 13:15	0

Site 18 – MH 19.05 Flow Meter Data

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5/15/2018 20:00	0
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5/15/2018 20:30	7.799185276
5/15/2018 20:45	7.016937733
5/15/2018 21:00	10.47346592
5/15/2018 21:15	10.47346592
5/15/2018 21:30	9.498930931
5/15/2018 21:45	0
5/15/2018 22:00	0
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5/15/2018 22:45	6.842006207
5/15/2018 23:00	8.967670441
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5/16/2018 1:00	0
5/16/2018 1:15	0
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5/16/2018 4:15	0
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5/16/2018 6:45	0
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5/16/2018 9:45	0
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5/16/2018 10:15	0
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5/16/2018 11:00	7.567826271
5/16/2018 11:15	9.114181519
5/16/2018 11:30	9.124838829
5/16/2018 11:45	9.124838829
5/16/2018 12:00	8.476530075
5/16/2018 12:15	7.040953636
5/16/2018 12:30	8.497152328
5/16/2018 12:45	8.497152328
5/16/2018 13:00	8.776591301
5/16/2018 13:15	8.776591301

Site 18 – MH 19.05 Flow Meter Data

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5/16/2018 14:45	0
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5/16/2018 19:30	0
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5/16/2018 20:00	0
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5/16/2018 21:15	6.913546085
5/16/2018 21:30	7.871629715
5/16/2018 21:45	7.778750896
5/16/2018 22:00	7.778750896
5/16/2018 22:15	8.816000938
5/16/2018 22:30	8.428182602
5/16/2018 22:45	8.523129463
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5/16/2018 23:45	10.02268982
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5/17/2018 1:45	6.973016262
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5/17/2018 2:15	7.04103899
5/17/2018 2:30	7.04103899
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5/17/2018 4:15	6.976690292
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5/17/2018 5:00	0
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5/17/2018 5:45	7.616733074
5/17/2018 6:00	8.419877052
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5/17/2018 7:00	10.54801464
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5/17/2018 9:15	13.39321232
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5/17/2018 10:45	12.86916447
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5/17/2018 11:15	10.18395996
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5/17/2018 12:15	0
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5/17/2018 14:15	0
5/17/2018 14:30	0
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5/17/2018 15:45	0
5/17/2018 16:00	0
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5/17/2018 17:15	10.01354694
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5/17/2018 17:45	8.091106415
5/17/2018 18:00	8.091106415
5/17/2018 18:15	8.817523956
5/17/2018 18:30	8.817523956
5/17/2018 18:45	9.029115677
5/17/2018 19:00	9.174595833
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5/17/2018 19:30	9.318959236
5/17/2018 19:45	9.44305706
5/17/2018 20:00	9.641935349
5/17/2018 20:15	9.221246719
5/17/2018 20:30	9.092960358
5/17/2018 20:45	8.950915337
5/17/2018 21:00	9.456162453
5/17/2018 21:15	8.145275116
5/17/2018 21:30	8.511230469
5/17/2018 21:45	9.950342178
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5/17/2018 22:15	8.177803993
5/17/2018 22:30	8.224882126
5/17/2018 22:45	8.149596214
5/17/2018 23:00	7.939115047
5/17/2018 23:15	7.655551434
5/17/2018 23:30	7.43927145
5/17/2018 23:45	7.43927145
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5/18/2018 0:15	9.540251732
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5/18/2018 0:45	9.58251667
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5/18/2018 1:30	7.244287491
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5/18/2018 3:15	7.22668314
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5/18/2018 10:45	382.4099426
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5/18/2018 12:15	0
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5/18/2018 15:30	293.2008667
5/18/2018 15:45	13.76304626
5/18/2018 16:00	12.51513863
5/18/2018 16:15	6.974491596
5/18/2018 16:30	11.77038288
5/18/2018 16:45	11.72920799
5/18/2018 17:00	11.85200977
5/18/2018 17:15	11.6389761
5/18/2018 17:30	11.6389761
5/18/2018 17:45	9.156661987
5/18/2018 18:00	8.179581642
5/18/2018 18:15	8.179581642
5/18/2018 18:30	8.179581642
5/18/2018 18:45	8.488611221
5/18/2018 19:00	8.905684471
5/18/2018 19:15	10.65088177
5/18/2018 19:30	10.65088177
5/18/2018 19:45	10.65088177
5/18/2018 20:00	11.02485275
5/18/2018 20:15	10.65088177
5/18/2018 20:30	11.26677608
5/18/2018 20:45	10.05423069
5/18/2018 21:00	8.342952728
5/18/2018 21:15	8.169569016
5/18/2018 21:30	8.017991066
5/18/2018 21:45	7.459146023
5/18/2018 22:00	7.459146023
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5/18/2018 22:45	7.825870514
5/18/2018 23:00	7.561149597
5/18/2018 23:15	6.815315723
5/18/2018 23:30	6.438408852
5/18/2018 23:45	6.438408852
5/19/2018 0:00	6.203572273
5/19/2018 0:15	7.448018074
5/19/2018 0:30	7.327250957
5/19/2018 0:45	7.327250957
5/19/2018 1:00	7.729963779
5/19/2018 1:15	7.800351143
5/19/2018 1:30	6.442836761
5/19/2018 1:45	6.23854208
5/19/2018 2:00	6.52312088
5/19/2018 2:15	6.23854208
5/19/2018 2:30	7.301386833
5/19/2018 2:45	7.035865784
5/19/2018 3:00	7.301386833
5/19/2018 3:15	5.996297359
5/19/2018 3:30	5.860794067
5/19/2018 3:45	5.982914925
5/19/2018 4:00	5.805848598
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5/19/2018 4:30	6.410029411
5/19/2018 4:45	6.246804237
5/19/2018 5:00	5.87934494
5/19/2018 5:15	6.246804237
5/19/2018 5:30	6.469343185
5/19/2018 5:45	6.800071239
5/19/2018 6:00	8.251379967
5/19/2018 6:15	8.251379967
5/19/2018 6:30	9.421757698
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5/19/2018 7:15	8.474173546
5/19/2018 7:30	9.989664078
5/19/2018 7:45	9.604622841
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5/19/2018 8:15	10.50147629
5/19/2018 8:30	10.14411449
5/19/2018 8:45	10.15269661
5/19/2018 9:00	10.76792717
5/19/2018 9:15	11.25590801
5/19/2018 9:30	10.87287331
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5/19/2018 10:45	8.011813164
5/19/2018 11:00	8.134142876
5/19/2018 11:15	9.207910538
5/19/2018 11:30	9.207910538
5/19/2018 11:45	9.207910538
5/19/2018 12:00	8.905694008
5/19/2018 12:15	9.169116974
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5/19/2018 12:45	9.037546158
5/19/2018 13:00	9.472647667
5/19/2018 13:15	11.48992634

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5/19/2018 13:45	12.23081017	5/20/2018 1:45	0
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5/19/2018 14:15	7.56068182	5/20/2018 2:15	0
5/19/2018 14:30	6.89336729	5/20/2018 2:30	0
5/19/2018 14:45	6.89336729	5/20/2018 2:45	0
5/19/2018 15:00	6.89336729	5/20/2018 3:00	0
5/19/2018 15:15	7.045257568	5/20/2018 3:15	0
5/19/2018 15:30	7.275529861	5/20/2018 3:30	0
5/19/2018 15:45	7.565383911	5/20/2018 3:45	0
5/19/2018 16:00	7.565383911	5/20/2018 4:00	0
5/19/2018 16:15	8.028168678	5/20/2018 4:15	0
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5/19/2018 16:45	9.107607841	5/20/2018 4:45	0
5/19/2018 17:00	10.10285091	5/20/2018 5:00	0
5/19/2018 17:15	9.77332592	5/20/2018 5:15	0
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5/19/2018 18:00	10.38368607	5/20/2018 6:00	0
5/19/2018 18:15	9.77332592	5/20/2018 6:15	0
5/19/2018 18:30	9.690711975	5/20/2018 6:30	0
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5/19/2018 19:00	7.413928032	5/20/2018 7:00	0
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5/19/2018 19:45	9.121323586	5/20/2018 7:45	0
5/19/2018 20:00	8.576833725	5/20/2018 8:00	0
5/19/2018 20:15	0	5/20/2018 8:15	0
5/19/2018 20:30	0	5/20/2018 8:30	0
5/19/2018 20:45	3.699478865	5/20/2018 8:45	0
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5/19/2018 21:15	6.304368019	5/20/2018 9:15	0
5/19/2018 21:30	8.732059479	5/20/2018 9:30	0
5/19/2018 21:45	8.317706108	5/20/2018 9:45	0
5/19/2018 22:00	7.041818619	5/20/2018 10:00	0
5/19/2018 22:15	7.789911747	5/20/2018 10:15	0
5/19/2018 22:30	7.191570282	5/20/2018 10:30	0
5/19/2018 22:45	6.263498306	5/20/2018 10:45	0
5/19/2018 23:00	6.263498306	5/20/2018 11:00	0
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5/20/2018 1:15	0	5/20/2018 13:15	0

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5/20/2018 13:30	9.301059723
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5/21/2018 4:00	0
5/21/2018 4:15	0
5/21/2018 4:30	0
5/21/2018 4:45	0
5/21/2018 5:00	0
5/21/2018 5:15	0
5/21/2018 5:30	0
5/21/2018 5:45	0
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5/21/2018 6:15	0
5/21/2018 6:30	0
5/21/2018 6:45	0
5/21/2018 7:00	0
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5/21/2018 8:15	0
5/21/2018 8:30	0
5/21/2018 8:45	0
5/21/2018 9:00	0
5/21/2018 9:15	0
5/21/2018 9:30	0
5/21/2018 9:45	11.36908531
5/21/2018 10:00	20.5915966
5/21/2018 10:15	17.00647163
5/21/2018 10:30	21.53236198
5/21/2018 10:45	22.92982864
5/21/2018 11:00	21.58751106
5/21/2018 11:15	21.58751106
5/21/2018 11:30	20.45503426
5/21/2018 11:45	15.65044403
5/21/2018 12:00	15.35663033
5/21/2018 12:15	14.91804504
5/21/2018 12:30	14.34259224
5/21/2018 12:45	0
5/21/2018 13:00	0
5/21/2018 13:15	0

Site 18 – MH 19.05 Flow Meter Data

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5/21/2018 14:15	0
5/21/2018 14:30	0
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5/21/2018 21:15	0
5/21/2018 21:30	0
5/21/2018 21:45	9.67199707
5/21/2018 22:00	15.37685108
5/21/2018 22:15	13.83283615
5/21/2018 22:30	16.63241768
5/21/2018 22:45	16.08957481
5/21/2018 23:00	15.42391777
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5/21/2018 23:30	0
5/21/2018 23:45	0
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5/22/2018 0:30	19.4249115
5/22/2018 0:45	14.75517941
5/22/2018 1:00	19.58415604
5/22/2018 1:15	20.86068916
5/22/2018 1:30	20.86068916
5/22/2018 1:45	0
5/22/2018 2:00	0
5/22/2018 2:15	0
5/22/2018 2:30	0
5/22/2018 2:45	0
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5/22/2018 3:30	14.58295631
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5/22/2018 6:00	0
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5/22/2018 11:45	0
5/22/2018 12:00	0
5/22/2018 12:15	0
5/22/2018 12:30	0
5/22/2018 12:45	0
5/22/2018 13:00	0
5/22/2018 13:15	0

Site 18 – MH 19.05 Flow Meter Data

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5/22/2018 14:15	0
5/22/2018 14:30	0
5/22/2018 14:45	0
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5/22/2018 15:15	0
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5/22/2018 17:15	0
5/22/2018 17:30	0
5/22/2018 17:45	0
5/22/2018 18:00	0
5/22/2018 18:15	0
5/22/2018 18:30	0
5/22/2018 18:45	3.77180028
5/22/2018 19:00	5.455733776
5/22/2018 19:15	5.067193985
5/22/2018 19:30	7.152135849
5/22/2018 19:45	7.570301533
5/22/2018 20:00	7.570301533
5/22/2018 20:15	0
5/22/2018 20:30	0
5/22/2018 20:45	4.212007523
5/22/2018 21:00	8.807237625
5/22/2018 21:15	6.996429443
5/22/2018 21:30	8.293291092
5/22/2018 21:45	8.293291092
5/22/2018 22:00	8.293291092
5/22/2018 22:15	0
5/22/2018 22:30	0
5/22/2018 22:45	0
5/22/2018 23:00	0
5/22/2018 23:15	0
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5/23/2018 1:15	17.22885132
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5/23/2018 11:45	0
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5/23/2018 12:15	0
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5/23/2018 13:15	229.4592743

Site 18 – MH 19.05 Flow Meter Data

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5/23/2018 13:45	242.9469147
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5/23/2018 14:15	248.356369
5/23/2018 14:30	0
5/23/2018 14:45	0
5/23/2018 15:00	0
5/23/2018 15:15	0
5/23/2018 15:30	0
5/23/2018 15:45	3.613343239
5/23/2018 16:00	5.892408371
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5/23/2018 16:30	6.778479099
5/23/2018 16:45	11.18042088
5/23/2018 17:00	11.63015079
5/23/2018 17:15	11.83250713
5/23/2018 17:30	11.30334568
5/23/2018 17:45	10.30429173
5/23/2018 18:00	10.03122139
5/23/2018 18:15	9.503574371
5/23/2018 18:30	11.121171
5/23/2018 18:45	10.49521255
5/23/2018 19:00	9.548060417
5/23/2018 19:15	10.49521255
5/23/2018 19:30	8.906291962
5/23/2018 19:45	8.906291962
5/23/2018 20:00	8.033511162
5/23/2018 20:15	8.741127014
5/23/2018 20:30	7.81931591
5/23/2018 20:45	7.548473835
5/23/2018 21:00	8.599627495
5/23/2018 21:15	7.424045086
5/23/2018 21:30	7.424045086
5/23/2018 21:45	11.48723221
5/23/2018 22:00	12.40342808
5/23/2018 22:15	13.729949
5/23/2018 22:30	13.729949
5/23/2018 22:45	13.40002823
5/23/2018 23:00	13.40002823
5/23/2018 23:15	13.40002823
5/23/2018 23:30	14.93648243
5/23/2018 23:45	14.39107323
5/24/2018 0:00	14.39107323
5/24/2018 0:15	14.27936363
5/24/2018 0:30	13.49359322
5/24/2018 0:45	12.55296516
5/24/2018 1:00	11.51931858
5/24/2018 1:15	12.09301662
5/24/2018 1:30	12.44564819
5/24/2018 1:45	11.85522079
5/24/2018 2:00	10.43280506
5/24/2018 2:15	11.46572399
5/24/2018 2:30	11.27223778
5/24/2018 2:45	11.35676289
5/24/2018 3:00	11.6913681
5/24/2018 3:15	13.09601402
5/24/2018 3:30	11.25962257
5/24/2018 3:45	11.48723793
5/24/2018 4:00	0
5/24/2018 4:15	3.525062084
5/24/2018 4:30	5.235531807
5/24/2018 4:45	6.477542877
5/24/2018 5:00	7.691588879
5/24/2018 5:15	10.2462616
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5/24/2018 6:30	0
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5/24/2018 7:15	0
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5/24/2018 9:30	0
5/24/2018 9:45	0
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5/24/2018 10:15	0
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5/24/2018 10:45	0
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5/24/2018 11:15	15.42756176
5/24/2018 11:30	9.287129402
5/24/2018 11:45	8.396986008
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5/24/2018 12:15	8.4403162
5/24/2018 12:30	8.245092392
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5/24/2018 13:00	7.501401424
5/24/2018 13:15	7.501401424

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5/24/2018 13:45	9.262713432
5/24/2018 14:00	9.262713432
5/24/2018 14:15	8.959497452
5/24/2018 14:30	8.810272217
5/24/2018 14:45	9.182653427
5/24/2018 15:00	9.800020218
5/24/2018 15:15	9.611604691
5/24/2018 15:30	12.41817093
5/24/2018 15:45	12.53946304
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5/24/2018 16:15	11.49978447
5/24/2018 16:30	11.49978447
5/24/2018 16:45	9.563968658
5/24/2018 17:00	9.044065475
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5/24/2018 18:45	8.263759613
5/24/2018 19:00	7.903462887
5/24/2018 19:15	7.994562626
5/24/2018 19:30	9.105352402
5/24/2018 19:45	9.112522125
5/24/2018 20:00	9.713041306
5/24/2018 20:15	10.05387783
5/24/2018 20:30	9.868167877
5/24/2018 20:45	9.868167877
5/24/2018 21:00	9.846664429
5/24/2018 21:15	9.941350937
5/24/2018 21:30	9.92856884
5/24/2018 21:45	9.387611389
5/24/2018 22:00	8.203827858
5/24/2018 22:15	8.203827858
5/24/2018 22:30	8.203827858
5/24/2018 22:45	7.483466625
5/24/2018 23:00	7.576825142
5/24/2018 23:15	9.610265732
5/24/2018 23:30	8.118739128
5/24/2018 23:45	8.118739128
5/25/2018 0:00	8.400896072
5/25/2018 0:15	9.046867371
5/25/2018 0:30	9.046867371
5/25/2018 0:45	9.412792206
5/25/2018 1:00	9.30390358
5/25/2018 1:15	9.709980965
5/25/2018 1:30	9.959339142
5/25/2018 1:45	9.285330772
5/25/2018 2:00	9.303166389
5/25/2018 2:15	10.09164906
5/25/2018 2:30	10.20176506
5/25/2018 2:45	10.37664032
5/25/2018 3:00	11.39259624
5/25/2018 3:15	8.457964897
5/25/2018 3:30	8.973947525
5/25/2018 3:45	8.973947525
5/25/2018 4:00	9.146911621
5/25/2018 4:15	0
5/25/2018 4:30	0
5/25/2018 4:45	0
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5/25/2018 5:15	0
5/25/2018 5:30	45.74800491
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5/25/2018 6:00	60.7793808
5/25/2018 6:15	92.30178833
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5/25/2018 8:00	0
5/25/2018 8:15	8.244367599
5/25/2018 8:30	16.4887352
5/25/2018 8:45	7.290647984
5/25/2018 9:00	9.528307915
5/25/2018 9:15	9.490498543
5/25/2018 9:30	8.450872421
5/25/2018 9:45	9.694666862
5/25/2018 10:00	9.250557899
5/25/2018 10:15	9.551327705
5/25/2018 10:30	9.551327705
5/25/2018 10:45	9.551327705
5/25/2018 11:00	7.882012844
5/25/2018 11:15	13.60650158
5/25/2018 11:30	12.68665218
5/25/2018 11:45	12.22329903
5/25/2018 12:00	10.25515938
5/25/2018 12:15	9.62570858
5/25/2018 12:30	7.191349506
5/25/2018 12:45	7.993332863
5/25/2018 13:00	9.792723656
5/25/2018 13:15	9.639252663

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5/25/2018 13:45	13.49533558
5/25/2018 14:00	13.62183285
5/25/2018 14:15	11.05537319
5/25/2018 14:30	11.48780441
5/25/2018 14:45	11.48780441
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5/25/2018 15:15	10.29420567
5/25/2018 15:30	10.29420567
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5/25/2018 16:30	10.11709213
5/25/2018 16:45	9.595251083
5/25/2018 17:00	8.890339851
5/25/2018 17:15	8.890339851
5/25/2018 17:30	8.792512894
5/25/2018 17:45	8.598126411
5/25/2018 18:00	8.598126411
5/25/2018 18:15	10.41285229
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5/25/2018 19:45	8.612823486
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5/25/2018 20:45	9.363016129
5/25/2018 21:00	9.076799393
5/25/2018 21:15	8.070518494
5/25/2018 21:30	8.070518494
5/25/2018 21:45	7.97410059
5/25/2018 22:00	8.021333694
5/25/2018 22:15	6.693101406
5/25/2018 22:30	7.353979588
5/25/2018 22:45	7.063122749
5/25/2018 23:00	7.734823227
5/25/2018 23:15	7.63283968
5/25/2018 23:30	7.776782036
5/25/2018 23:45	7.63283968
5/26/2018 0:00	8.43610096
5/26/2018 0:15	8.538105011
5/26/2018 0:30	7.513931751
5/26/2018 0:45	7.424163818
5/26/2018 1:00	6.8920784
5/26/2018 1:15	5.97035265
5/26/2018 1:30	5.814701557
5/26/2018 1:45	5.661349773
5/26/2018 2:00	5.661349773
5/26/2018 2:15	5.594163418
5/26/2018 2:30	6.142202854
5/26/2018 2:45	7.167081833
5/26/2018 3:00	7.3665061
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5/26/2018 3:30	9.852906227
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5/26/2018 4:15	7.600260735
5/26/2018 4:30	7.690515518
5/26/2018 4:45	7.624031067
5/26/2018 5:00	8.041700363
5/26/2018 5:15	7.583484173
5/26/2018 5:30	7.782674313
5/26/2018 5:45	8.389090538
5/26/2018 6:00	8.417057991
5/26/2018 6:15	8.519719124
5/26/2018 6:30	9.656264305
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5/26/2018 7:15	10.44016075
5/26/2018 7:30	13.27420807
5/26/2018 7:45	14.99486065
5/26/2018 8:00	16.59744263
5/26/2018 8:15	17.83242989
5/26/2018 8:30	16.59744263
5/26/2018 8:45	11.35144806
5/26/2018 9:00	11.35144806
5/26/2018 9:15	10.21026421
5/26/2018 9:30	10.21026421
5/26/2018 9:45	8.464753151
5/26/2018 10:00	8.464753151
5/26/2018 10:15	8.958550453
5/26/2018 10:30	8.587781906
5/26/2018 10:45	8.567790985
5/26/2018 11:00	9.342683792
5/26/2018 11:15	10.78043747
5/26/2018 11:30	15.24382591
5/26/2018 11:45	16.972826
5/26/2018 12:00	20.77007103
5/26/2018 12:15	0
5/26/2018 12:30	8.622014046
5/26/2018 12:45	9.843662262
5/26/2018 13:00	5.849713326
5/26/2018 13:15	7.538115978

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5/26/2018 13:45	7.237756252
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5/26/2018 14:15	17.33114815
5/26/2018 14:30	15.96695995
5/26/2018 14:45	17.68534851
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5/26/2018 15:15	0
5/26/2018 15:30	0
5/26/2018 15:45	0
5/26/2018 16:00	0
5/26/2018 16:15	0
5/26/2018 16:30	0
5/26/2018 16:45	0
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5/26/2018 19:15	0
5/26/2018 19:30	0
5/26/2018 19:45	0
5/26/2018 20:00	0
5/26/2018 20:15	0
5/26/2018 20:30	10.28784275
5/26/2018 20:45	17.6792202
5/26/2018 21:00	9.030592918
5/26/2018 21:15	6.904605865
5/26/2018 21:30	8.610668182
5/26/2018 21:45	8.501041412
5/26/2018 22:00	7.38858366
5/26/2018 22:15	8.610668182
5/26/2018 22:30	8.83112812
5/26/2018 22:45	9.336281776
5/26/2018 23:00	8.653896332
5/26/2018 23:15	9.336281776
5/26/2018 23:30	9.336281776
5/26/2018 23:45	8.881849289
5/27/2018 0:00	8.775530815
5/27/2018 0:15	8.775530815
5/27/2018 0:30	6.074483871
5/27/2018 0:45	5.973795891
5/27/2018 1:00	5.973795891
5/27/2018 1:15	6.131034374
5/27/2018 1:30	6.120431423
5/27/2018 1:45	6.131034374
5/27/2018 2:00	6.245337963
5/27/2018 2:15	7.444239616
5/27/2018 2:30	7.877880096
5/27/2018 2:45	8.065828323
5/27/2018 3:00	11.64708042
5/27/2018 3:15	12.19120026
5/27/2018 3:30	13.1305542
5/27/2018 3:45	0
5/27/2018 4:00	0
5/27/2018 4:15	0
5/27/2018 4:30	0
5/27/2018 4:45	0
5/27/2018 5:00	0
5/27/2018 5:15	0
5/27/2018 5:30	0
5/27/2018 5:45	0
5/27/2018 6:00	0
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5/27/2018 6:30	0
5/27/2018 6:45	0
5/27/2018 7:00	0
5/27/2018 7:15	0
5/27/2018 7:30	0
5/27/2018 7:45	0
5/27/2018 8:00	0
5/27/2018 8:15	0
5/27/2018 8:30	9.247970581
5/27/2018 8:45	10.25629711
5/27/2018 9:00	7.213827133
5/27/2018 9:15	7.693572521
5/27/2018 9:30	7.693572521
5/27/2018 9:45	6.490259647
5/27/2018 10:00	8.071391106
5/27/2018 10:15	9.370193481
5/27/2018 10:30	9.370193481
5/27/2018 10:45	9.706414223
5/27/2018 11:00	9.050632477
5/27/2018 11:15	8.815897942
5/27/2018 11:30	10.18621826
5/27/2018 11:45	8.303987503
5/27/2018 12:00	8.202652931
5/27/2018 12:15	8.303987503
5/27/2018 12:30	7.168938637
5/27/2018 12:45	7.168938637
5/27/2018 13:00	9.407755852
5/27/2018 13:15	9.407755852

Site 18 – MH 19.05 Flow Meter Data

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5/27/2018 13:45	13.65679073
5/27/2018 14:00	10.84156036
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5/27/2018 14:30	17.54955482
5/27/2018 14:45	10.4290514
5/27/2018 15:00	10.4290514
5/27/2018 15:15	8.91505909
5/27/2018 15:30	8.336652756
5/27/2018 15:45	8.618560791
5/27/2018 16:00	8.618560791
5/27/2018 16:15	8.334606171
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5/27/2018 16:45	9.521526337
5/27/2018 17:00	9.521526337
5/27/2018 17:15	11.16538429
5/27/2018 17:30	11.4107132
5/27/2018 17:45	11.58231831
5/27/2018 18:00	11.54717159
5/27/2018 18:15	11.41033554
5/27/2018 18:30	9.155707359
5/27/2018 18:45	9.155707359
5/27/2018 19:00	9.155707359
5/27/2018 19:15	10.80769825
5/27/2018 19:30	9.175037384
5/27/2018 19:45	8.545873642
5/27/2018 20:00	9.049766541
5/27/2018 20:15	9.049766541
5/27/2018 20:30	7.984909058
5/27/2018 20:45	9.571208
5/27/2018 21:00	9.571208
5/27/2018 21:15	8.648592949
5/27/2018 21:30	9.347040176
5/27/2018 21:45	9.438254356
5/27/2018 22:00	9.214170456
5/27/2018 22:15	9.102711678
5/27/2018 22:30	9.201691628
5/27/2018 22:45	9.540883064
5/27/2018 23:00	10.26803684
5/27/2018 23:15	11.35685349
5/27/2018 23:30	9.269483566
5/27/2018 23:45	8.277950287
5/28/2018 0:00	7.895932674
5/28/2018 0:15	7.219135284
5/28/2018 0:30	7.332704544
5/28/2018 0:45	7.425733566
5/28/2018 1:00	7.296635628
5/28/2018 1:15	7.352751255
5/28/2018 1:30	7.360673904
5/28/2018 1:45	7.259789467
5/28/2018 2:00	7.259789467
5/28/2018 2:15	0
5/28/2018 2:30	0
5/28/2018 2:45	0
5/28/2018 3:00	0
5/28/2018 3:15	0
5/28/2018 3:30	0
5/28/2018 3:45	0
5/28/2018 4:00	0
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5/28/2018 5:15	0
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5/28/2018 6:00	0
5/28/2018 6:15	0
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5/28/2018 6:45	18.70204735
5/28/2018 7:00	13.12296772
5/28/2018 7:15	17.59063721
5/28/2018 7:30	17.59063721
5/28/2018 7:45	13.18937969
5/28/2018 8:00	8.70416832
5/28/2018 8:15	7.617444992
5/28/2018 8:30	7.617444992
5/28/2018 8:45	7.006482124
5/28/2018 9:00	8.052386284
5/28/2018 9:15	8.863857269
5/28/2018 9:30	8.863857269
5/28/2018 9:45	8.263190269
5/28/2018 10:00	7.435513496
5/28/2018 10:15	7.20388937
5/28/2018 10:30	7.20388937
5/28/2018 10:45	7.764828205
5/28/2018 11:00	7.457373619
5/28/2018 11:15	7.900789261
5/28/2018 11:30	8.374334335
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5/28/2018 12:15	10.33709908
5/28/2018 12:30	9.866545677
5/28/2018 12:45	7.538165092
5/28/2018 13:00	7.201654434
5/28/2018 13:15	6.920854092

Site 18 – MH 19.05 Flow Meter Data

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5/28/2018 13:45	10.75464821
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5/28/2018 14:15	9.537157059
5/28/2018 14:30	10.37480164
5/28/2018 14:45	9.469232559
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5/28/2018 15:45	14.41940784
5/28/2018 16:00	13.11514091
5/28/2018 16:15	13.11514091
5/28/2018 16:30	13.1073513
5/28/2018 16:45	11.00310326
5/28/2018 17:00	10.64700508
5/28/2018 17:15	9.668688774
5/28/2018 17:30	8.70873642
5/28/2018 17:45	7.487104416
5/28/2018 18:00	8.706915855
5/28/2018 18:15	0
5/28/2018 18:30	0
5/28/2018 18:45	0
5/28/2018 19:00	4.827690125
5/28/2018 19:15	8.114248276
5/28/2018 19:30	6.615066528
5/28/2018 19:45	8.141904831
5/28/2018 20:00	8.278434753
5/28/2018 20:15	8.162522316
5/28/2018 20:30	8.349603653
5/28/2018 20:45	8.443597794
5/28/2018 21:00	8.783083916
5/28/2018 21:15	9.761247635
5/28/2018 21:30	9.761247635
5/28/2018 21:45	9.95704937
5/28/2018 22:00	10.91562653
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5/28/2018 22:45	7.6134305
5/28/2018 23:00	10.56481743
5/28/2018 23:15	9.312480927
5/28/2018 23:30	9.495733261
5/28/2018 23:45	9.495733261
5/29/2018 0:00	8.165216446
5/29/2018 0:15	8.301335335
5/29/2018 0:30	8.046252251
5/29/2018 0:45	7.578901768
5/29/2018 1:00	8.424069405
5/29/2018 1:15	10.09846401
5/29/2018 1:30	9.921699524
5/29/2018 1:45	9.071795464
5/29/2018 2:00	10.09846401
5/29/2018 2:15	8.240683556
5/29/2018 2:30	7.11968565
5/29/2018 2:45	7.461172581
5/29/2018 3:00	7.151129246
5/29/2018 3:15	7.151129246
5/29/2018 3:30	7.536239624
5/29/2018 3:45	7.246866703
5/29/2018 4:00	7.345806599
5/29/2018 4:15	7.76483202
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5/29/2018 4:45	9.536411285
5/29/2018 5:00	9.536411285
5/29/2018 5:15	10.53739643
5/29/2018 5:30	10.84581661
5/29/2018 5:45	11.75009727
5/29/2018 6:00	11.69886684
5/29/2018 6:15	11.75009727
5/29/2018 6:30	11.07491493
5/29/2018 6:45	11.0035677
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5/29/2018 7:30	10.10095787
5/29/2018 7:45	10.38868809
5/29/2018 8:00	11.0382452
5/29/2018 8:15	11.04530621
5/29/2018 8:30	11.04530621
5/29/2018 8:45	11.04530621
5/29/2018 9:00	10.39605999
5/29/2018 9:15	8.476577759
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5/29/2018 11:30	8.955911636
5/29/2018 11:45	10.92075729
5/29/2018 12:00	10.55461693
5/29/2018 12:15	0
5/29/2018 12:30	0
5/29/2018 12:45	0
5/29/2018 13:00	0
5/29/2018 13:15	0

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5/29/2018 14:15	0
5/29/2018 14:30	0
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5/29/2018 16:15	0
5/29/2018 16:30	0
5/29/2018 16:45	0
5/29/2018 17:00	0
5/29/2018 17:15	0
5/29/2018 17:30	0
5/29/2018 17:45	0
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5/29/2018 18:15	21.36897278
5/29/2018 18:30	5.67233181
5/29/2018 18:45	7.531488895
5/29/2018 19:00	7.549552917
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5/29/2018 19:30	7.331901073
5/29/2018 19:45	7.331901073
5/29/2018 20:00	7.15414381
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5/29/2018 21:45	9.329993248
5/29/2018 22:00	9.918709755
5/29/2018 22:15	10.94214821
5/29/2018 22:30	12.49108887
5/29/2018 22:45	10.83619118
5/29/2018 23:00	10.11572933
5/29/2018 23:15	9.717438698
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5/29/2018 23:45	0
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5/30/2018 0:15	0
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5/30/2018 0:45	151.8729858
5/30/2018 1:00	100.1083069
5/30/2018 1:15	151.8729858
5/30/2018 1:30	151.8729858
5/30/2018 1:45	140.0393219
5/30/2018 2:00	96.14569855
5/30/2018 2:15	10.92606449
5/30/2018 2:30	7.271573544
5/30/2018 2:45	6.608012676
5/30/2018 3:00	6.689962387
5/30/2018 3:15	6.800940037
5/30/2018 3:30	6.800940037
5/30/2018 3:45	6.800940037
5/30/2018 4:00	6.273694038
5/30/2018 4:15	6.580476284
5/30/2018 4:30	6.719391823
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5/30/2018 5:15	20.69365883
5/30/2018 5:30	20.858778
5/30/2018 5:45	0
5/30/2018 6:00	3.177809238
5/30/2018 6:15	5.920607567
5/30/2018 6:30	4.562663078
5/30/2018 6:45	6.105084896
5/30/2018 7:00	6.105084896
5/30/2018 7:15	5.90333271
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5/30/2018 8:00	0
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5/30/2018 12:00	0
5/30/2018 12:15	0
5/30/2018 12:30	0
5/30/2018 12:45	0
5/30/2018 13:00	0
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Site 18 – MH 19.05 Flow Meter Data

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5/30/2018 14:15	0
5/30/2018 14:30	0
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5/30/2018 15:15	0
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5/30/2018 15:45	0
5/30/2018 16:00	0
5/30/2018 16:15	0
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5/30/2018 17:15	110.9270477
5/30/2018 17:30	110.9270477
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5/30/2018 19:00	7.525437355
5/30/2018 19:15	8.873768806
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5/30/2018 19:45	9.286975861
5/30/2018 20:00	9.286975861
5/30/2018 20:15	8.024035454
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5/30/2018 21:15	7.239338398
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5/30/2018 21:45	8.751786232
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5/30/2018 22:45	10.00852203
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5/30/2018 23:30	8.577181816
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5/31/2018 0:15	6.079877377
5/31/2018 0:30	6.117783546
5/31/2018 0:45	6.707794666
5/31/2018 1:00	6.87936306
5/31/2018 1:15	6.271465778
5/31/2018 1:30	6.266024113
5/31/2018 1:45	5.884224892
5/31/2018 2:00	5.884224892
5/31/2018 2:15	6.019823074
5/31/2018 2:30	7.537774086
5/31/2018 2:45	7.732343197
5/31/2018 3:00	6.750374794
5/31/2018 3:15	7.587140083
5/31/2018 3:30	7.587140083
5/31/2018 3:45	7.417592049
5/31/2018 4:00	7.715604782
5/31/2018 4:15	7.715604782
5/31/2018 4:30	6.515182972
5/31/2018 4:45	7.19334507
5/31/2018 5:00	9.301369667
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5/31/2018 7:45	6.400870323
5/31/2018 8:00	6.924812794
5/31/2018 8:15	8.619103432
5/31/2018 8:30	7.721154213
5/31/2018 8:45	7.52550602
5/31/2018 9:00	7.730149746
5/31/2018 9:15	7.730149746
5/31/2018 9:30	7.730149746
5/31/2018 9:45	8.373549461
5/31/2018 10:00	8.373549461
5/31/2018 10:15	9.575016975
5/31/2018 10:30	7.432667732
5/31/2018 10:45	7.432667732
5/31/2018 11:00	9.498809814
5/31/2018 11:15	9.949942589
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5/31/2018 11:45	7.716694355
5/31/2018 12:00	7.716694355
5/31/2018 12:15	7.755884647
5/31/2018 12:30	10.87024307
5/31/2018 12:45	11.22468281
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5/31/2018 13:15	9.064536095

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5/31/2018 14:30	8.953586578
5/31/2018 14:45	9.539399147
5/31/2018 15:00	9.952355385
5/31/2018 15:15	10.0593586
5/31/2018 15:30	9.808976173
5/31/2018 15:45	7.950526237
5/31/2018 16:00	8.021001816
5/31/2018 16:15	8.021001816
5/31/2018 16:30	8.021001816
5/31/2018 16:45	7.62205267
5/31/2018 17:00	7.694328785
5/31/2018 17:15	7.694328785
5/31/2018 17:30	7.162324905
5/31/2018 17:45	7.734893322
5/31/2018 18:00	0
5/31/2018 18:15	0
5/31/2018 18:30	0
5/31/2018 18:45	0
5/31/2018 19:00	0
5/31/2018 19:15	0
5/31/2018 19:30	0
5/31/2018 19:45	3.851329088
5/31/2018 20:00	7.702658176
5/31/2018 20:15	6.641109467
5/31/2018 20:30	9.658055305
5/31/2018 20:45	9.658055305
5/31/2018 21:00	8.944849968
5/31/2018 21:15	0
5/31/2018 21:30	5.883980274
5/31/2018 21:45	8.062758446
5/31/2018 22:00	7.424612045
5/31/2018 22:15	9.721938133
5/31/2018 22:30	10.00092602
5/31/2018 22:45	9.410475731
5/31/2018 23:00	9.410475731
5/31/2018 23:15	8.969504356
5/31/2018 23:30	9.113489151
5/31/2018 23:45	8.938933372
6/1/2018 0:00	9.119393349
6/1/2018 0:15	8.679772377
6/1/2018 0:30	0
6/1/2018 0:45	0
6/1/2018 1:00	0
6/1/2018 1:15	0
6/1/2018 1:30	0
6/1/2018 1:45	7.726395607
6/1/2018 2:00	15.45279121
6/1/2018 2:15	11.55618286
6/1/2018 2:30	15.45279121
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6/1/2018 3:30	87.19359589
6/1/2018 3:45	87.89305878
6/1/2018 4:00	88.48454285
6/1/2018 4:15	0
6/1/2018 4:30	0
6/1/2018 4:45	44.70719147
6/1/2018 5:00	7.421566486
6/1/2018 5:15	28.97297096
6/1/2018 5:30	9.197849274
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6/1/2018 6:00	10.44368076
6/1/2018 6:15	18.70747566
6/1/2018 6:30	21.34513664
6/1/2018 6:45	21.55137444
6/1/2018 7:00	22.74387932
6/1/2018 7:15	21.34513664
6/1/2018 7:30	20.63562202
6/1/2018 7:45	10.84965134
6/1/2018 8:00	8.761828423
6/1/2018 8:15	8.761828423
6/1/2018 8:30	7.599845409
6/1/2018 8:45	0
6/1/2018 9:00	0
6/1/2018 9:15	0
6/1/2018 9:30	0
6/1/2018 9:45	5.524421215
6/1/2018 10:00	7.88368845
6/1/2018 10:15	6.680883884
6/1/2018 10:30	7.144225597
6/1/2018 10:45	7.444509983
6/1/2018 11:00	7.144225597
6/1/2018 11:15	10.16719246
6/1/2018 11:30	10.14856625
6/1/2018 11:45	10.30646896
6/1/2018 12:00	10.30646896
6/1/2018 12:15	10.14856625
6/1/2018 12:30	8.664110184
6/1/2018 12:45	9.301136971
6/1/2018 13:00	8.045734406
6/1/2018 13:15	6.587440014

Site 18 – MH 19.05 Flow Meter Data

6/1/2018 13:30	8.277996063
6/1/2018 13:45	8.277996063
6/1/2018 14:00	10.98745632
6/1/2018 14:15	11.10907173
6/1/2018 14:30	11.10907173
6/1/2018 14:45	8.614677429
6/1/2018 15:00	8.298910141
6/1/2018 15:15	8.193428993
6/1/2018 15:30	6.668769836
6/1/2018 15:45	8.038836479
6/1/2018 16:00	9.440911293
6/1/2018 16:15	11.60857868
6/1/2018 16:30	11.26631069
6/1/2018 16:45	11.26631069
6/1/2018 17:00	9.061619759
6/1/2018 17:15	9.061619759
6/1/2018 17:30	9.061619759
6/1/2018 17:45	9.510989189
6/1/2018 18:00	11.20783424
6/1/2018 18:15	12.43118572
6/1/2018 18:30	13.40039921
6/1/2018 18:45	12.43118572
6/1/2018 19:00	11.73533821
6/1/2018 19:15	11.19737053
6/1/2018 19:30	11.43513489
6/1/2018 19:45	10.56694698
6/1/2018 20:00	10.89934921
6/1/2018 20:15	10.50747967
6/1/2018 20:30	10.50747967
6/1/2018 20:45	10.88150597
6/1/2018 21:00	11.91484833
6/1/2018 21:15	11.01294327
6/1/2018 21:30	12.81223297
6/1/2018 21:45	12.81223297
6/1/2018 22:00	10.05586433
6/1/2018 22:15	7.716012001
6/1/2018 22:30	7.997765541
6/1/2018 22:45	7.716012001
6/1/2018 23:00	6.708237171
6/1/2018 23:15	6.824770451
6/1/2018 23:30	6.642867088
6/1/2018 23:45	6.642867088
6/2/2018 0:00	5.362308502
6/2/2018 0:15	7.655847549
6/2/2018 0:30	7.210890293
6/2/2018 0:45	8.032717705
6/2/2018 1:00	7.210890293
6/2/2018 1:15	7.210890293
6/2/2018 1:30	7.874407291
6/2/2018 1:45	8.308167458
6/2/2018 2:00	5.051973343
6/2/2018 2:15	6.667996407
6/2/2018 2:30	7.943610191
6/2/2018 2:45	7.636091709
6/2/2018 3:00	7.605662823
6/2/2018 3:15	7.813427448
6/2/2018 3:30	7.709341526
6/2/2018 3:45	6.786965847
6/2/2018 4:00	6.949018478
6/2/2018 4:15	6.947266579
6/2/2018 4:30	7.038440704
6/2/2018 4:45	7.592576981
6/2/2018 5:00	8.245401382
6/2/2018 5:15	8.349726677
6/2/2018 5:30	8.06389904
6/2/2018 5:45	7.641132832
6/2/2018 6:00	8.624978065
6/2/2018 6:15	9.680300713
6/2/2018 6:30	10.56525707
6/2/2018 6:45	12.272439
6/2/2018 7:00	12.272439
6/2/2018 7:15	10.56525707
6/2/2018 7:30	9.777873039
6/2/2018 7:45	10.51133156
6/2/2018 8:00	8.671445847
6/2/2018 8:15	8.934551239
6/2/2018 8:30	8.934551239
6/2/2018 8:45	9.468672752
6/2/2018 9:00	8.914307594
6/2/2018 9:15	11.88056755
6/2/2018 9:30	11.9247942
6/2/2018 9:45	11.9247942
6/2/2018 10:00	13.49505424
6/2/2018 10:15	13.49505424
6/2/2018 10:30	9.937110901
6/2/2018 10:45	9.937110901
6/2/2018 11:00	12.28325653
6/2/2018 11:15	12.28325653
6/2/2018 11:30	14.30792236
6/2/2018 11:45	18.11819267
6/2/2018 12:00	14.30792236
6/2/2018 12:15	17.21773529
6/2/2018 12:30	13.11293507
6/2/2018 12:45	13.00671768
6/2/2018 13:00	10.88186741
6/2/2018 13:15	9.82304287

Site 18 – MH 19.05 Flow Meter Data

6/2/2018 13:30	8.188448906
6/2/2018 13:45	8.188448906
6/2/2018 14:00	8.188448906
6/2/2018 14:15	8.043026924
6/2/2018 14:30	8.500197411
6/2/2018 14:45	9.420070648
6/2/2018 15:00	9.118686676
6/2/2018 15:15	10.08834457
6/2/2018 15:30	11.10582829
6/2/2018 15:45	10.08834457
6/2/2018 16:00	9.163467407
6/2/2018 16:15	9.142684937
6/2/2018 16:30	8.54100132
6/2/2018 16:45	8.54100132
6/2/2018 17:00	9.446027756
6/2/2018 17:15	11.93309212
6/2/2018 17:30	12.29150295
6/2/2018 17:45	9.954240799
6/2/2018 18:00	9.447589874
6/2/2018 18:15	7.845458031
6/2/2018 18:30	6.770531654
6/2/2018 18:45	0
6/2/2018 19:00	0
6/2/2018 19:15	0
6/2/2018 19:30	3.816369534
6/2/2018 19:45	7.371474266
6/2/2018 20:00	5.750889778
6/2/2018 20:15	7.889508247
6/2/2018 20:30	8.000944138
6/2/2018 20:45	9.568286896
6/2/2018 21:00	9.568286896
6/2/2018 21:15	9.568286896
6/2/2018 21:30	9.457911491
6/2/2018 21:45	8.974554062
6/2/2018 22:00	8.834630013
6/2/2018 22:15	8.974554062
6/2/2018 22:30	7.769071102
6/2/2018 22:45	7.769071102
6/2/2018 23:00	7.984472275
6/2/2018 23:15	7.908228397
6/2/2018 23:30	7.984472275
6/2/2018 23:45	8.784943581
6/3/2018 0:00	8.652207375
6/3/2018 0:15	8.555005074
6/3/2018 0:30	8.102695465
6/3/2018 0:45	8.025643349
6/3/2018 1:00	8.025643349
6/3/2018 1:15	8.051644325
6/3/2018 1:30	7.615084648
6/3/2018 1:45	7.748876095
6/3/2018 2:00	7.748876095
6/3/2018 2:15	0
6/3/2018 2:30	0
6/3/2018 2:45	0
6/3/2018 3:00	0
6/3/2018 3:15	0
6/3/2018 3:30	0
6/3/2018 3:45	0
6/3/2018 4:00	0
6/3/2018 4:15	0
6/3/2018 4:30	0
6/3/2018 4:45	0
6/3/2018 5:00	4.550562382
6/3/2018 5:15	8.526780128
6/3/2018 5:30	6.538072586
6/3/2018 5:45	8.16060257
6/3/2018 6:00	8.370188713
6/3/2018 6:15	8.337778091
6/3/2018 6:30	8.417920113
6/3/2018 6:45	8.36560154
6/3/2018 7:00	9.030879974
6/3/2018 7:15	8.295787811
6/3/2018 7:30	8.258708
6/3/2018 7:45	8.258708
6/3/2018 8:00	7.991233826
6/3/2018 8:15	9.426437378
6/3/2018 8:30	9.426437378
6/3/2018 8:45	9.958456993
6/3/2018 9:00	11.06128311
6/3/2018 9:15	11.03275871
6/3/2018 9:30	11.05223846
6/3/2018 9:45	10.93844891
6/3/2018 10:00	10.93844891
6/3/2018 10:15	11.30708885
6/3/2018 10:30	9.707945824
6/3/2018 10:45	10.73853588
6/3/2018 11:00	14.29163933
6/3/2018 11:15	11.3223114
6/3/2018 11:30	13.23662663
6/3/2018 11:45	12.85439873
6/3/2018 12:00	12.68569279
6/3/2018 12:15	10.88128471
6/3/2018 12:30	11.90559959
6/3/2018 12:45	11.90559959
6/3/2018 13:00	11.90559959
6/3/2018 13:15	8.531282425

Site 18 – MH 19.05 Flow Meter Data

6/3/2018 13:30	8.531282425
6/3/2018 13:45	9.524232864
6/3/2018 14:00	7.761378288
6/3/2018 14:15	8.711236954
6/3/2018 14:30	12.05305576
6/3/2018 14:45	9.332975388
6/3/2018 15:00	7.864816666
6/3/2018 15:15	8.214657784
6/3/2018 15:30	10.26017761
6/3/2018 15:45	8.840366364
6/3/2018 16:00	10.98652935
6/3/2018 16:15	10.98652935
6/3/2018 16:30	8.764133453
6/3/2018 16:45	9.146981239
6/3/2018 17:00	9.439507484
6/3/2018 17:15	9.439507484
6/3/2018 17:30	10.7316885
6/3/2018 17:45	9.452899933
6/3/2018 18:00	9.272035599
6/3/2018 18:15	11.3611269
6/3/2018 18:30	9.452899933
6/3/2018 18:45	9.272740364
6/3/2018 19:00	11.04406452
6/3/2018 19:15	8.64380455
6/3/2018 19:30	8.337380409
6/3/2018 19:45	8.478421211
6/3/2018 20:00	8.478421211
6/3/2018 20:15	8.97623539
6/3/2018 20:30	8.549180984
6/3/2018 20:45	8.289110184
6/3/2018 21:00	7.386079788
6/3/2018 21:15	6.205753326
6/3/2018 21:30	6.492650986
6/3/2018 21:45	6.392827511
6/3/2018 22:00	6.421655655
6/3/2018 22:15	7.569502831
6/3/2018 22:30	7.074238777
6/3/2018 22:45	7.074238777
6/3/2018 23:00	7.074238777
6/3/2018 23:15	6.550233841
6/3/2018 23:30	6.550233841
6/3/2018 23:45	6.39548111
6/4/2018 0:00	6.479958534
6/4/2018 0:15	6.132032394
6/4/2018 0:30	6.851855278
6/4/2018 0:45	5.912642002
6/4/2018 1:00	6.851855278
6/4/2018 1:15	6.940087795
6/4/2018 1:30	6.921484947
6/4/2018 1:45	6.269039154
6/4/2018 2:00	6.87267828
6/4/2018 2:15	6.87267828
6/4/2018 2:30	6.87267828
6/4/2018 2:45	7.416167259
6/4/2018 3:00	9.742656708
6/4/2018 3:15	9.749270439
6/4/2018 3:30	0
6/4/2018 3:45	0
6/4/2018 4:00	0
6/4/2018 4:15	0
6/4/2018 4:30	0
6/4/2018 4:45	0
6/4/2018 5:00	0
6/4/2018 5:15	0
6/4/2018 5:30	4.956035137
6/4/2018 5:45	7.805957317
6/4/2018 6:00	7.165687084
6/4/2018 6:15	12.10812092
6/4/2018 6:30	10.10680485
6/4/2018 6:45	10.41699219
6/4/2018 7:00	10.5966301
6/4/2018 7:15	12.97614574
6/4/2018 7:30	176.0965729
6/4/2018 7:45	206.3167725
6/4/2018 8:00	216.697525
6/4/2018 8:15	216.697525
6/4/2018 8:30	0
6/4/2018 8:45	0
6/4/2018 9:00	0
6/4/2018 9:15	0
6/4/2018 9:30	0
6/4/2018 9:45	0
6/4/2018 10:00	22.61649895
6/4/2018 10:15	44.81718445
6/4/2018 10:30	37.15314484
6/4/2018 10:45	45.12185669
6/4/2018 11:00	60.70788956
6/4/2018 11:15	72.97950745
6/4/2018 11:30	0
6/4/2018 11:45	0
6/4/2018 12:00	0
6/4/2018 12:15	0
6/4/2018 12:30	0
6/4/2018 12:45	0
6/4/2018 13:00	0
6/4/2018 13:15	0

6/4/2018 13:30	0
6/4/2018 13:45	0
6/4/2018 14:00	0
6/4/2018 14:15	0
6/4/2018 14:30	0
6/4/2018 14:45	0
6/4/2018 15:00	0
6/4/2018 15:15	0
6/4/2018 15:30	0
6/4/2018 15:45	0
6/4/2018 16:00	0
6/4/2018 16:15	0
6/4/2018 16:30	0
6/4/2018 16:45	0
6/4/2018 17:00	0
6/4/2018 17:15	0
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6/4/2018 20:30	0
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6/4/2018 22:15	0
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6/4/2018 23:15	0
6/4/2018 23:30	0
6/4/2018 23:45	0
6/5/2018 0:00	0
6/5/2018 0:15	0
6/5/2018 0:30	0
6/5/2018 0:45	0
6/5/2018 1:00	0
6/5/2018 1:15	70.53648376
6/5/2018 1:30	141.0729675
6/5/2018 1:45	105.5601196
6/5/2018 2:00	138.8443451
6/5/2018 2:15	139.4011383
6/5/2018 2:30	139.4011383
6/5/2018 2:45	0
6/5/2018 3:00	0
6/5/2018 3:15	0
6/5/2018 3:30	0
6/5/2018 3:45	0
6/5/2018 4:00	0
6/5/2018 4:15	0
6/5/2018 4:30	0
6/5/2018 4:45	0
6/5/2018 5:00	0
6/5/2018 5:15	0
6/5/2018 5:30	0
6/5/2018 5:45	0
6/5/2018 6:00	0
6/5/2018 6:15	0
6/5/2018 6:30	0
6/5/2018 6:45	0
6/5/2018 7:00	0
6/5/2018 7:15	0
6/5/2018 7:30	17.69907379
6/5/2018 7:45	34.01791382
6/5/2018 8:00	22.78878593
6/5/2018 8:15	30.66612625
6/5/2018 8:30	25.80197525
6/5/2018 8:45	25.5019474

APPENDIX B

FIELD PHOTOGRAPHS

“CB” Smoke Testing Photos

June 22, 2018

CB4_Earleys_Lot 5

CB5_Earleys_Lot5b

CB6_Earleys_Lot7

CB7_Earleys_Lot7b

CB8_Muralt_vacant lot

CB9_NOLS_weak co patch

CB10_Muralt_private mh

CB11_Muralt_not visible

CB12_MuraltTrailer_openco (1)

CB13_MuraltLaundromat_openco

CB14_School_open drain (1)

CB14_School_open drain (2)

CB15_RV Dump

CB16_163_Open pipe end

CB_52 Pioneer Street - Vent and Open Pipe

CB_16641 HWY 112

CB_16712 HWY 112 - Vent

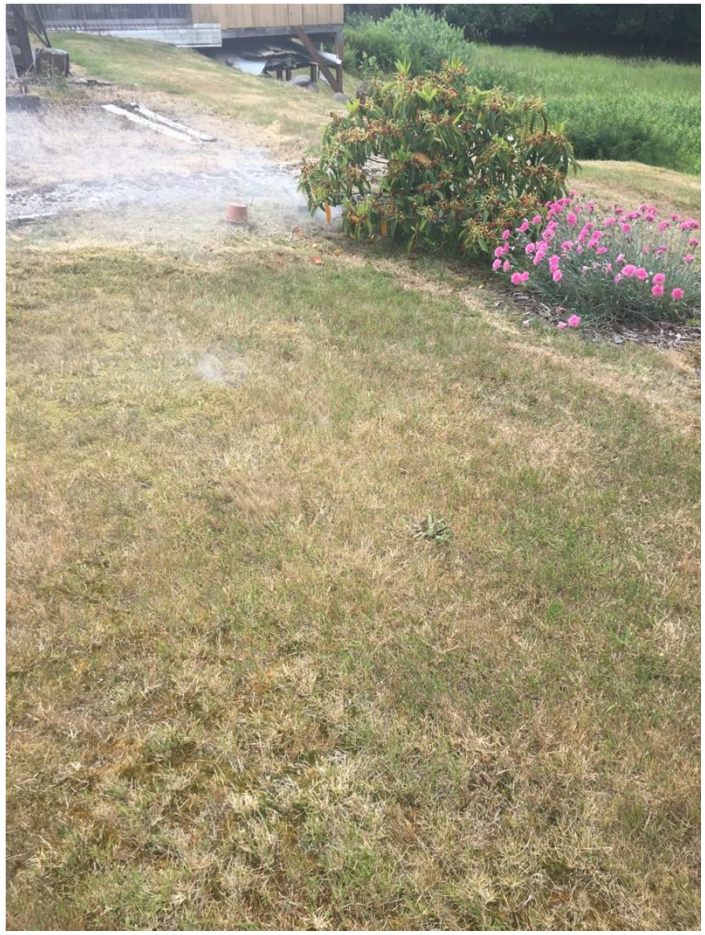
CB_16712 HWY 112 (from 52 Pioneer Street)

CB_16716 HWY 112 - Vent

CB_16732 HWY 112 - Clean Out (hidden, out back)

CB_No Address Listed (east of 16661 HWY 112)

CB_No Address Listed (East of 16716)



CBa_No Address Listed (east of 16661 HWY 112)

CBb_No Address Listed (east of 16661 HWY 112)

“AJ” Smoke Testing Photos

June 21-June 22, 2018

20180621_092448AJ1

20180621_092505AJ2

20180621_092508AJ3

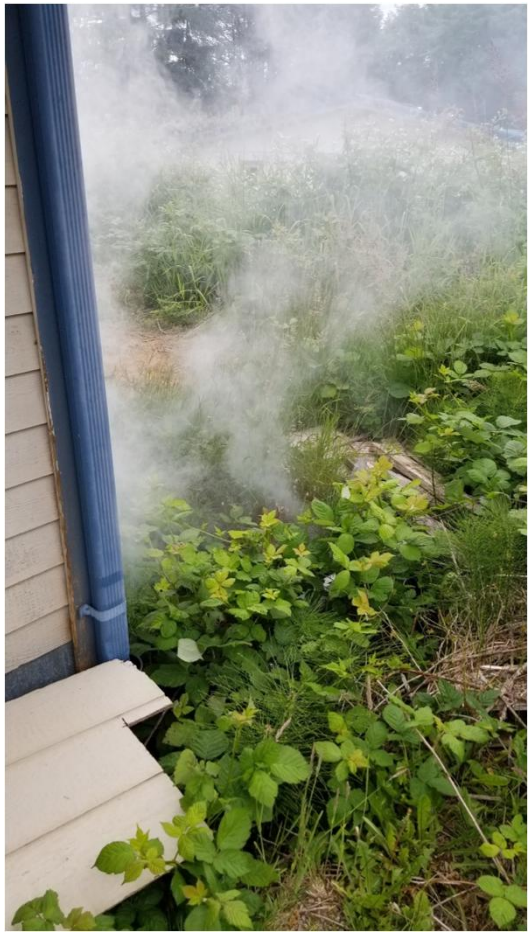
20180621_092513AJ4

20180621_092528AJ5

20180621_092717AJ6

20180621_092729AJ7

20180621_092753AJ8



20180621_092800AJ9

20180621_092808AJ10

20180621_092822AJ11

20180621_092829AJ12

20180621_093957AJ13

20180621_094018AJ14

20180621_094032AJ15

20180621_094259AJ16

20180621_094657AJ17

20180621_094701AJ18

20180621_095832AJ19

20180621_102027AJ20

20180621_102041AJ21

20180621_102401AJ22

20180621_105719AJ23

20180621_114417AJ24

20180621_114422AJ25

20180621_115526AJ26

20180621_115724AJ27

20180621_115730AJ28

20180621_120031AJ29

20180621_133944AJ30

20180621_133956AJ31

20180621_134026AJ32

20180621_134034AJ33

20180621_134145AJ34

20180621_134202AJ35

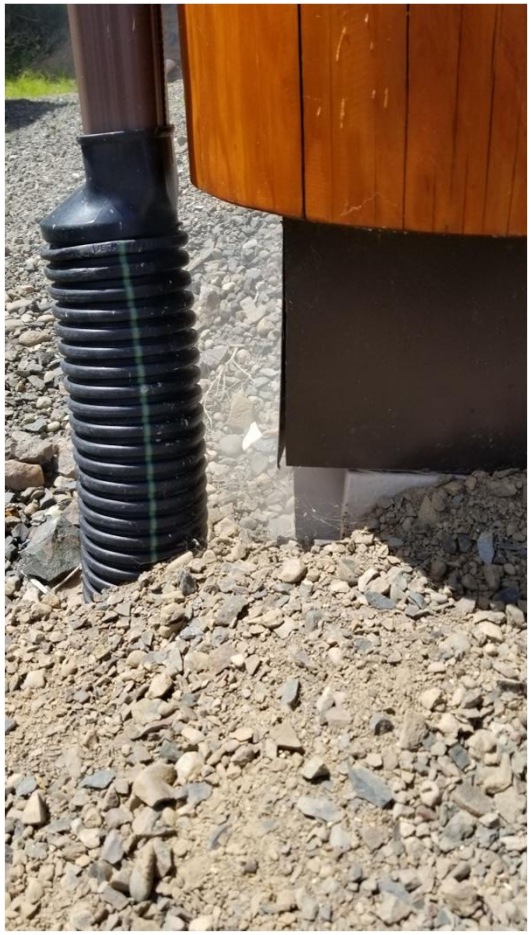
20180621_134216AJ36

20180621_134304AJ37

20180621_134730AJ38

20180621_134828(0)AJ40

20180621_134828AJ39



20180621_135012AJ41

20180621_152901AJ42

20180621_152904AJ43

20180621_155716AJ44

20180621_161021AJ45

20180621_161028AJ46

20180622_091540AJ47

20180622_093433AJ48

20180622_093527AJ49

20180622_094839AJ50

20180622_100737AJ51

20180622_103453AJ52

“SC” Smoke Testing Photos

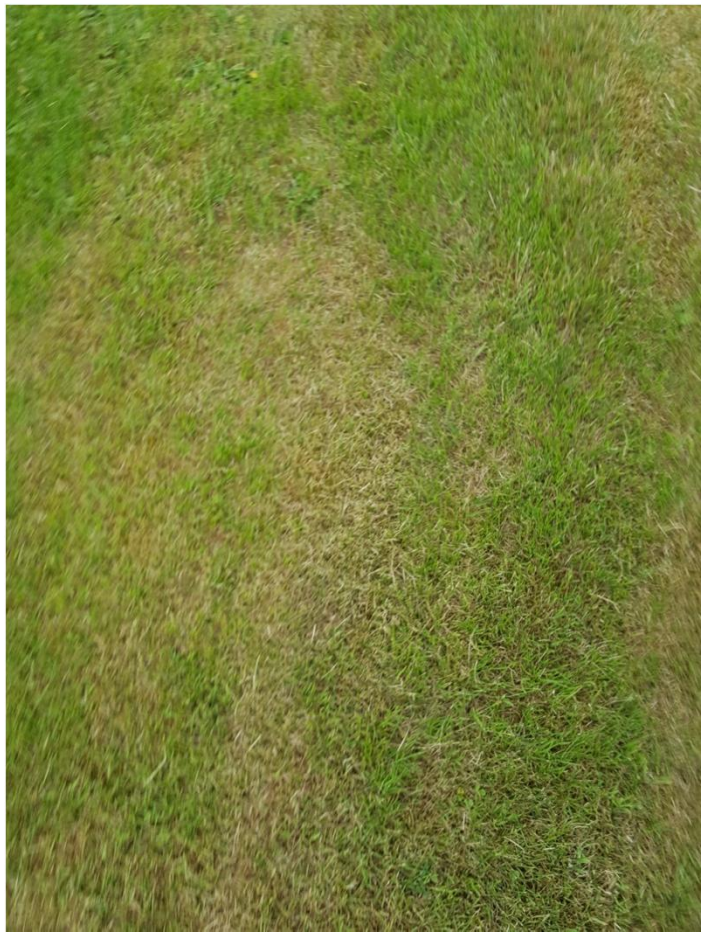
June 21 – June 22, 2018

20180621_092501_1sc

20180621_092523_2sc

20180621_092706_3sc

20180621_092848_4sc



20180621_093927_5sc

20180621_093933_6sc

20180621_094004_7sc

20180621_094109_8sc

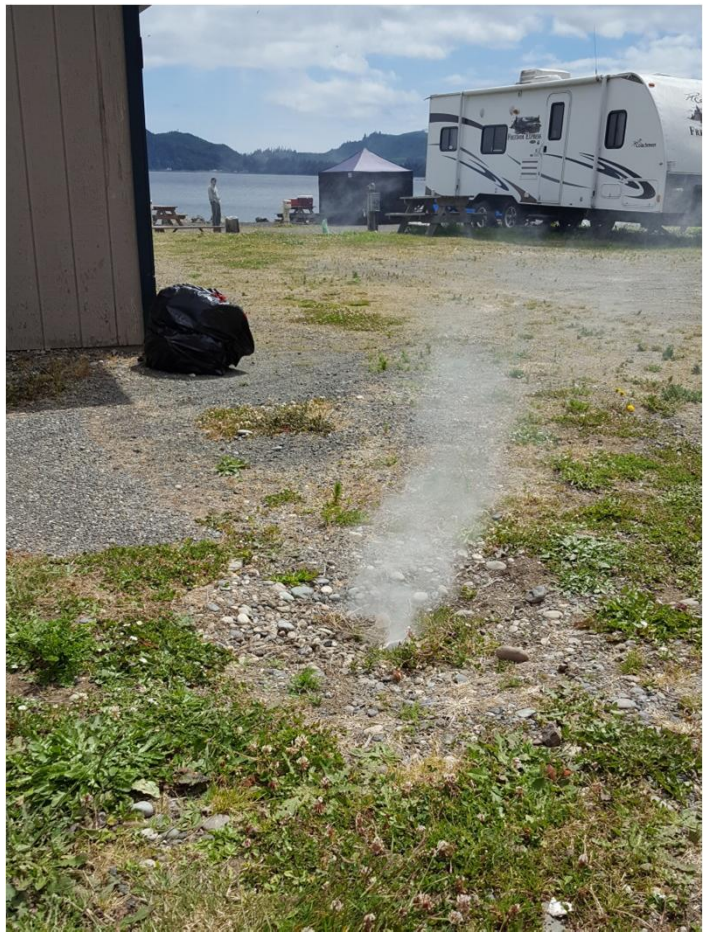
20180621_094135_9sc

20180621_102445_10sc

20180621_110121_11sc

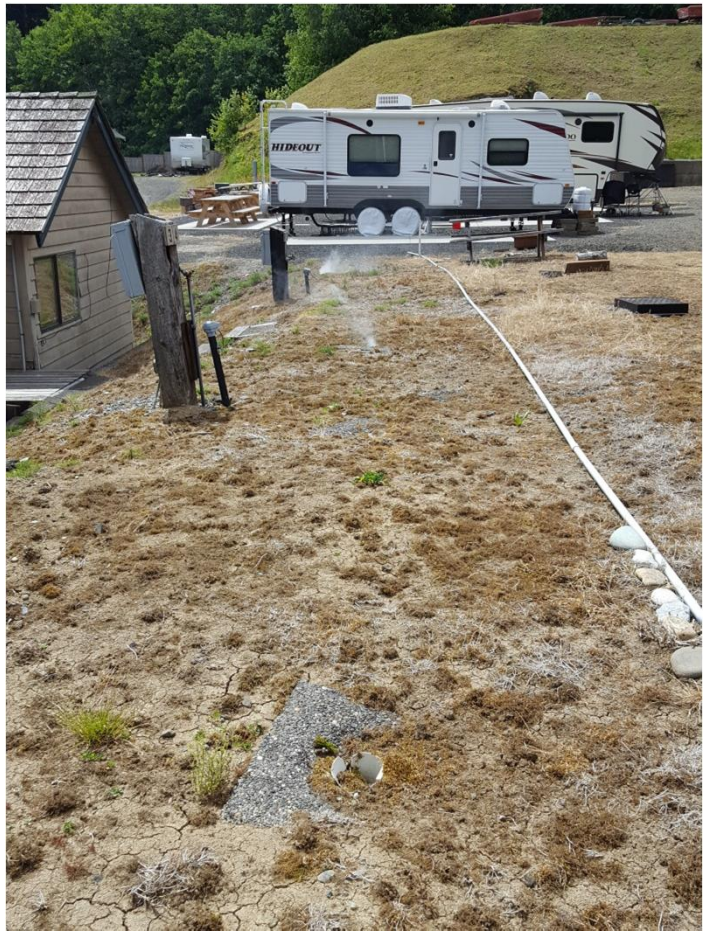
20180621_110353_12sc

20180621_110404_13sc



20180621_114443_14sc

20180621_114446_15sc



20180621_115523_16sc

20180621_120033_17sc

20180621_121509_18sc

20180621_121510_19sc

20180621_121514_20sc

20180621_134122_21sc

20180621_152603_22sc

20180621_153237_23sc

20180621_154022_24sc

20180621_155352_25sc

20180621_161631_26sc

20180621_162117_27sc

20180622_091759_1asc

20180622_093430_2asc

20180622_095040_3asc

20180622_102302_4asc

20180622_104043_5asc

20180622_111751_6asc

20180622_111920_7asc

20180622_113010_8asc

20180622_113012_9asc

“K” Smoke Testing Photos

June 21-June 22, 2018

IMG_3853K1

IMG_3854K2

IMG_3855K3

IMG_3856K4

IMG_3857K5

IMG_3858K6

IMG_3859K7

IMG_3860K8

IMG_3861K9

IMG_3862K10

IMG_3863K11

IMG_3864K12

IMG_3865K13

IMG_3866K14

IMG_3867K15

IMG_3868K16

IMG_3869K17

IMG_3870K18

IMG_3871K19

IMG_3872K20

IMG_3873K21

IMG_3874K22

IMG_3875K23

IMG_3876K24

IMG_3877K25

IMG_3878K26

IMG_3879K27

IMG_3880K28

IMG_3881K29

IMG_3882K30

IMG_3883K31

IMG_3884K32

“SK” Smoke Testing Photos

June 21, 2018

SK1_Angler's Hideaway RV Connections

SK1a_Angler's Hideaway RV Connections

SK1b_Angler's Hideaway RV Connections

SK2_Angler's Hideaway Public Building - Vent

SK2a_Anglers Hideaway Public Building - Vent

SK2b_Anglers Hideaway RV Connection

SK3_194 Airport Road - Vent

SK4_172 Funk & Ballard Alley Road - Vent

SK5_103 Funk & Ballaard Alley Road - Vent

SK6_Funk & Ballard Alley Road RV Connection

SK7_122 funk & Ballard Alley Road RV Connection

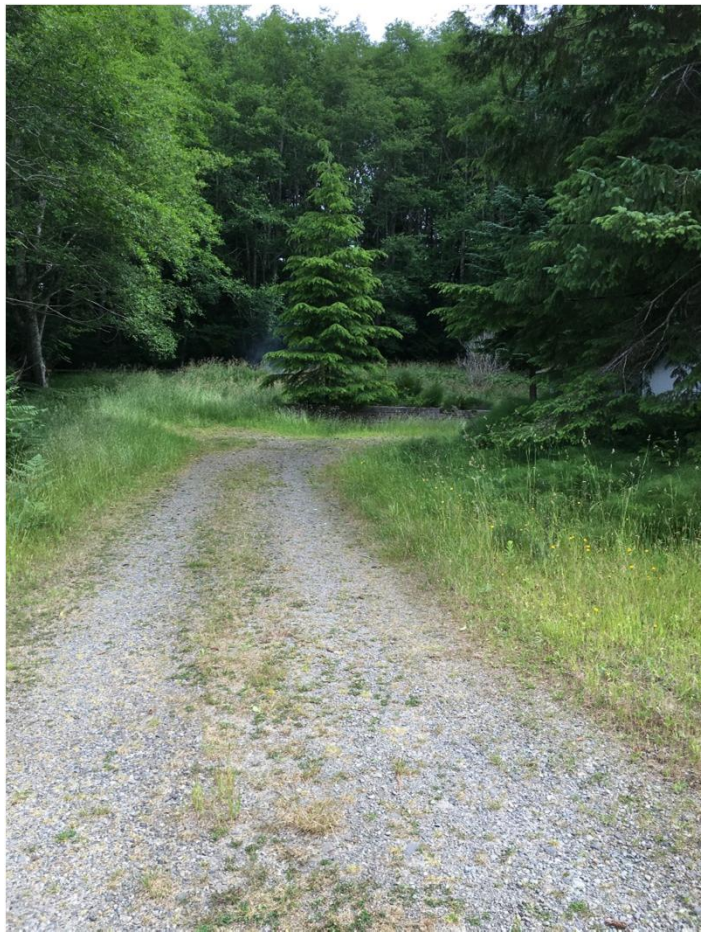
SK8_Funk & Ballard RV Connection

SK8a_ Funk & Ballard RV Connection

SK8b_Funk & Ballard RV Connection

SK9_RV Connection (see SK2b)

SK9a_RV Connection (see SK2b, SK8)



SK10_14183 HWY 112 - Open Pipe

SK11_MH 3.10

SK11a_MH 3.10

SK11b_MH 3.10

SK12_13843 HWY 112 - Vent

SK13_New Hope Food Bank - Vent

SK13a_Assembly of God Church - Clean Out and Vent

SK14_MH 3.03

SK15_13443 HWY 112 - Vent

SK16_No Address Listed - Vent and Clean Out

SK17_Deeded Manhole

SK17a_Deeded Manhole

SK18_Van Ripers Clean Out

SK19_Van Riper's Public Building - Vent

SK20_Solson's Resort - Vent

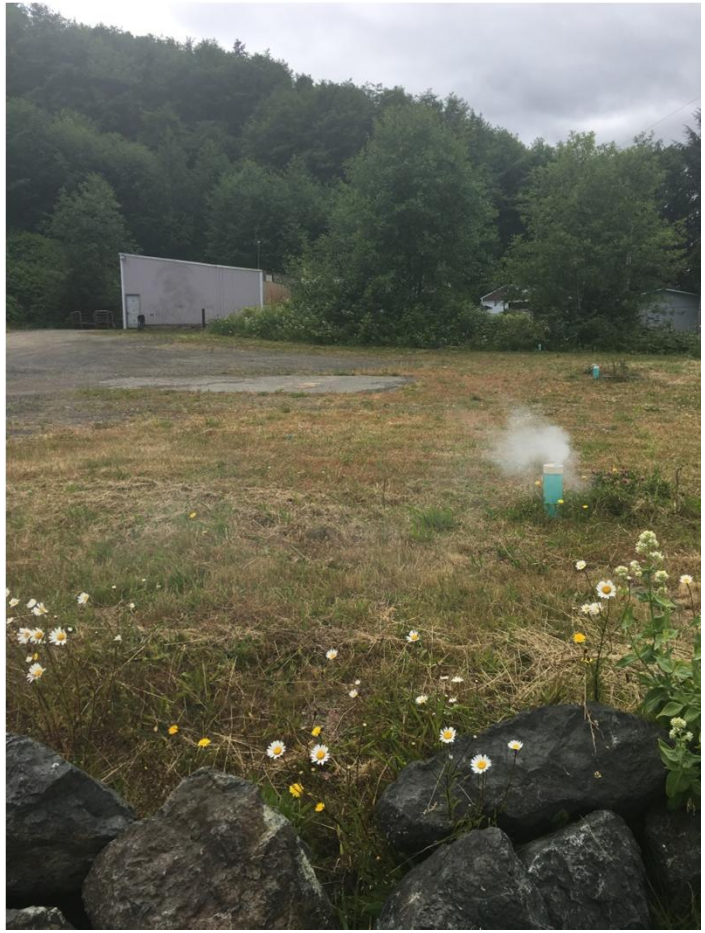
SK21_Curley's Resort - Vent

SK22_Van Riper;s RV Connection (west)

SK23_72 Front Street

SK24_Bay Motel

SK24a_Bay Motel



SK25_Coho Estates

APPENDIX C

SMOKE TEST FIELD MAPS AND FORMS

AJ

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 1

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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AJ

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Feet
0 50 100 200

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS — Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 2

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 4

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Feet
0 50 100 200

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- Sewer Subbasin
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU
GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 5

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- P S Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 6

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co16486 Clallam Bay Sekiu GSP\WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS — Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 7

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 8

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 10

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\16486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 11

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 12

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 13

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS — Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 1

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station (PS)
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 2

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 3

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 4

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 6

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 7

Gray & Osborne, Inc.
CONSULTING ENGINEERS

I:\Clallam\Co\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 8

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 9

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU
GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 10

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 11

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 12

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

5c

(orange) medium priority

Block two pipes at a time

(green) lower priority

Beige parcels had smoke during 2016 testing

CLALLAM RIVER

Frontier St

Pioneer St

Bogachiel St

Hwy 112

Hoh St

Sol Duc St

Raymond St

8th St

6th St

W Kellogg St

Eagle Crest Way

Weel Rd

MH-25.03
MH-25.02
MH-30.02
MH-25.01
MH-29.02
MH-30.01
MH-26.03
MH-26.02
MH-26.01B
MH-26.01A
MH-26.01
MH-26.06
MH-26.05
MH-26.04
MH-31.06
MH-31.05
MH-31.04
MH-31.03
MH-31.02
MH-31.01
MH-18.01
MH-18.02
MH-18.03
MH-19.01
MH-33.01
MH-32.01
MH-32.02
MH-32.03
MH-27.01
MH-28.01
MH-19.02
MH-18.04
MH-27.02
MH-22.06
MH-22.05
MH-22.04
MH-22.03
MH-22.02
MH-22.01
MH-19.03
MH-23.01
MH-18.05
MH-18.06
MH21-02
MH-21.01
MH-19.05
MH-19.04
MH-18.07
MH-21.03
MH-19.06
MH-19-09
MH-19-08
MH-19.07
MH-20.01
MH-24.01
MH-18.08
MH-24.02
MH-18.09
MH-18.12
MH-18.10
MH-18.11
MH-24.03

New Houses open ~~lands~~ Vacant on Finder.

0 375 750 1,500 Feet

LEGEND

- 2016 smoke
- Sewer Subbasin
- force_main
- <all other values>

Basin_Name

- Clallam Bay LS (East)
- Clallam Bay LS (West)
- Clallam Bay WWTP
- Highway 112
- Lighthouse LS
- Middle Point LS
- Sekiu Airport Rd
- Sekiu LS
- Snob Hill LS
- West End LS
- MANHOLE
- pipes
- ROAD
- RIVER
- Concrete
- PVC
- TMZ/TMP
- PS PUMP STATION
- SEWER TREATMENT PLANT
- UGA BOUNDARY
- PARCEL

N

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

~~FIGURE 2-7~~
~~LAND USE (SEKIU)~~

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP-GIS\Working map.mxd

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 1

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station (PS)
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 2

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS — Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 4

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- Sewer Subbasin
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 5

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
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- PS — Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 7

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 8

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\16486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station (PS)
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 9

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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N

East wall of the Clallam Bay INN

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- P S Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 10

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 11

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 12

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Cor18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 13

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co\18436 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
2016 RESULTS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam Co\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

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N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 1

Gray & Osborne, Inc.
CONSULTING ENGINEERS

I:\ClallamCty\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

SK

N

Feet
0 50 100 200

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 2

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP\WWFP\GIS\Smoke Test Maps.mxd

SK

N

Feet
0 50 100 200

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station (P.S)
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 3

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

SK

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 4

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

SK

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS — Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- Sewer Subbasin
- 2016 Smoke Parcels
- UGA BOUNDARY

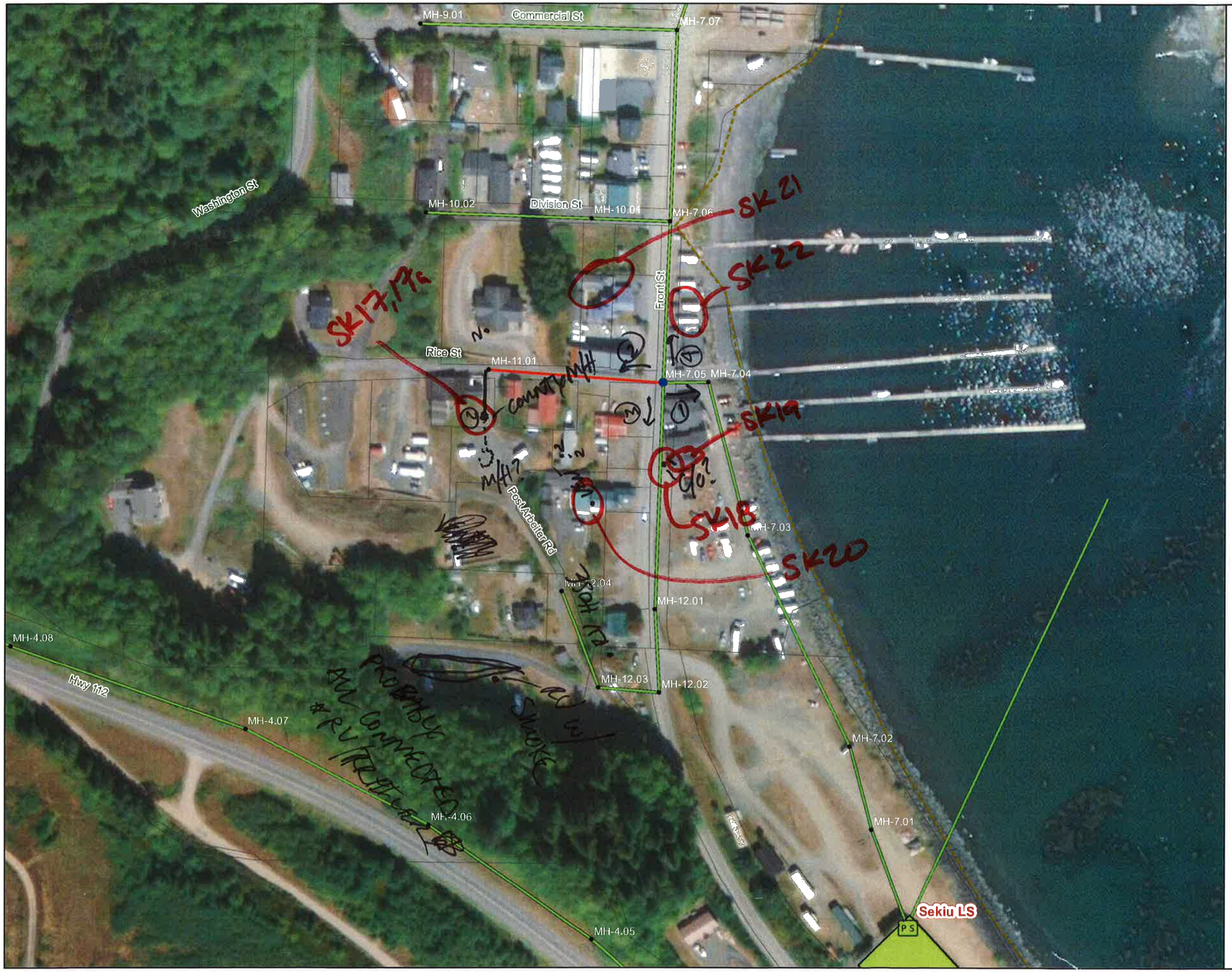
CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 5

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

SK



N

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 7

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

SK

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 6

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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SK

60 LOTS
JEFF KONOPASKI
360-808-1804

N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

NOTE THAT MH 13.06 WAS SMOKED & NO ACTIVITY W/ BAY/MOFAL VENTS

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 8

Gray & Osborne, Inc.
CONSULTING ENGINEERS

I:\ClallamCo 18486 Clallam Bay-Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

SK

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 9

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 10

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo 18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

MU

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 11

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\ClallamCo\18486 Clallam Bay Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

N

0 50 100 200 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 12

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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MU

N

Feet

0 100 200 400

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LEGEND

- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU
GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
2016 RESULTS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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MU

N

0 100 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Smoke Insertion Point
- Manhole
- Concrete
- PVC
- TMZ/TMP
- Force Main
- PS Pump station
- Sewer Treatment Plant
- RIVER
- PARCEL
- 2016 Smoke Parcels
- UGA BOUNDARY

CLALLAM BAY/SEKIU GENERAL SEWER/WASTEWATER FACILITIES PLAN

SMOKE TESTING
FIGURE 13

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Clallam\Co\18486 Clallam Bay, Sekiu GSP WWFP\GIS\Smoke Test Maps.mxd

1.1

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468
Date:
Time:
Observer: Adam John

Street Location:

Smoke Inserted at MH: 7.05
Smoke Direction: SE

Observed Smoke Return

Photo Numbers: (2) 24, 25

Smoke Location: SITE 44

Probable Cause/
Potential Remedy: (CONNECTION) Educate RV'ers

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County

Project: Clallam Bay/Sekiu GSP/WWFP

Job Number: 18468

Date:

Time:

Observer: Adam John

Street Location:

Smoke Inserted at MH: 7.05

Smoke Direction: E

Observed Smoke Return

Photo Numbers: (2) 26, 27

Smoke Location: exposed pipe next to bldg

Probable Cause/
Potential Remedy:

Sketch:

Notes:

SMOKE TEST RESULTS

Client:	Clallam County	Date:	6-21-2018
Project:	Clallam Bay/Sekiu GSP/WWFP	Time:	9:20
Job Number:	18468	Observer:	ADAM JOHN

Street Location: SEKIU AIRPORT

Smoke Inserted at MH: S.03 Smoke Direction: N

Observed Smoke Return

Photo Numbers: 1-5

Smoke Location: see map, open pipes above ground

Probable Cause/
Potential Remedy: CAP PIPES

Sketch:

Notes:

SMOKE TEST RESULTS

2

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date:
Time: 9:30
Observer: AJ

Street Location: AIRPORT

Smoke Inserted at MH: 5.03

Smoke Direction: N

Observed Smoke Return

Photo Numbers: 6 - 7

Smoke Location: open stub - out

Probable Cause/
Potential Remedy: cap pipe

Sketch:

Notes:

SMOKE TEST RESULTS

3

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date:
Time: 9:30
Observer: AJ

Street Location: AIRPORT

Smoke Inserted at MH: 5.03

Smoke Direction: N

Observed Smoke Return

Photo Numbers: 8 – 12

Smoke Location: exposed pipe / basement / roof

Probable Cause/
Potential Remedy: Broken pipe, open stub-out

Sketch:

Notes:

SMOKE TEST RESULTS

4

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date:
Time: 9:40
Observer: AJ

Street Location: FUNK & Ballards

Smoke Inserted at MH: 5.03

Smoke Direction: W

Observed Smoke Return

Photo Numbers: 13-~~14~~ 16, 19

Smoke Location: STUB OUT? underground at empty lot

Probable Cause/
Potential Remedy: open ended 4" pipe
cap pipe

Sketch:

Notes:

SMOKE TEST RESULTS

5

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date:
Time: 9:45
Observer: AJ

Street Location: F & B

Smoke Inserted at MH: 5.03
Smoke Direction: W

Observed Smoke Return

Photo Numbers: 17-18

Smoke Location: out of ground

Probable Cause/ stub-out ?
Potential Remedy: cap pipe ?

Sketch:

Notes:

SMOKE TEST RESULTS

6

Client:	Clallam County	Date:	6-21
Project:	Clallam Bay/Sekiu GSP/WWFP	Time:	10:15
Job Number:	18468	Observer:	AJ

Street Location: ~~1~~ Hwy 112

Smoke Inserted at MH: 3-11 Smoke Direction: E/W

Observed Smoke Return

Photo Numbers: 20 -21

Smoke Location: rear house, open pipe 4"

Probable Cause/ open pipe, maybe cracked

Potential Remedy: cap, replace ?

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date:
Time:
Observer:

Street Location: Hwy 112

Smoke Inserted at MH: 3-11

Smoke Direction: E/W

Observed Smoke Return

Photo Numbers: 22

Smoke Location: 3.10, on side of manhole at ditch

Probable Cause/
Potential Remedy: broken M.H. or pipe

Sketch:

Notes:

8

SMOKE TEST RESULTS

Client: Clallam County

Project: Clallam Bay/Sekiu GSP/WWFP

Job Number: 18468

Date: 6-21-2018

Time: 10:40

Observer: AJ

Street Location: Hwy 112

Smoke Inserted at MH: 3.04

Smoke Direction: ~~X~~ W

Observed Smoke Return

Photo Numbers: 22 23

Smoke Location: MH. 3.03

Probable Cause/
Potential Remedy: Broken M.H.

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-2018
Time: 11:20
Observer: AJ

Street Location: Hwy 112

Smoke Inserted at MH: 2.01

Smoke Direction: W

Observed Smoke Return

Photo Numbers: 23

Smoke Location:

Probable Cause/
Potential Remedy:

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Date: 6-21-18
Project: Clallam Bay/Sekiu GSP/WWFP
Time:
Job Number: 18468
Observer: SC

Street Location: Airport Rd

Smoke Inserted at MH: 5-03
Smoke Direction:

Observed Smoke Return

Photo Numbers: 5 - open cleanout
7-8 - leak thru ground → broken pipe? 4" PVC

Smoke Location: Funke Bellards → Cap Cleanouts
Old RV site Some pipes may be broken to (See Kim's notes)

Probable Cause/
Potential Remedy:

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-22-18
Time: 11:30
Observer: Matthew McDonald

Street Location: 163 Salt Air

Smoke Inserted at MH: MH ~~16.02~~ 15.04

Smoke Direction:

Observed Smoke Return

Photo Numbers: # 20

Smoke Location:

Probable Cause/
Potential Remedy: Open pipe hidden in the bush in front of the house. Smoke is also coming from behind the house

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-22-18
Time: 11:05
Observer: Mathew McDonald

Street Location: Salmon & Frontier

Smoke Inserted at MH: MH 14.01 ~~Lighthouse~~

Smoke Direction:

Observed Smoke Return

Photo Numbers: #19

Smoke Location: Sewer hook up

Probable Cause/
Potential Remedy: Hook up below grade and loose connection

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 9:45
Observer: Matthew McDonald

Street Location: Park Loop

Smoke Inserted at MH: 5.03

Smoke Direction:

Observed Smoke Return

Photo Numbers: #4 & #5

Smoke Location: Anglers Hideaway

Probable Cause/
Potential Remedy: Open pipe

Sketch:

Notes: Photos #4 & #5 are of the open pipe.

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 9:55
Observer: Matthew McDonald

Street Location: Anglers Hideaway

Smoke Inserted at MH: 6.02

Smoke Direction:

Observed Smoke Return

Photo Numbers: #6

Smoke Location:

Probable Cause/
Potential Remedy: Broken pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 10:00
Observer: Matthew McDonald

Street Location: Anglers Hideaway off of Amys Loop

Smoke Inserted at MH: 6.02

Smoke Direction:

Observed Smoke Return

Photo Numbers: #7

Smoke Location:

Probable Cause/
Potential Remedy: Open Pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 10:05
Observer: Matthew McDonald

Street Location: Address #123 Anglers Hideaway

Smoke Inserted at MH: # C.02

Smoke Direction:

Observed Smoke Return

Photo Numbers: #8

Smoke Location: Address #123 Anglers Hideaway

Probable Cause/
Potential Remedy: Broken Pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 10:20
Observer: Matthew McDonald

Street Location: Hwy 112 Address 14183

Smoke Inserted at MH: 3.11

Smoke Direction:

Observed Smoke Return

Photo Numbers: No photo

Smoke Location:

Probable Cause/
Potential Remedy: Open pipe

Sketch:

Notes: pipe is on a hill to the north of the building.

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468
Date: 6-21-18
Time: 10:30
Observer: Matthew McDonald

Street Location:

Smoke Inserted at MH: MH 311
Smoke Direction:

Observed Smoke Return

Photo Numbers: # 9

Smoke Location: MH 310

Probable Cause/
Potential Remedy: There is a hole in the concrete around manhole cover

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 11:00
Observer: Matthew McDonald

Street Location: Hwy 112 Address 13693

Smoke Inserted at MH: MH 3.04

Smoke Direction:

Observed Smoke Return

Photo Numbers: #10

Smoke Location: Black berry bushes in Front of ~~church~~

Probable Cause/
Potential Remedy: Burried in blackberry bushes. Probably open pipe.

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 11:05
Observer: Matthew McDonald

Street Location: Hwy 112

Smoke Inserted at MH: 3.03

Smoke Direction:

Observed Smoke Return

Photo Numbers: #11

Smoke Location: MH 3.03

Probable Cause/
Potential Remedy: There is a hole in the concrete near the manhole cover.

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468
Date: 6-21-18
Time: 11:25
Observer: Matthew McDonald

Street Location: Hwy. 112 Address 13413

Smoke Inserted at MH: MH 2.01
Smoke Direction:

Observed Smoke Return

Photo Numbers: #11

Smoke Location: east of house

Probable Cause/
Potential Remedy: open pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 11:25
Observer: Matthew McDonald

Street Location: Hwy 112 Address 13443

Smoke Inserted at MH: MH 2.01

Smoke Direction: _____

Observed Smoke Return

Photo Numbers: #12 Address 13443

Smoke Location: South side of shop

Probable Cause/
Potential Remedy: faulty sewer connection to travel trailer.

Sketch:

Notes: _____

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 11:55
Observer: Matthew McDonald

Street Location: 201 Front St

Smoke Inserted at MH: MH 7.05

Smoke Direction:

Observed Smoke Return

Photo Numbers: #13

Smoke Location: Under wood pile in the drive way

Probable Cause/
Potential Remedy: Open pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468
Date: 6-21-18
Time: 12:00
Observer: Matthew McDonald

Street Location: Front St.

Smoke Inserted at MH: MH 7.05
Smoke Direction:

Observed Smoke Return

Photo Numbers: #14

Smoke Location: Just off of SW corner of Van Ripers Main building.

Probable Cause/
Potential Remedy: Broken cap

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 12:25
Observer: Matthew McDonald

Street Location: Front St.

Smoke Inserted at MH: MH 7.05

Smoke Direction:

Observed Smoke Return

Photo Numbers: #15

Smoke Location: Sewer hook up on a site west of VanRipers in front of dock.

Probable Cause/
Potential Remedy: Faulty sewer connection

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468
Date: 6-21-18
Time:
Observer: Matthew McDonald

Street Location: Hwy 112 Address 15442

Smoke Inserted at MH: MH 7.08 13.05
Smoke Direction:

Observed Smoke Return

Photo Numbers: #16

Smoke Location:

Probable Cause/
Potential Remedy: Broken caps and pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 3:35
Observer: Matthew McDonald

Street Location: Coho estates

Smoke Inserted at MH: ~~13.06~~ private manhole

Smoke Direction:

Observed Smoke Return

Photo Numbers: No photo

Smoke Location: spot # 33 Coho estates

Probable Cause/
Potential Remedy: Broken sewer pipe
All sewer hook ups are below grade.

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-12
Time:
Observer: Mathew McDonald

Street Location: HWY 112

Smoke Inserted at MH: MH 31.02

Smoke Direction: 400

Observed Smoke Return

Photo Numbers: No photo

Smoke Location: East and South side of fish cannery.

Probable Cause/
Potential Remedy: floor drain and ~~open pipe~~ possible broken pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468
Date: 6-21-18
Time:
Observer: Matthew McDonald

Street Location: Hwy 112 ~~16641~~ Address 16641

Smoke Inserted at MH: MH 26.03
Smoke Direction:

Observed Smoke Return

Photo Numbers: #17

Smoke Location:

Probable Cause/
Potential Remedy: No cap Below grade.

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468
Date: 6-21-18
Time: 4:20
Observer: Matthew McDonald

Street Location: Hwy 112 Address 16593

Smoke Inserted at MH: MH 26.03
Smoke Direction:

Observed Smoke Return

Photo Numbers: No photo

Smoke Location: On the westside of the house

Probable Cause/
Potential Remedy: broken cap

Sketch:

Notes:

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-22-18
Time: 9:20
Observer: Matthew McDonald

Street Location: 6th St & 112 East of Address 135

Smoke Inserted at MH: MH 26.01

Smoke Direction: _____

Observed Smoke Return

Photo Numbers: #18 & #19

Smoke Location: _____

Probable Cause/
Potential Remedy: open pipes

Sketch:

Notes: _____

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-22-18
Time: 9:40
Observer: Matthew McDonald

Street Location: Earley's Trailer Park Address 519

Smoke Inserted at MH: MH 32.01

Smoke Direction: _____

Observed Smoke Return

Photo Numbers: No photo

Smoke Location: _____

Probable Cause/
Potential Remedy: broken caps & loose trailer connections

Sketch:

Notes: _____

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-22-18
Time: 9:50
Observer: Mathew McDonald

Street Location: 6th Street library

Smoke Inserted at MH: MH 22.20

Smoke Direction:

Observed Smoke Return

Photo Numbers: No photos

Smoke Location:

Probable Cause/
Potential Remedy: Open pipe

Sketch:

Notes:

SMOKE TEST RESULTS

Client:	Clallam County	Date:	6-22-12
Project:	Clallam Bay/Sekiu GSP/WWFP	Time:	10:40
Job Number:	18468	Observer:	Matthew McDonald

Street Location: Frontier East wall of the Clallam Bay INN

Smoke Inserted at MH: MH ~~16.06~~ 18.06 Smoke Direction: _____

Observed Smoke Return

Photo Numbers: No Photos

Smoke Location: _____

Probable Cause/ Broken pipe

Potential Remedy: _____

Sketch:

Notes: _____

SMOKE TEST RESULTS

Client: Clallam County
Project: Clallam Bay/Sekiu GSP/WWFP
Job Number: 18468

Date: 6-21-18
Time: 9:35
Observer: Mathew McDonald

Street Location: Airport Rd.

Smoke Inserted at MH: 5.03

Smoke Direction:

Observed Smoke Return

Photo Numbers: 1 & 2

Smoke Location: Anglers Hideaway RV Spot # 21, 23, 24, 25

Probable Cause/
Potential Remedy: The caps are not on tight on the sewer Hook-ups.

Sketch:

Notes: #1 & #2 photos are of spot #21, 23, 24, 25
#3

APPENDIX D

MANHOLE INSPECTIONS

Manhole Inspection Photos

May 10, 2018

1.01-20180510_100702

1.01-20180510_100823

1.01-20180510_100830

1.01-20180510_100836

2.01-20180510_094900

2.01-20180510_094909

2.01-20180510_094920

2.01-20180510_095128

2.01-20180510_095144

2.04-20180510_104652

2.04-20180510_104700

2.04-20180510_104706

2.04-20180510_104708

2.04-20180510_104712

4.03-IMG_1196

4.03-IMG_1197

4.04-IMG_1198

4.04-IMG_1199

4.04-IMG_1200

4.10-IMG_1201

4.10-IMG_1202

4.10-IMG_1203

4.10-IMG_1204

4.10-IMG_1205

5.02-20180510_105744

5.02-20180510_105752

5.02-20180510_105755

5.02-20180510_105802

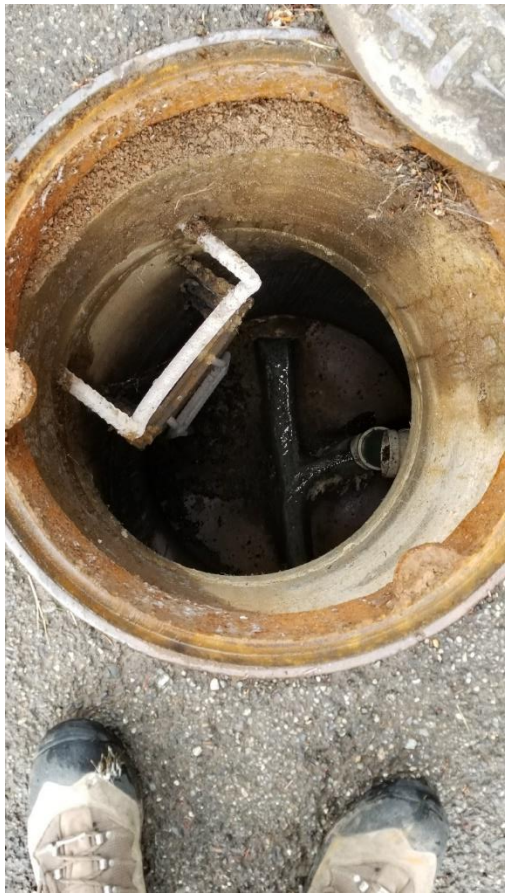
5.02-20180510_105806

5.02-20180510_105808

5.02-20180510_105811

6.01-20180510_110555

6.01-20180510_110557

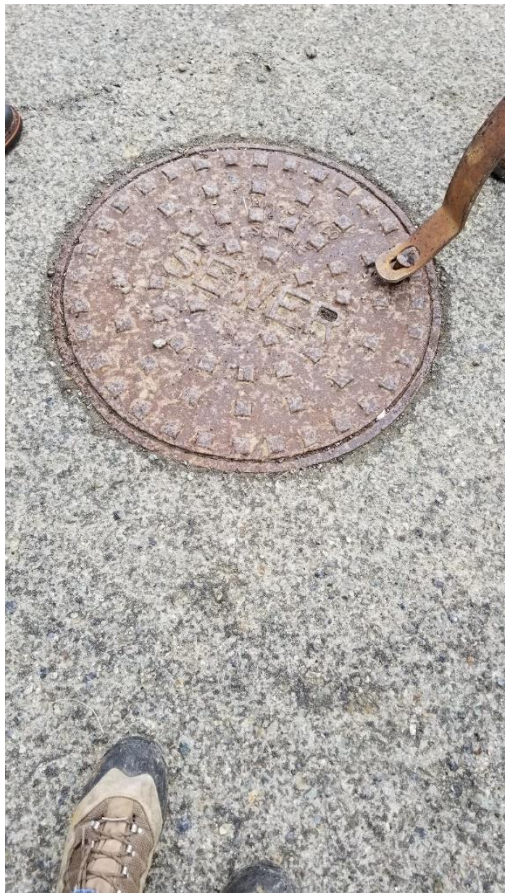


6.01-20180510_110604

6.01-20180510_110610

6.01-20180510_110702

6.01-20180510_110722



7.00-20180510_123416

7.00-20180510_123417

7.00-20180510_123425

7.00-20180510_123434

7.00-20180510_123444

7.06-20180510_114617

7.06-20180510_114625

7.06-20180510_114633

7.06-20180510_114639

7.07-20180510_115649

7.07-20180510_115659

7.07-20180510_115742

7.07-20180510_120321

7.07-20180510_120326

7.07-20180510_120435

7.07-20180510_121024

7.08-20180510_121957

7.08-20180510_121958

7.08-20180510_122008

7.08-20180510_122015

7.09-20180510_122559

7.09-20180510_122614

7.09-20180510_122619

13.05-20180510_113126

13.05-20180510_113235

13.05-20180510_113312

13.05-20180510_113313

13.05-20180510_113341

13.05-20180510_113346

13.05-20180510_113351

13.05-20180510_113406

13.05-20180510_113410

13.06-20180510_111809

13.06-20180510_111817

13.06-20180510_111819

13.06-20180510_111917

13.06-20180510_111936

13.06-20180510_111940

13.06-20180510_111959

14.01-20180510_151837

14.01-20180510_151901

14.01-20180510_151907

14.01-20180510_151913

14.01-20180510_151917

16.01-20180510_152715

16.01-20180510_152721

18.02-20180510_135039

18.02-20180510_135042

18.02-20180510_135054

18.02-20180510_135056

18.02-20180510_135102

18.05-20180510_140519

18.05-20180510_140542

18.05-20180510_140604

18.05-20180510_140607

18.05-20180510_140609

18.05-20180510_140611

18.05-20180510_140613

18.05-20180510_140616

18.06A-20180510_141212

18.06A-20180510_141229

18.06A-20180510_141232

18.06A-20180510_141236

18.06A-20180510_141301

18.06A-20180510_141302

18.08-20180510_141942

18.08-20180510_142033

18.08-20180510_142044

18.08-20180510_142059

19.05-20180510_143026

19.05-20180510_143040

19.05-20180510_143056

19.05-20180510_143100

19.05-20180510_143103

19.05-20180510_143108

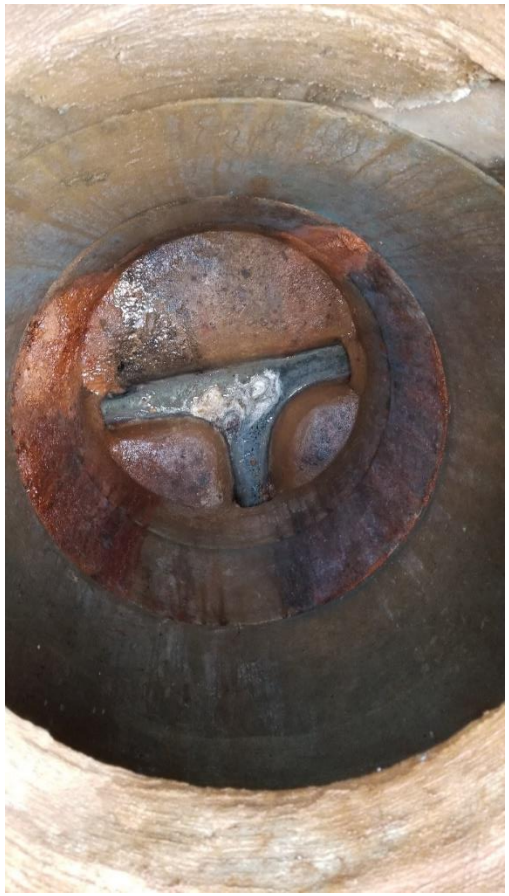
19.06-20180510_143802

19.06-20180510_143806

19.07-20180510_144249

19.07-20180510_144253

19.07-20180510_144258



19.07-20180510_144300

25.03-20180510_145246

25.03-20180510_145250

25.03-20180510_145252

25.03-20180510_145259

26.01-20180510_132123

26.01-20180510_132124

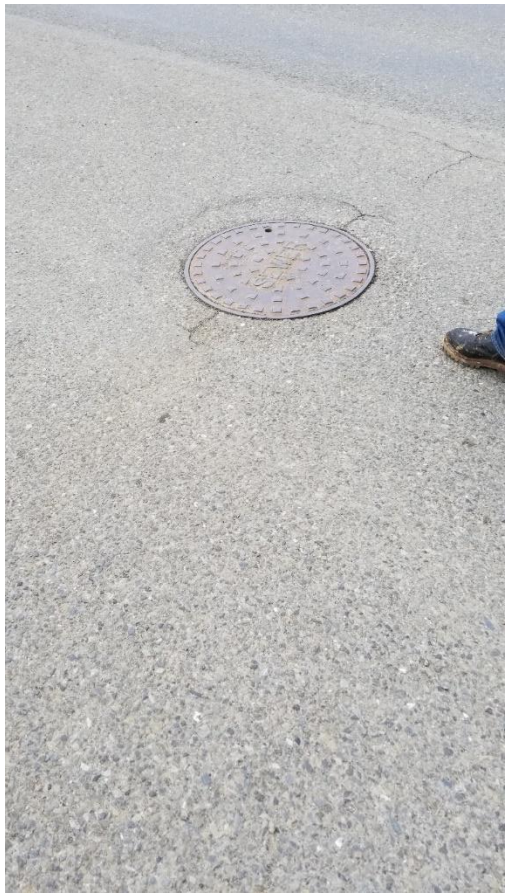
26.01-20180510_132207

26.01-20180510_132210

26.01-20180510_132214

26.01-20180510_132216

26.01-20180510_132220



26.02-20180510_132909

26.02-20180510_132917

26.02-20180510_132921

26.02-20180510_132928

26.02-20180510_132931

26.02-20180510_132933

26.02-20180510_132936

26.02-20180510_132942

26.03-20180510_133415

26.03-20180510_133420

26.03-20180510_133424

26.03-20180510_133435

26.03-20180510_133440

31.02-20180510_125624

31.02-20180510_125629

31.02-20180510_125637

31.02-20180510_130105

32.01-20180510_130412

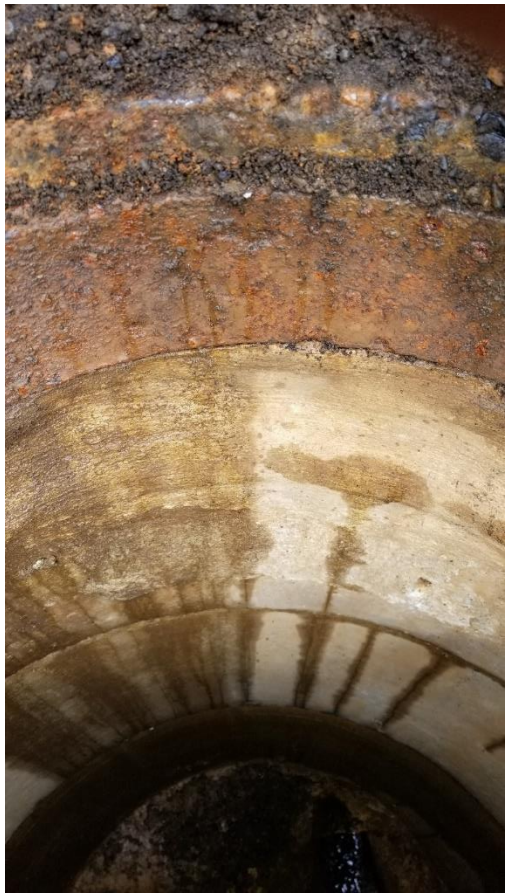
32.01-20180510_130413

32.01-20180510_130414

32.01-20180510_130911

32.01-20180510_130918

32.01-20180510_130922



32.01-20180510_130925

32.01-20180510_130926

32.01-20180510_130930

32.01-20180510_130933

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	5/10/18	Manhole ID:	1.21	City:	SEKIU
Date:	10:10 AM	Basin ID:		G&O Job:	# 16486
		Picture:	702 - 836	Crew:	DOTY / JOHN

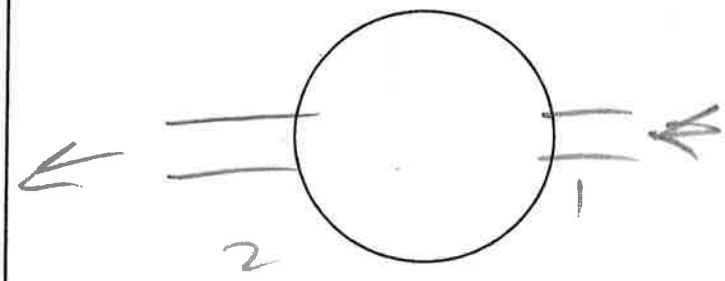
MANHOLE DESCRIPTION

1. Depth	5'-8"	4. Weather Conditions	SHOWERS
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	O/C
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☑ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections	CO	E. Steps	
B. Poured/Precast Base	/	F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North



Notes Maybe slight seepage
Steady 1/2 - 1/4"

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	CONC	CONC				
C. Height Above Channel						
D. Deposit Depth	0	-				
E. Deposit Type	-	-				
F. Flow Depth						
G. Flow Velocity FPS	1/2	1/2				
H. Joints Offset	NO	NO				
I. Joints Separated	"	"				
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	10:45	Manhole ID:	2.04	City:	SEKIU
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

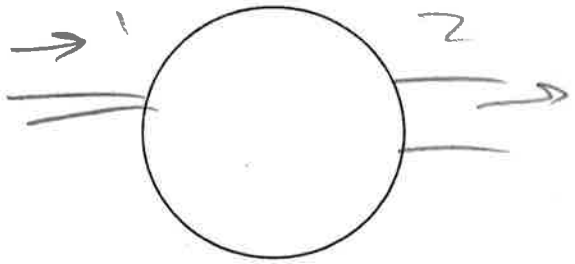
MANHOLE DESCRIPTION

1. Depth	6'	4. Weather Conditions	OVERCAST
2. Lid Condition		5. Water Table Above Channel	—
A. Diameter	STANDARD	6. Structural Condition	SEAL MISSING @ TOP
B. Number of Holes	1	A. Base	
C. Size of Holes	STANDARD	B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections	✓	E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North



Notes

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	4	6				
B. Material	PVC	CONC				
C. Height Above Channel	1'	0				
D. Deposit Depth	—	½"				
E. Deposit Type		DIRT/LEAVE				
F. Flow Depth	0	0				
G. Flow Velocity	0	0				
H. Joints Offset	0	0				
I. Joints Separated	0	0				
K. Joints Leak	0	0				
L. Root Growth	0	0				

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	5/10/18	Manhole ID:	2.01	City:	SEKIU
Date:	9:50	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOM / JOHN

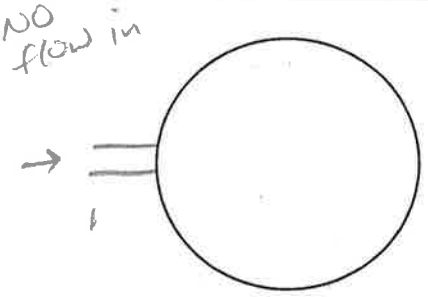
MANHOLE DESCRIPTION

1. Depth		4. Weather Conditions	OC
2. Lid Condition		5. Water Table Above Channel	Y
A. Diameter	6 +/-	6. Structural Condition	OK
B. Number of Holes	1	A. Base	
C. Size of Holes	1	B. Channel	
D. In Depression	☐ Yes ☑ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections	CONC	E. Steps	
B. Poured/Precast Base	?	F. Neck	
~~C. Brick~~		~~G. Casting~~	
D. Other		H. Other	

North/South Street:

East/West Street:

North ↑



Notes: Full of water +/- ~1' below NO visible outlet can hear water sounds but don't see any moving water

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8					
B. Material	CONC					
C. Height Above Channel	~1' above water					
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth						
G. Flow Velocity						
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	5/10/18	Manhole ID:	4110	City:	SEKIU
Date:	9:35 AM	Basin ID:		G&O Job:	# 18486
		Picture:	1200 - 1205	Crew:	JOHN / JOHN

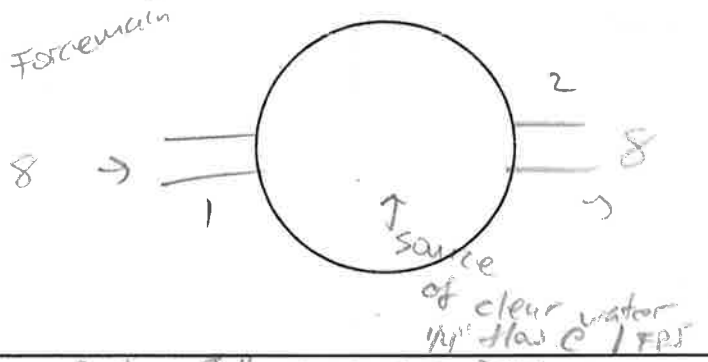
MANHOLE DESCRIPTION

1. Depth	5'	4. Weather Conditions	OC
2. Lid Condition		5. Water Table Above Channel	Y
A. Diameter		6. Structural Condition	
B. Number of Holes	1	A. Base	
C. Size of Holes	1	B. Channel	has leaks
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material		D. Cone	looks wet
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North ↑



Notes FROM HERE TO 11.09 PUT 8" SDR 35 PVC IN THIS YEAR - MATCHED EXIST IES new follows details

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	PVC	PVC				
C. Height Above Channel	2'	0				
D. Deposit Depth	-	-				
E. Deposit Type	-	-				
F. Flow Depth						
G. Flow Velocity						
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time: 5/10/18	Manhole ID: 4103	City:	SELAH
Date: 9:20 AM	Basin ID:	G&O Job: #	18486
	Picture: 1196 + 1197	Crew:	DOT + JOHN

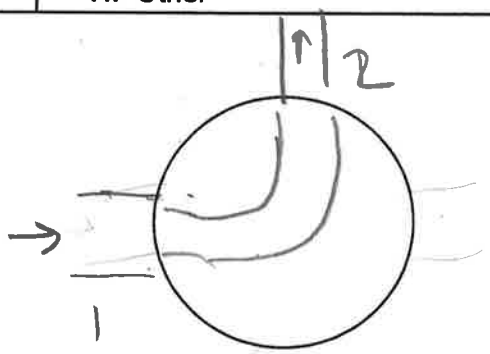
MANHOLE DESCRIPTION

1. Depth	4. Weather Conditions OC
2. Lid Condition GOOD	5. Water Table Above Channel
A. Diameter	6. Structural Condition
B. Number of Holes 1	A. Base
C. Size of Holes	B. Channel
D. In Depression ☐ Yes ☐ No	C. Sections
3. Material	D. Cone
A. Precast Sections	E. Steps
B. Poured/Precast Base	F. Neck
C. Brick	G. Casting
D. Other	H. Other

North/South Street:

East/West Street:

North ↑



Notes

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	PVC	PVC				
C. Height Above Channel	0	0				
D. Deposit Depth	0	0				
E. Deposit Type	—	—				
F. Flow Depth	1/2"	1/2"				
G. Flow Velocity FPS	2	2				
H. Joints Offset	NO	NO				
I. Joints Separated	"	"				
K. Joints Leak	"	"				
L. Root Growth	"	"				

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	9:25	Manhole ID:	4,04	City:	SEKIU
Date:	7/10/18	Basin ID:		G&O Job:	# 18486
		Picture:	1198 - 1199 - 1200	Crew:	DOTY / JOHN

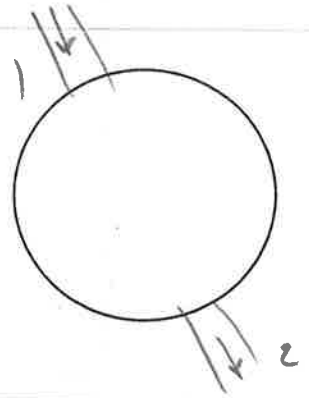
MANHOLE DESCRIPTION

1. Depth	SHALLOW	4. Weather Conditions	OC
2. Lid Condition		5. Water Table Above Channel	Yes ?
A. Diameter	\	6. Structural Condition	
B. Number of Holes	\	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☑ No	C. Sections	Some Seepage
3. Material		D. Cone	
A. Precast Sections	CONC	E. Steps	
B. Poured/Precast Base	/	F. Neck	
~~C. Brick~~	/	~~G. Casting~~	
D. Other		H. Other	

North/South Street:

East/West Street:

North ↑



Notes

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	CONC?	CONC?				
C. Height Above Channel						
D. Deposit Depth	—	—				
E. Deposit Type	—	—				
F. Flow Depth	1/2"	1/2"				
G. Flow Velocity FPS	2	2				
H. Joints Offset						
I. Joints Separated	SO					
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	10:00 AM	Manhole ID:	7.05	City:	SEKIU
Date:	5-11-2018	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

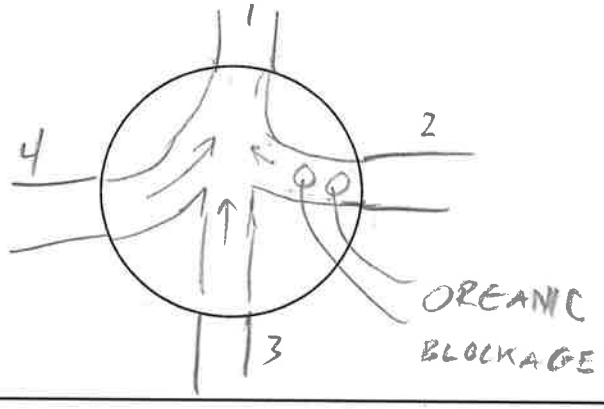
MANHOLE DESCRIPTION

1. Depth 12'	4. Weather Conditions
2. Lid Condition GOOD, SIGN OF	5. Water Table Above Channel
A. Diameter INFLOW	6. Structural Condition
B. Number of Holes (MUD)	A. Base
C. Size of Holes	B. Channel
D. In Depression ☐ Yes ☐ No	C. Sections 1" GAP IN ONE SECT.
3. Material	D. Cone ENTIRE CIRCUMFERANCE
A. Precast Sections ✓	E. Steps
B. Poured/Precast Base	F. Neck
C. Brick	G. Casting
D. Other	H. Other

North/South Street:

East/West Street:

North ↑



Notes

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8	8		
B. Material						
C. Height Above Channel	—	—	—	—		
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth						
G. Flow Velocity						
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	9:30 AM	Manhole ID:	3.06	City:	SEKIU
Date:	5-11-2018	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOM / JOHN

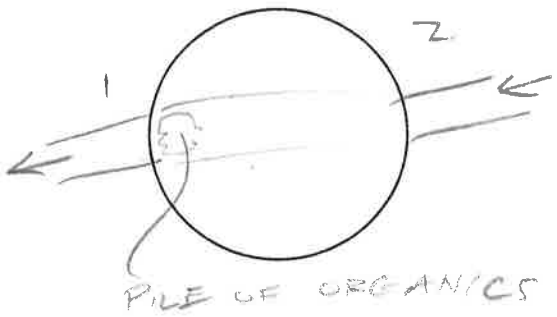
MANHOLE DESCRIPTION

1. Depth	20	4. Weather Conditions	SUNNY
2. Lid Condition	GOOD	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	GOOD
B. Number of Holes	1	A. Base	
C. Size of Holes	1"	B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street: HWY 112

North ↑



Notes PILE OF ORGANICS @ DOWNSTREAM PIPE CAUSING FLOW TO BACK UP.

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	CONC	CONC				
C. Height Above Channel	—	—				
D. Deposit Depth	—	—				
E. Deposit Type	—	—				
F. Flow Depth	SEE FLOW					
G. Flow Velocity	METER	DATA				
H. Joints Offset	—	—				
I. Joints Separated	—	—				
K. Joints Leak	—	—				
L. Root Growth	—	—				

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

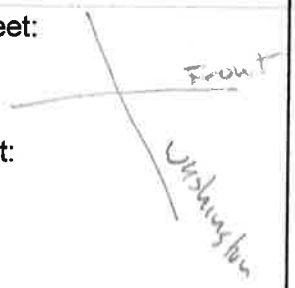
Time:	12:25	Manhole ID:	7109	City:	SEKIU
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOIY / JOHN

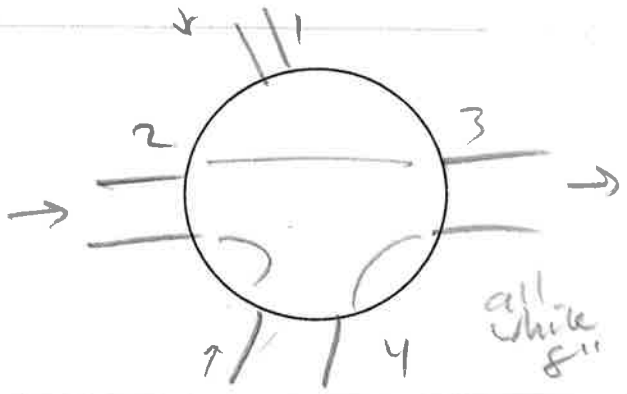
MANHOLE DESCRIPTION			
1. Depth		4. Weather Conditions	
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material	CONC.	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
~~C. Brick~~		~~G. Casting~~	
D. Other		H. Other	

North/South Street:

East/West Street:

North





Notes Kim - If raining 4 would show rock
some flow - 1/2 spin from up Washington
Bricks could be re-grouted

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	4"	8	8	8		
B. Material	PVC	PVC	PVC	CONC		
C. Height Above Channel	2'	-				
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1/4	- 1/8				
G. Flow Velocity	SLOW					
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	12:20	Manhole ID:	7-08	City:	SEKIU
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	TOM / JOHN

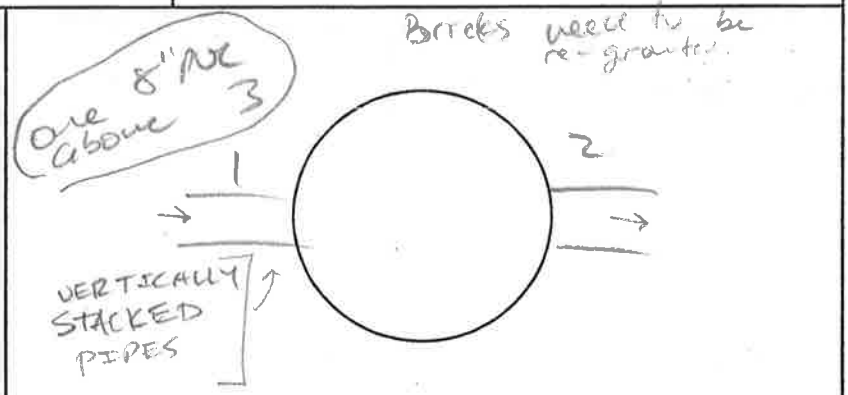
MANHOLE DESCRIPTION

1. Depth		4. Weather Conditions	
2. Lid Condition		5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☑ No	C. Sections	
3. Material	conc	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North



Notes: Bumped PSI + flow came out of top pipe - all pipes here are white

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	PVC	PVC	PVC			
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1/4"					
G. Flow Velocity	1/4					
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	11:00 AM	Manhole ID:	5102	City:	SEKIU
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

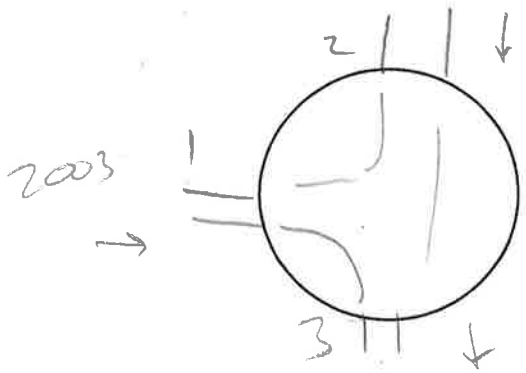
MANHOLE DESCRIPTION

1. Depth		4. Weather Conditions	CL
2. Lid Condition	O/C	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	O/C
B. Number of Holes	1	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: Funk + Ballard

East/West Street:

North



Notes: Some seepage from cone section clear constant flow from W pipe from N ~1/2

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	~~6~~ 8	8	8			
B. Material	PVC	CONC	CONC			
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type	TP	TP				
F. Flow Depth	1/2	1/4	1/2			
G. Flow Velocity	1 FPS	1/2 FPS	1 FPS			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	11:10	Manhole ID:	6.01	City:	SEKIU
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

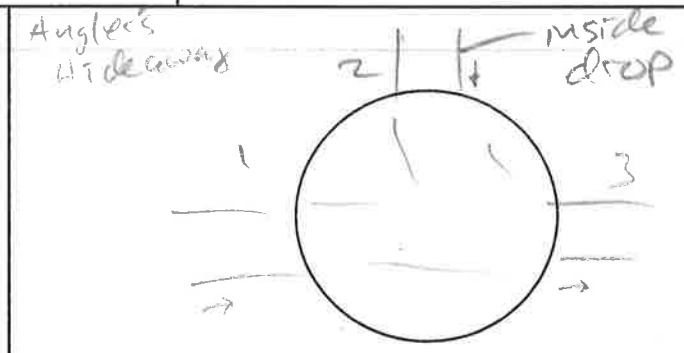
MANHOLE DESCRIPTION

1. Depth	6'-6"	4. Weather Conditions	OC
2. Lid Condition		5. Water Table Above Channel	
A. Diameter		6. Structural Condition	
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
~~C. Brick~~		~~G. Casting~~	
D. Other		H. Other	

North/South Street: West of Faunt-le-Roy

East/West Street:

North ↑



Notes: Slight seepage from lid on risers
flow split evenly between 1 + 2
both clear + out flow

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	PVC	PVC	PVC			
C. Height Above Channel						
D. Deposit Depth	NO	NO				
E. Deposit Type	NO	NO				
F. Flow Depth	1/4-1/2"	1/4-1/2"	~1/2"			
G. Flow Velocity	1 FPS	1 FPS	1			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	1145	Manhole ID:	7.06	City:	SEKIU
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DGM / JOHN

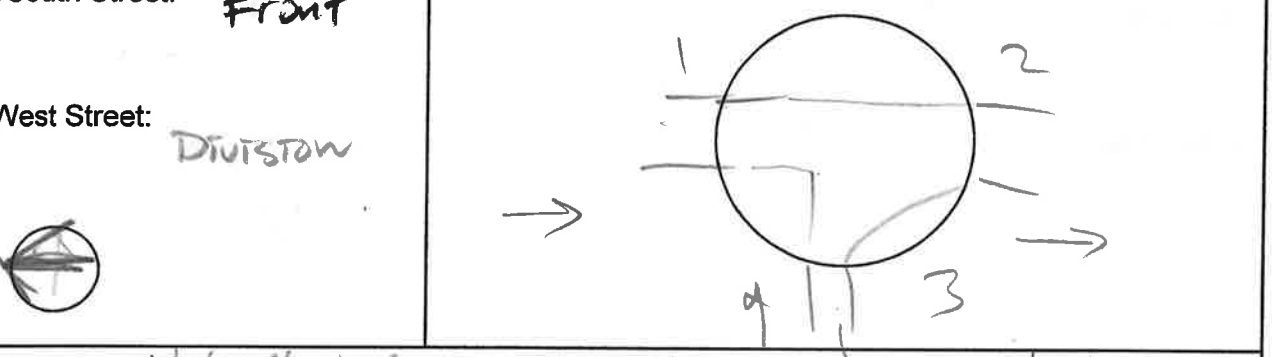
MANHOLE DESCRIPTION

1. Depth		4. Weather Conditions	OC
2. Lid Condition		5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☐ No	C. Sections	joints tight
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: Front

East/West Street: DIVISION

North



Notes from - filled flow from 3 in wet season

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	PVC	PVC	CONC			
C. Height Above Channel						
D. Deposit Depth	minimal					
E. Deposit Type	rocks + organics					
F. Flow Depth	1"					
G. Flow Velocity	1 FPS					
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	11:55	Manhole ID:	7107	City:	SEKIU
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOTM / JOHN

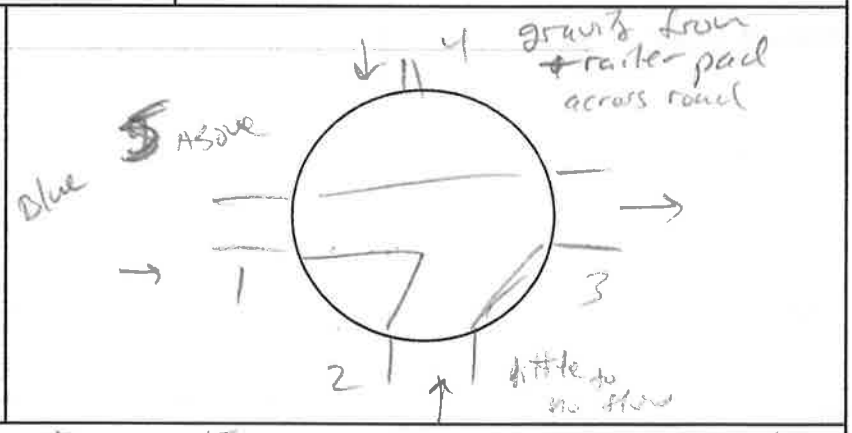
MANHOLE DESCRIPTION

1. Depth 6	4. Weather Conditions
2. Lid Condition	5. Water Table Above Channel
A. Diameter	6. Structural Condition
B. Number of Holes 1	A. Base
C. Size of Holes 1	B. Channel
D. In Depression ☐ Yes ☒ No	C. Sections
3. Material	D. Cone
A. Precast Sections	E. Steps
B. Poured/Precast Base	F. Neck riser joints have gaps
~~C. Brick~~	~~G. Casting~~
D. Other	H. Other

North/South Street: front

East/West Street: commercial

North



Notes Grout falling apart SEDIMENT coming IN From BRICKS
Found plywood in MH - cleared out has sediment
raw PS in hand + SW flow majority come thru bottom

PIPE DESCRIPTION PS pumps 170gpm ea - Olsons PS ~50gpm

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8	4"	8	
B. Material	PVC	CONC	PVC	PVC	PVC	
C. Height Above Channel	—	—	—	40"	16"	
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth						
G. Flow Velocity						
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	11:20	Manhole ID:	B106	City:	MIDDLE POINT
Date:	5/12/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOM / JOHN

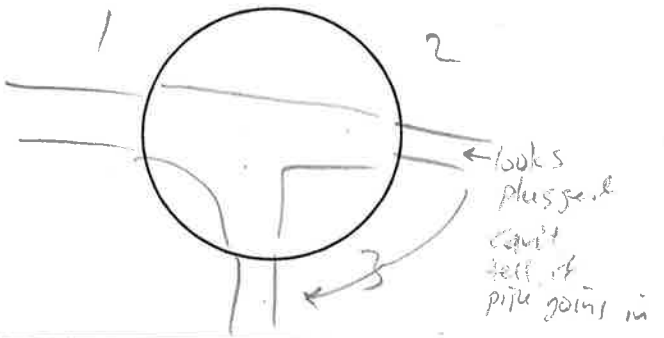
MANHOLE DESCRIPTION

1. Depth	4. Weather Conditions OC
2. Lid Condition	5. Water Table Above Channel
A. Diameter	6. Structural Condition ok
B. Number of Holes 1	A. Base
C. Size of Holes	B. Channel
D. In Depression ☐ Yes ☒ No	C. Sections
3. Material	D. Cone
A. Precast Sections	E. Steps
B. Poured/Precast Base	F. Neck
C. Brick	G. Casting
D. Other	H. Other risers dripping

North/South Street:

East/West Street:

North



Notes no flow recently, interior looks wet

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size						
B. Material						
C. Height Above Channel						
D. Deposit Depth	rocks	rocks	rocks			
E. Deposit Type	2/3	full	full			
F. Flow Depth						
G. Flow Velocity						
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	11:30 AM	Manhole ID:	B105	City:	MIDDLE POINT
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOTY / JOHN

MANHOLE DESCRIPTION

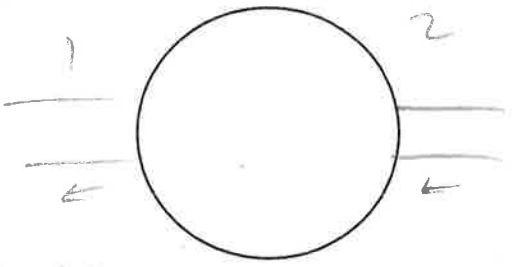
1. Depth		4. Weather Conditions	OC
2. Lid Condition		5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☑ Yes ☐ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North ↑

EDGES OF RISER HAVE MUD IN DIP



cover leaking

Notes IN E. Bound lane of HWY

steady & clear w/ some increase & decrease in flow

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	cast pvc	PVC				
C. Height Above Channel						
D. Deposit Depth	Some Sediment					
E. Deposit Type	rocks + sludge					
F. Flow Depth	1/2" +	1/2				
G. Flow Velocity	1/2	1/2				
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	3:20	Manhole ID:	14.01	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOM / JOHN

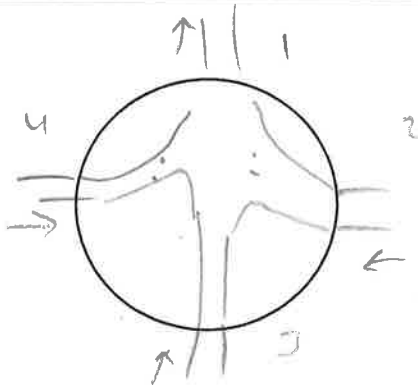
MANHOLE DESCRIPTION MANHOLE # 14.01

1. Depth	6	4. Weather Conditions	OC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North 



Notes MH in floor area
Cone to Barrel section shows some seepage

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8	8		
B. Material	?	?	?	?		
C. Height Above Channel						
D. Deposit Depth	minor	sediment				
E. Deposit Type						
F. Flow Depth	1/2	1/4-1/2	—	1/8		
G. Flow Velocity	1	1	—	1		
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	3:30	Manhole ID:	16.01	City:	Clallam Bay
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

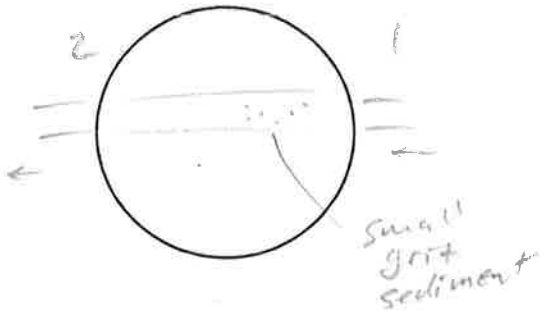
MANHOLE DESCRIPTION

1. Depth	7	4. Weather Conditions	OC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North ↑



Notes NOT MUCH EVIDENCE OF SEEPAGE

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material						
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1/2	1/2				
G. Flow Velocity FPS	1/2	1/2				
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	2:10 P	Manhole ID:	18,06A	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOTY / JOHN

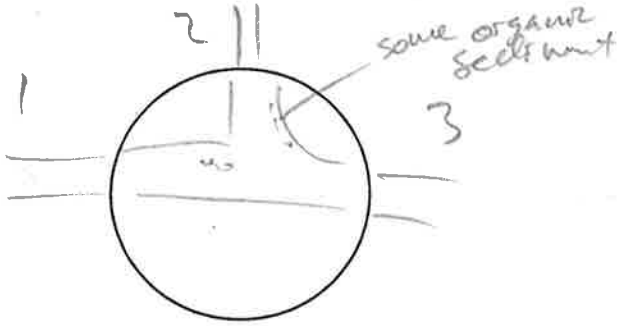
MANHOLE DESCRIPTION

1. Depth	10	4. Weather Conditions	OC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression ☐ Yes ☐ No		C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: 112

East/West Street: 8th

North →



Notes: Barrel joints look like they are seeping

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	10			
B. Material	?	?	?			
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1/4	1/4				
G. Flow Velocity FPS	2+	2+				
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	2:20	Manhole ID:	18108	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

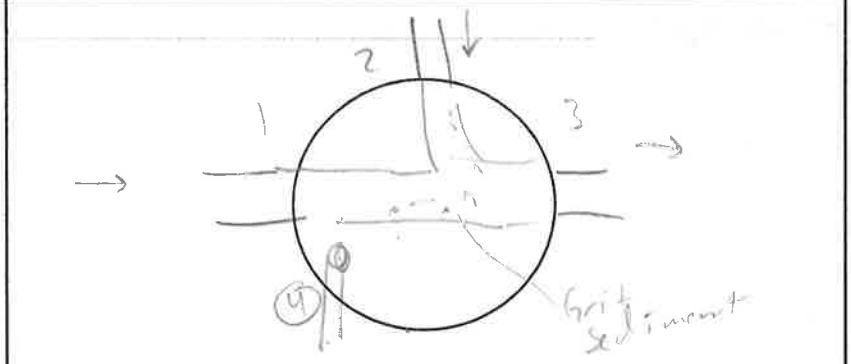
MANHOLE DESCRIPTION

1. Depth	4. Weather Conditions TPC
2. Lid Condition O/C	5. Water Table Above Channel
A. Diameter	6. Structural Condition O/C
B. Number of Holes	A. Base
C. Size of Holes	B. Channel
D. In Depression ☐ Yes ☑ No	C. Sections
3. Material	D. Cone
A. Precast Sections	E. Steps
B. Poured/Precast Base	F. Neck
C. Brick	G. Casting
D. Other	H. Other

North/South Street: 112

East/West Street: EEV

North →



Notes (4) 2" from grinder pumps @ Clallam Bay Apts
Lid was buried in grass
may be seepage @ joints in barrel section joints

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8	2"		
B. Material	?	PVC	?	PVC		
C. Height Above Channel						
D. Deposit Depth	grit					
E. Deposit Type						
F. Flow Depth	1/8	1/4	1/4			
G. Flow Velocity	1/4	1	1			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:		Manhole ID:	18102	City:	CLALLAM BAY
Date:	5/11/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOUG / JOHN

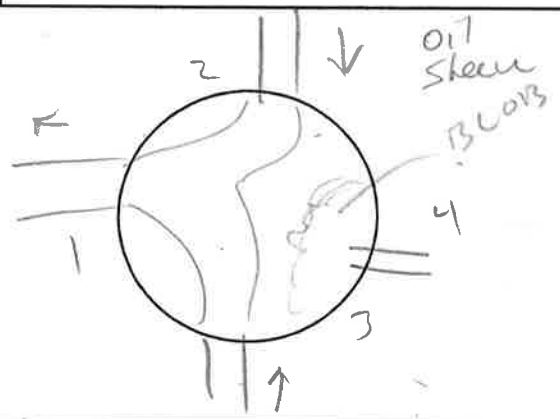
MANHOLE DESCRIPTION

1. Depth		4. Weather Conditions	OC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North ↑



Notes Giant Blob of Iron below 4"
Bricks need to be grouted - source of I/I
Maybe I/I with Iron seepage also

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	10	8	8	4		
B. Material						
C. Height Above Channel	—	—	—	3		
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1" ++	1"+	1"			
G. Flow Velocity	1/4 FPS	1/4 FPS	1/4 FPS			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	2:05	Manhole ID:	18.05	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	TOM JOHN

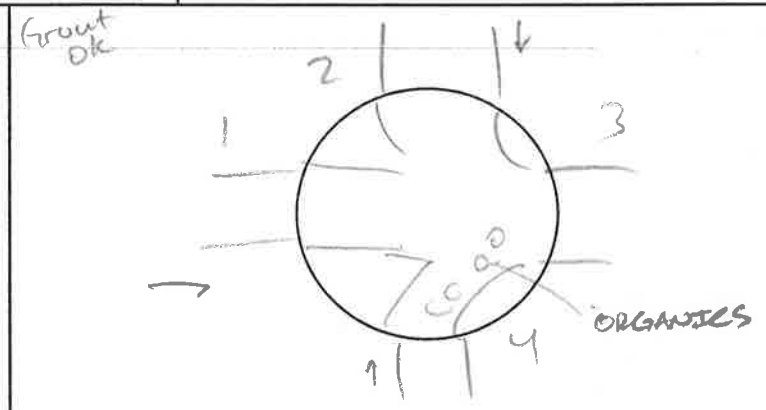
MANHOLE DESCRIPTION

1. Depth		4. Weather Conditions	
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☑ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: 112

East/West Street: 7th

North →



Notes: Somewhat corst. from 4 + 1

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	10	8	10	8		
B. Material	PVC	PVC	PVC	CONC		
C. Height Above Channel						
D. Deposit Depth		—				
E. Deposit Type		—				
F. Flow Depth	1"	—	1"+	1/2		
G. Flow Velocity	2	—	2	1/2		
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

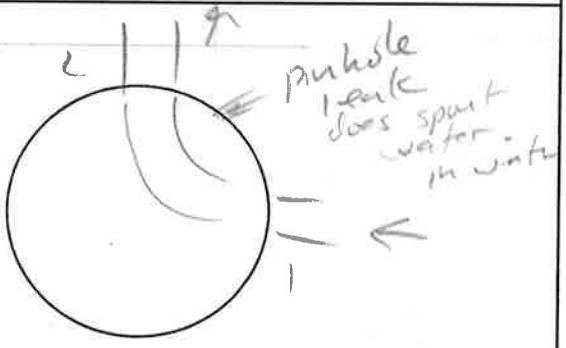
Time:	2:55	Manhole ID:	2503	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

MANHOLE DESCRIPTION			
1. Depth	4	4. Weather Conditions	OC
2. Lid Condition	OC	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression ☐ Yes ☒ No		C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North →



Notes NO FLOW, MANHOLE DOES HAVE DEFECT PER KIM

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	?	?				
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	—					
G. Flow Velocity	—					
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	2:40	Manhole ID:	19.07	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOM / JOHN

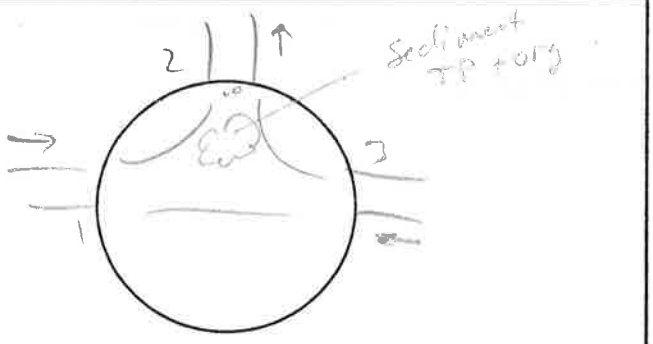
MANHOLE DESCRIPTION

1. Depth	7	4. Weather Conditions	OC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: Bagnachiel

East/West Street: Kellogg

North ↑



Notes: Leaking joints in barrel section

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	?	?	?			
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1/4	1/2	1/8			
G. Flow Velocity	1	1	1			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	1130	Manhole ID:	26102	City:	Clallam Bay
Date:	5/10/18	Basin ID:		G&O Job:	# 184186
		Picture:		Crew:	DOTY / JOHN

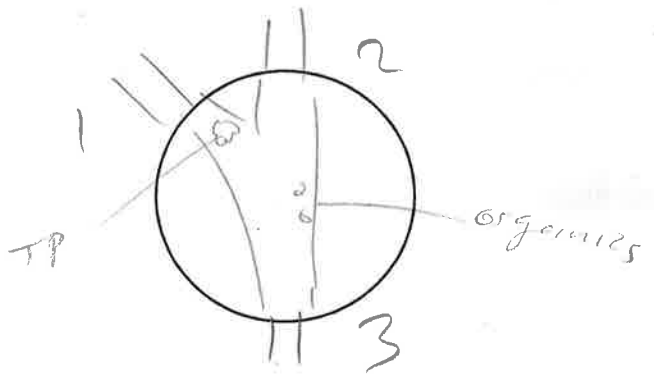
MANHOLE DESCRIPTION

1. Depth	12 +/-	4. Weather Conditions	showers
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes	1	A. Base	
C. Size of Holes	1	B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: Bogachiel

East/West Street: 112

North ↑



Notes some leaking @ riser rings

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	CONC	PVC	CONC			
C. Height Above Channel						
D. Deposit Depth	1"					
E. Deposit Type						
F. Flow Depth	1/4 - 1/2	1/4 - 1/2				
G. Flow Velocity	1	1				
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	1:33	Manhole ID:	26103	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

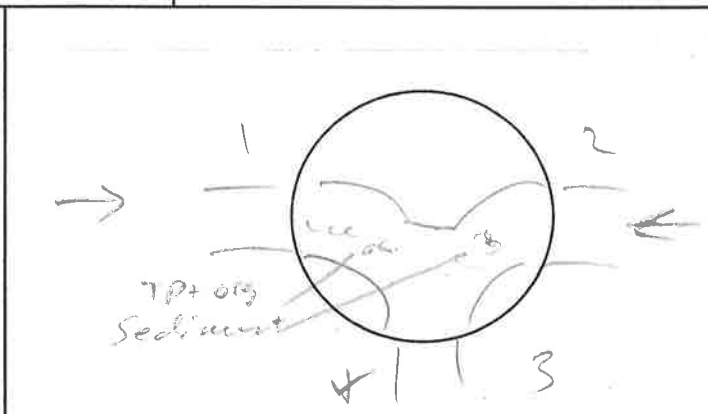
MANHOLE DESCRIPTION

1. Depth	10	4. Weather Conditions	OC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☑ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: Bogachiel

East/West Street: 112

North ↑



Notes: most flow from east
mh looks pretty dry

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	PVC	?	PVC			
C. Height Above Channel						
D. Deposit Depth	1/2"-1"	1"				
E. Deposit Type						
F. Flow Depth			1			
G. Flow Velocity	1	0	1/2			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	1:05	Manhole ID:	3201	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOM / JOHN

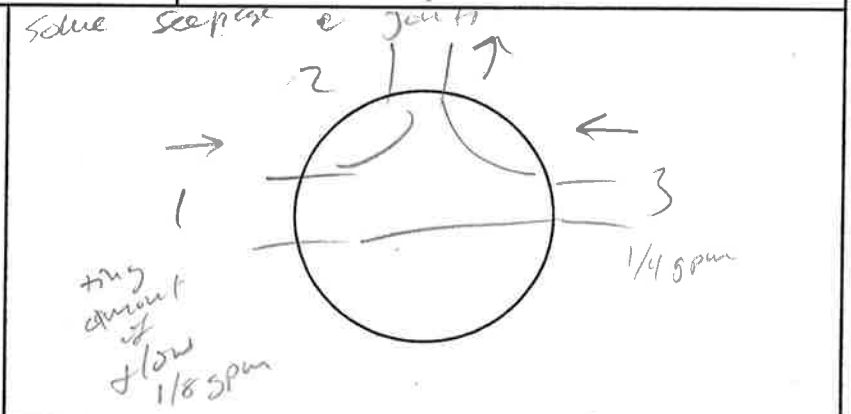
MANHOLE DESCRIPTION

1. Depth	6	4. Weather Conditions	OC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☒ Yes (Buried) ☐ No	C. Sections	
3. Material		D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: CLALLAM

East/West Street: 6th

North ↑



Notes: LID WAS BURIED UNDER ASPHALT ON ARRIVAL, NOW IN DEPRESSION

Grout looks good @ risers

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	CONC	CONC	CONC			
C. Height Above Channel						
D. Deposit Depth	—	—	—			
E. Deposit Type	—	—	—			
F. Flow Depth	Negligible	—	—			
G. Flow Velocity	—	—	—			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	1:25	Manhole ID:	2601	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOM / JOHN

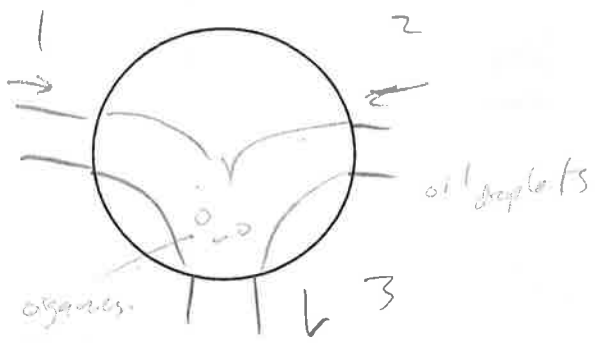
MANHOLE DESCRIPTION

1. Depth	6	4. Weather Conditions	showers
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☑ Yes ☐ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: Pogue Hill

East/West Street: 5th

North ↑



Notes LID WAS BURIED on arrival, NOW EXCAVATED AND IN DEPRESSION

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	CONC	CONC	CONC			
C. Height Above Channel						
D. Deposit Depth	sparse	sparse				
E. Deposit Type	fine rocks	rocks				
F. Flow Depth	1/4"	1/2" - 1"				
G. Flow Velocity	1 FPS	1-2 FPS				
H. Joints Offset	—	—				
I. Joints Separated	—	—				
K. Joints Leak	—	—				
L. Root Growth	—	—				

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	1:00	Manhole ID:	3/102	City:	CLALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOM / JOHN

MANHOLE DESCRIPTION

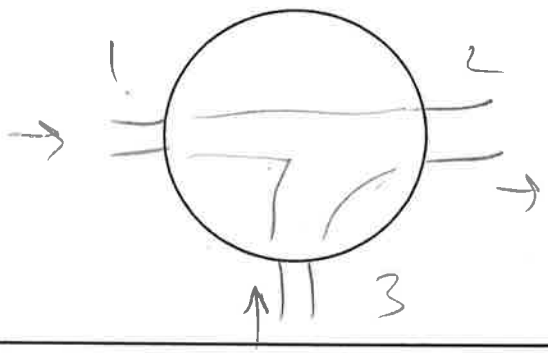
1. Depth	7'	4. Weather Conditions	∝
2. Lid Condition	ok	5. Water Table Above Channel	?
A. Diameter		6. Structural Condition	ok
B. Number of Holes	0	A. Base	
C. Size of Holes	0	B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street: KA LAWA

East/West Street: 112

North

Seepage @ riser to cone joint



Notes Some seepage @ rim/riser to cone

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	PVC	?	?			
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	–	1/4"	1/4"			
G. Flow Velocity	–	1/2-1"	1/2-1 FPS			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	12:35	Manhole ID:	7.00	City:	SELAH
Date:	5/10/18	Basin ID:		G&O Job:	# 18486
		Picture:		Crew:	DOTY / JOHN

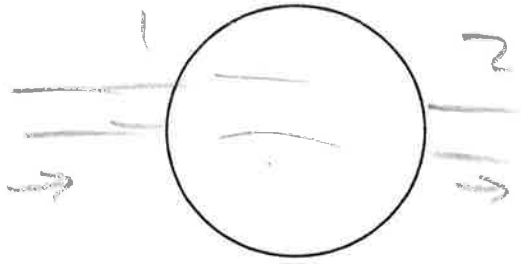
MANHOLE DESCRIPTION

1. Depth	5'	4. Weather Conditions	OC
2. Lid Condition	o/c	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	o/c
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☑ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North



Notes Brinks need to be grouted

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	PVC	PVC				
C. Height Above Channel	—	—				
D. Deposit Depth	1/2"	1/2"				
E. Deposit Type	Organic					
F. Flow Depth	small					
G. Flow Velocity	Small					
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	2:40	Manhole ID:	19.06	City:	CHALLAM BAY
Date:	5/10/18	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOTY / JOHN

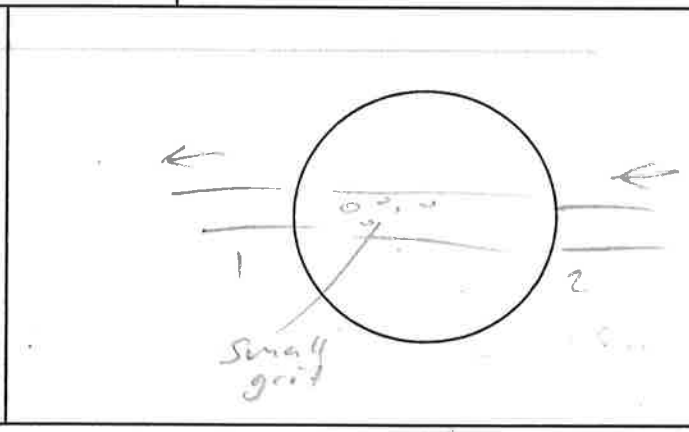
MANHOLE DESCRIPTION

1. Depth	10	4. Weather Conditions	CLEAR
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes	0	A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
~~C. Brick~~		~~G. Casting~~	
D. Other		H. Other	

North/South Street:

East/West Street:

North



Notes: Seepage - small amt from joints in barrel section

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material	?	?				
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1/4 to 1/2	1/2				
G. Flow Velocity	1	1/2				
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	2:35	Manhole ID:	19:05	City:	Clallam Bay
Date:	5/10-18	Basin ID:		G&O Job: #	18186
		Picture:		Crew:	DOTY, JOHN

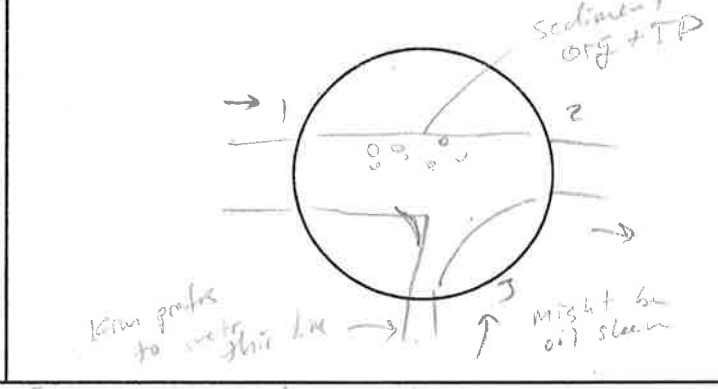
MANHOLE DESCRIPTION

1. Depth	7'	4. Weather Conditions	PC
2. Lid Condition	OK	5. Water Table Above Channel	
A. Diameter		6. Structural Condition	OK
B. Number of Holes		A. Base	
C. Size of Holes		B. Channel	
D. In Depression	☐ Yes ☒ No	C. Sections	
3. Material	CONC	D. Cone	
A. Precast Sections		E. Steps	
B. Poured/Precast Base		F. Neck	
C. Brick		G. Casting	
D. Other		H. Other	

North/South Street:

East/West Street:

North ↑



Notes some seepage @ joints in barrel section
Saw good flow from 1
Seepage from lid

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8	8			
B. Material	?	?	?			
C. Height Above Channel						
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	1/2	1	1			
G. Flow Velocity	2	1	1/2			
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth						

MANHOLE INSPECTION RECORD

Gray & Osborne, Inc.

Time:	10:30	Manhole ID:	13.03	City:	MIDDLE PT
Date:	5-11-2018	Basin ID:		G&O Job: #	18486
		Picture:		Crew:	DOM / JOHN

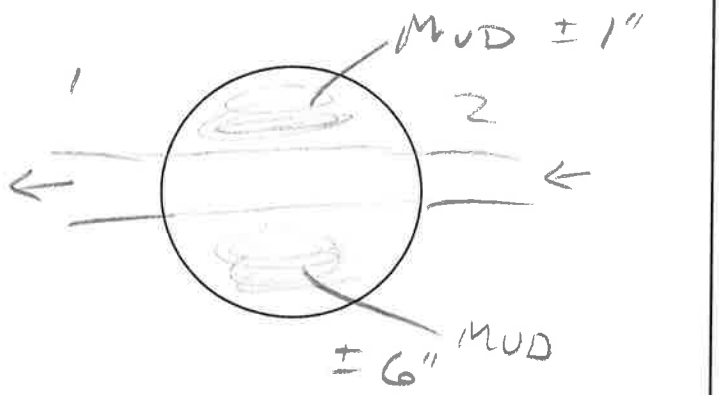
MANHOLE DESCRIPTION

1. Depth 5	4. Weather Conditions CLEAR
2. Lid Condition GOOD - SMALL	5. Water Table Above Channel
A. Diameter	6. Structural Condition GOOD
B. Number of Holes 1	A. Base
C. Size of Holes 1	B. Channel
D. In Depression ☒ Yes ☐ No (TINY DEPRESSION RD.)	C. Sections
3. Material CONC	D. Cone
A. Precast Sections	E. Steps
B. Poured/Precast Base	F. Neck
C. Brick	G. Casting
D. Other	H. Other

North/South Street:

East/West Street:

North ↑



Notes STEADY, CLEAR FLOW
LOTS OF MUD ON WALLS AND SIDE OF CHANNEL
LID DOES NOT FIT PROPERLY ON RIM - TOO SMALL

PIPE DESCRIPTION

Pipe Number	1	2	3	4	5	6
A. Pipe Size	8	8				
B. Material						
C. Height Above Channel	—	—				
D. Deposit Depth						
E. Deposit Type						
F. Flow Depth	SEE	FLOW				
G. Flow Velocity	METER	DATA				
H. Joints Offset						
I. Joints Separated						
K. Joints Leak						
L. Root Growth	—	—				

APPENDIX E

CLOSED CIRCUIT TELEVISION RESULTS

POSM SOFTWARE

Project Name: mh-13.01 to mh-13.02

Date: 8/30/2018 10:47:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 404	**End ID:**
Run Number:	**Direction:** Upstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
68.3	**Tap T3** **Severity: None**	01:53	
282.3	**Tap T3** **Severity: None**	07:39	
380.9	**Tap T3** **Severity: None**	10:26	

			 MH TO MH 8/30/2018 mh-13.01 to 10:57 Tap T3 380.9 FT

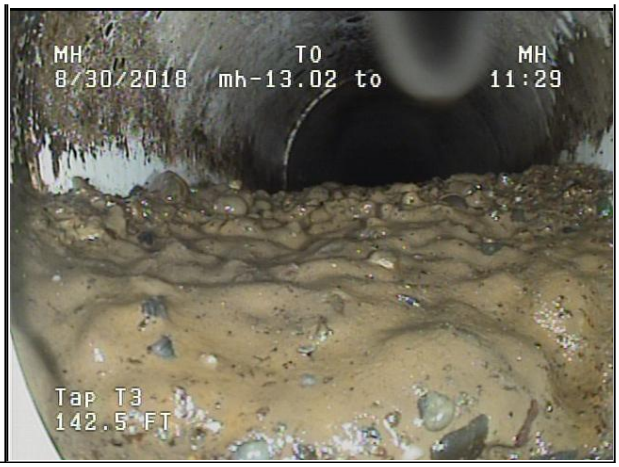
Distance	Fault Observation	Time	Picture
404.0	Manhole Severity: None	11:24	

Created with the POSM report generator Back

Project Name: mh-13.02 to mh-13.03

Date: 8/30/2018 11:23:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 406.6	**End ID:**
Run Number:	**Direction:** Upstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
25.2	Tap T3 Severity: None	46	
33.7	Tap T3 Severity: None	01:17	
142.5	Tap T3 Severity: None	04:19	

			 MH 8/30/2018 TO mh-13.02 to MH 11:29 Tap T3 142.5 FT

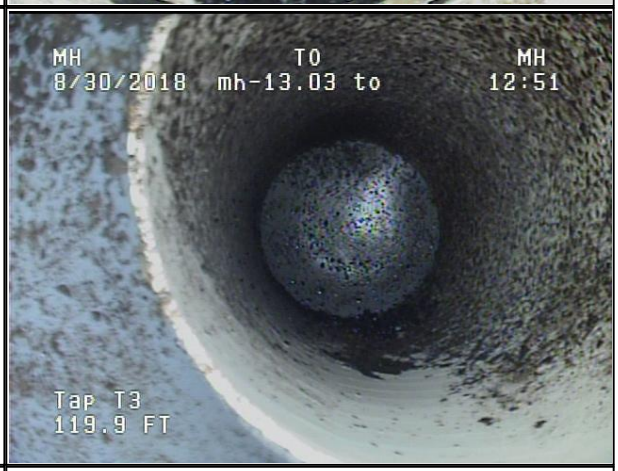
Distance	Fault Observation	Time	Picture
266.4	Tap T3 Severity: None	07:46	
406.6	Manhole Severity: None	11:37	

Created with the POSM report generator Back

POSM SOFTWARE

Project Name: mh-13.03 to mh-13.04

Date: 8/30/2018 12:21:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 407.6	**End ID:**
Run Number:	**Direction:** Upstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
16.9	**Tap T3** **Severity: None**	35	
119.9	**Tap T3** **Severity: None**	03:29	
189.9	**Tap T3** **Severity: None**	05:31	

			 MH TO MH 8/30/2018 mh-13.03 to 12:53 Tap T3 189.9 FT

Distance	Fault Observation	Time	Picture
407.6	Manhole Severity: None	11:27	

Created with the POSM report generator Back

POSM SOFTWARE

Project Name: mh-13.04 to mh-13.05

Date: 8/30/2018 1:13:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 304.3	**End ID:**
Run Number:	**Direction:** Upstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
21.7	Tap T3 Severity: None	42	
221.1	Tap T3 Severity: None	05:59	
304.3	Manhole Severity: None	08:33	

Created with the POSM **report generator** Back

Project Name: mh-13.05 to mh-13.06

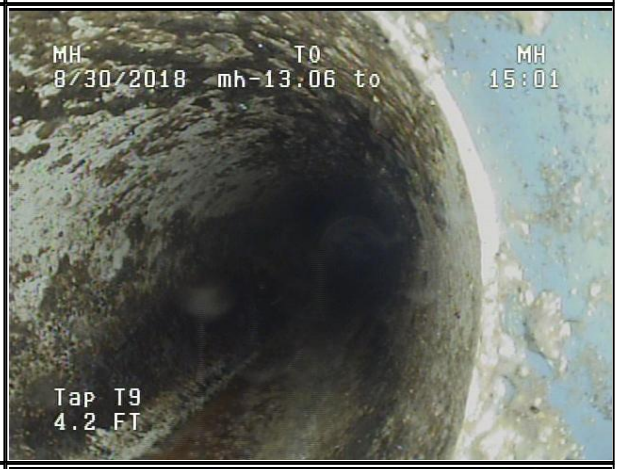
Date: 8/30/2018 2:28:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 301.9	**End ID:**
Run Number:	**Direction:** Upstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
301.9	**Tap T3** **Severity: None**	**07:44**	

Created with the **report generator** Back

Project Name: mh-13.06 to mh-13.05

Date: 8/30/2018 3:00:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 70.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

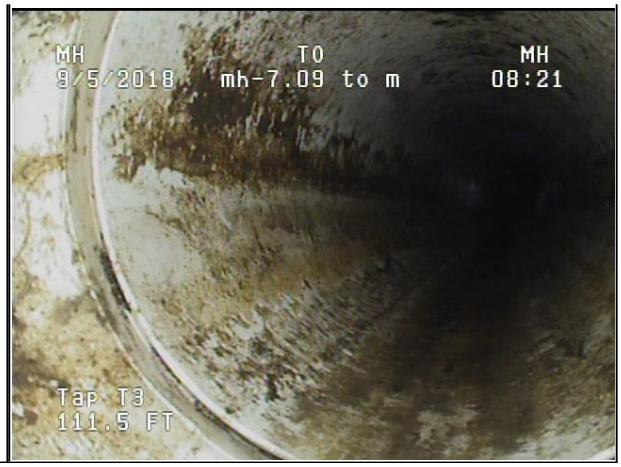
Distance	Fault Observation	Time	Picture
4.2	**Tap T9** **Severity: None**	40	
70.4	**End Inspection** **Severity: None**	03:06	

Created with the **report generator** Back

Project Name: mh-7.09 to mh-7.08

Date: 9/5/2018 8:02:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 170.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
8.2	**Tap T9** **Severity: None**	26	
54.6	**Tap T3** **Severity: None**	02:06	
111.5	**Tap T3** **Severity: None**	03:47	

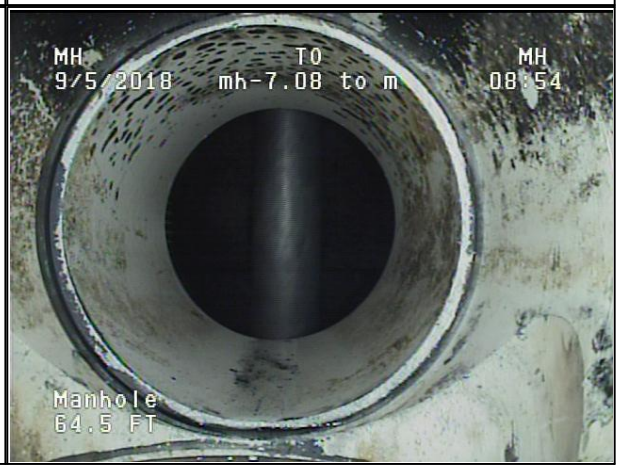
			 MH TO MH 9/5/2018 mh-7.09 to m 08:21 Tap T3 111.5 FT

Distance	Fault Observation	Time	Picture
170.4	Manhole Severity: None	05:37	

Created with the POSM report generator Back

Project Name: mh-7.08 to mh-7.07

Date: 9/5/2018 8:29:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 64.5	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
64.5	**Manhole** **Severity: None**	**03:37**	

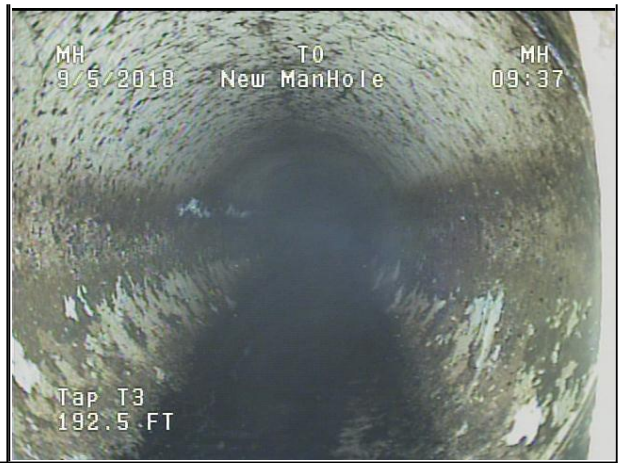
Created with the **report generator** Back

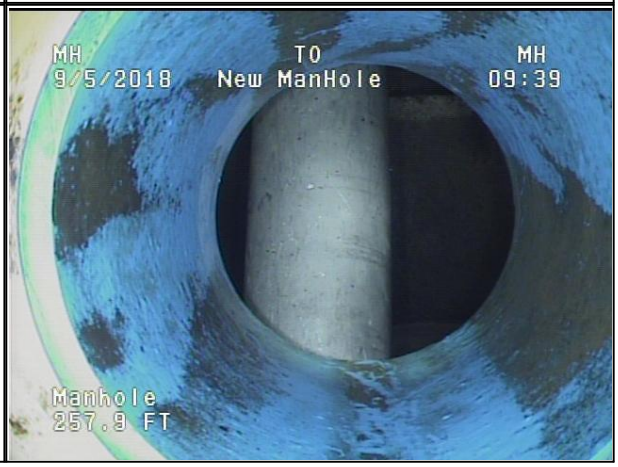
POSM SOFTWARE

Project Name: New ManHole to mh-7.07

Date: 9/5/2018 9:12:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 257.9	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
64.5	**Tap T3** **Severity: None**	01:44	
112.0	**Tap T3** **Severity: None**	3:10	
192.5	**Tap T3** **Severity: None**	05:29	

			 MH 9/5/2018 T0 New ManHole MH 09:37 Tap T3 192.5 FT

Distance	Fault Observation	Time	Picture
257.9	Manhole Severity: None	07:22	

Created with the POSM report generator Back

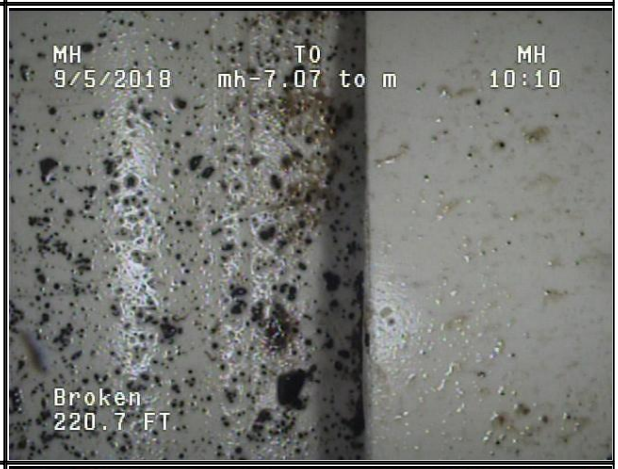
POSM SOFTWARE

Project Name: mh-7.07 to mh-7.06

Date: 9/5/2018 10:01:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 294.8	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
67.8	**Tap T3** **Severity: None**	01:50	
169.8	**Tap T3** **Severity: None**	04:45	
218.4	**Tap T3** **Severity: None**	06:17	

			 MH TO MH 9/5/2018 mh-7.07 to m 10:10 Tap T3 218.4 FT

Distance	Fault Observation	Time	Picture
220.7	Broken Severity: None	06:52	
241.1	Tap T3 Severity: None	07:58	
294.8	Manhole Severity: None	09:42	

Created with the POSM report generator Back

POSM SOFTWARE

Project Name: mh-7.06 to mh-7.05

Date: 9/5/2018 10:42:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 253.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
28.5	**Tap T3** **Severity: None**	50	
101.5	**Tap T3** **Severity: None**	02:58	
224.3	**Tap T3** **Severity: None**	06:24	

			 MH 9/5/2018 TO mh 7.06 to m MH 11:19 Tap T3 224.3 FT

Distance	Fault Observation	Time	Picture
253.4	Manhole Severity: None	07:27	

Created with the POSM report generator Back

Project Name: mh-7.04 to mh-7.05

Date: 9/5/2018 1:11:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 68.3	**End ID:**
Run Number:	**Direction:** Upstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
68.3	Manhole Severity: None	01:57	

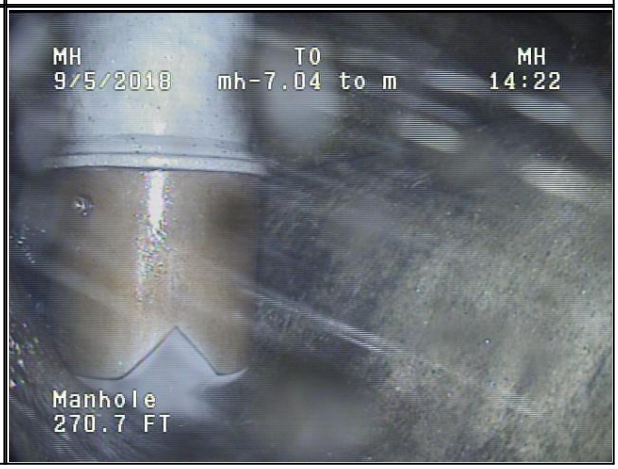
Created with the **report generator** Back

Project Name: mh-7.04 to mh-7.03

Date: 9/5/2018 1:27:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 270.7	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
58.1	**Tap T3** **Severity: None**	01:35	
133.6	**Tap T3** **Severity: None**	04:13	
190.6	**Tap T3** **Severity: None**	06:11	

			 MH 9/5/2018 TO mh-7.04 to m MH 14:12 Tap T3 190.6 FT

Distance	Fault Observation	Time	Picture
270.7	Manhole Severity: None	09:42	

Created with the POSM report generator Back

Project Name: mh-7.03 to mh-7.02

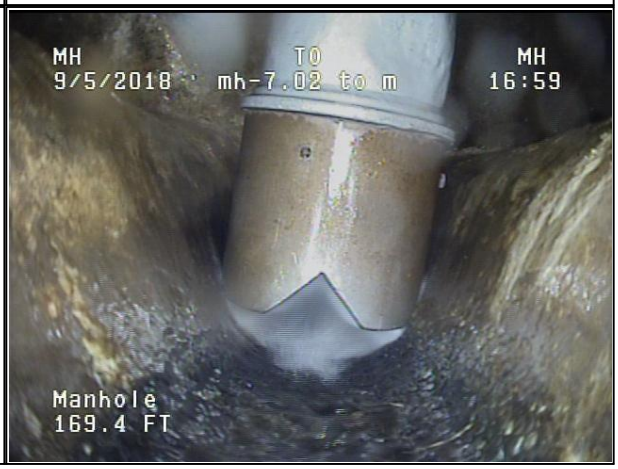
Date: 9/5/2018 2:52:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 375.9	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
196.7	**Tap T3** **Severity: None**	**05:01**	
375.9	**Manhole** **Severity: None**	**11:56**	

Created with the **report generator** Back

Project Name: mh-7.02 to mh-7.01

Date: 9/5/2018 4:01:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 169.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
169.4	**Manhole** **Severity: None**	**05:51**	

Created with the **report generator** Back

Project Name: mh-3.13 to mh-3.12

Date: 8/28/2018 11:53:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 354.3	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
354.3	**Manhole** **Severity: None**	**09:54**	

Created with the **report generator** Back

Project Name: mh-3.12 to mh-3.11

Date: 8/28/2018 12:35:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 354.5	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
354.5	**Manhole** **Severity: None**	**10:54**	

Created with the **report generator** Back

Project Name: mh-3.11 to mh-3.10

Date: 8/28/2018 1:12:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 353.8	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
353.8	**Manhole** **Severity: None**	**11:46**	

Created with the **report generator** Back

POSM SOFTWARE

Project Name: mh-3.10 to mh-3.09

Date: 8/28/2018 2:11:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 357.5	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

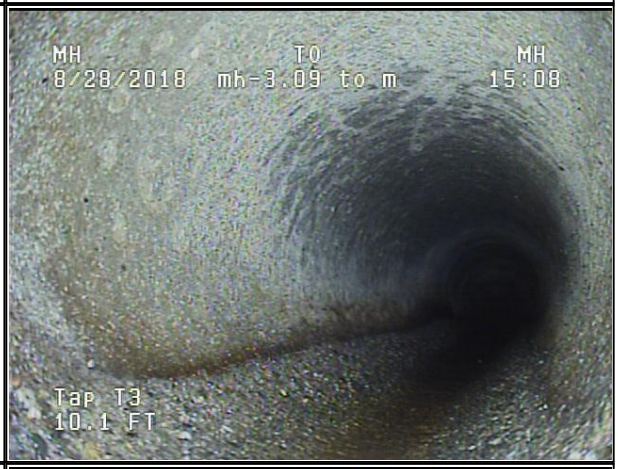
Distance	Fault Observation	Time	Picture
37.0	Tap T3 Severity: None	01:29	
274.6	Tap T3 Severity: None	09:11	
357.5	Manhole Severity: None	12:28	

Created with the POSM **report generator** Back

Project Name: mh-3.09 to mh-3.08

Date: 8/28/2018 3:07:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 418.9	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
10.1	**Tap T3** **Severity: None**	26	
116.9	**Tap T3** **Severity: None**	03:52	
120.6	**Tap T3** **Severity: None**	04:25	

			 MH 8/28/2018 TO mh-3.09 to m MH 15:12 Tap T3 120.6 FT

Distance	Fault Observation	Time	Picture
308.8	Tap T3 Severity: None	11:08	
380.9	Tap T3 Severity: None	02:03	
418.9	Manhole Severity: None	03:43	

Created with the POSM report generator Back

Project Name: mh-3.08 to mh-3.07

Date: 8/29/2018 8:13:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 394.2	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
58.2	**Tap T9** **Severity: None**	01:46	
96.7	**Tap T3** **Severity: None**	03:16	
225.5	**Tap T3** **Severity: None**	08:12	

			 MH TO MH 8/29/2018 mh-3.08 to m 08:21 Tap T3 225.5 FT

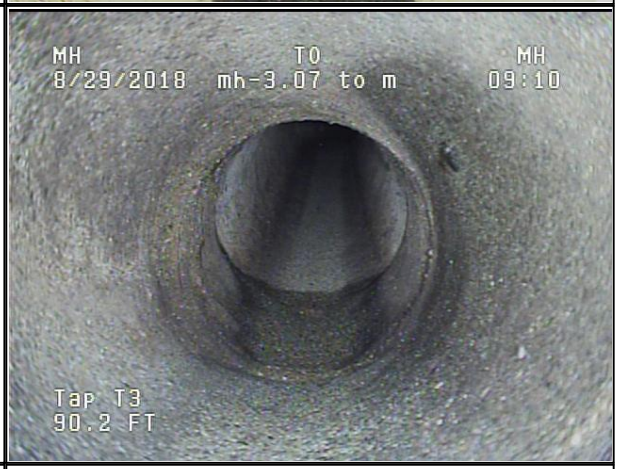
Distance	Fault Observation	Time	Picture
278.8	Tap T9 Severity: None	11:38	
287.3	Tap T3 Severity: None	12:14	
394.2	Manhole Severity: None	15:39	

Created with the POSM report generator Back

POSM SOFTWARE

Project Name: mh-3.07 to mh-3.06

Date: 8/29/2018 9:07:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 203.3	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
67.0	**Tap T9** **Severity: None**	02:21	
90.2	**Tap T3** **Severity: None**	03:20	
203.3	**Manhole** **Severity: None**	07:34	

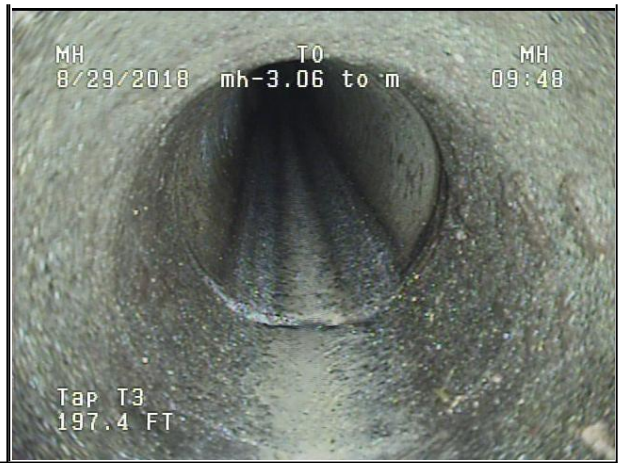
			

Created with the POSM **report generator** Back

Project Name: mh-3.06 to mh-3.05

Date: 8/29/2018 9:41:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 405.6	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
9.7	**Tap T3** **Severity: None**	38	
63.5	**Tap T9** **Severity: None**	02:18	
197.4	**Tap T3** **Severity: None**	06:31	

			 MH TO MH 8/29/2018 mh-3.06 to m 09:48 Tap T3 197.4 FT

Distance	Fault Observation	Time	Picture
293.5	Tap T3 Severity: None	10:17	
388.6	Tap T3 Severity: None	13:12	
392.0	Tap T9 Severity: None	13:51	

Distance	Fault Observation	Time	Picture
405.6	Manhole Severity: None	15:34	

Created with the POSM report generator Back

Project Name: mh-3.05 to new manhole

Date: 8/29/2018 10:36:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 191.2	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
76.1	**Tap T3** **Severity: None**	02:13	
129.8	**Tap T3** **Severity: None**	04:36	
191.2	**Manhole** **Severity: None**	07:05	

Created with the POSM **report generator** Back

POSM SOFTWARE

Project Name: new manhole to mh-3.04	
Date: 8/29/2018 11:52:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 213.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
104.6	**Tap T3** **Severity: None**	**03:01**	
162.3	**Tap T3** **Severity: None**	**04:48**	
213.4	**Manhole** **Severity: None**	**06:35**	

Created with the POSM **report generator** Back

POSM SOFTWARE

Project Name: mh-3.04 to mh-3.03

Date: 8/29/2018 12:58:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 408.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
96.2	Tap T3 Severity: None	02:44	
286.9	Tap T3 Severity: None	08:24	
408.4	Manhole Severity: None	12:24	

Created with the POSM **report generator** Back

Project Name: mh-3.03 to mh-3.02

Date: 8/29/2018 2:08:00 PM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 405.5	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
6.8	Tap T3 Severity: None	24	
216.0	Tap T3 Severity: None	06:22	
287.0	Tap T3 Severity: None	08:41	

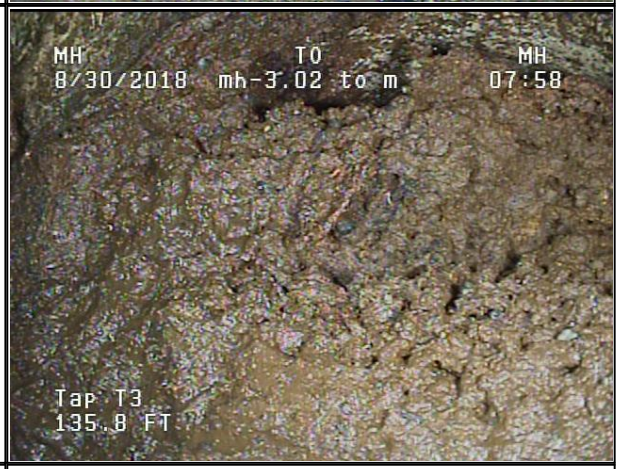
			 MH TO MH 8/29/2018 mh-3.03 to m 15:33 Tap T3 287 FT

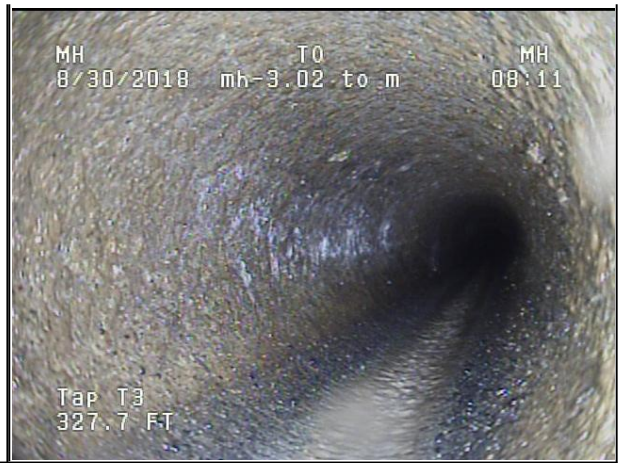
Distance	Fault Observation	Time	Picture
405.5	Manhole Severity: None	12:14	

Created with the POSM report generator Back

Project Name: mh-3.02 to mh-3.01

Date: 8/30/2018 7:47:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 407.6	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
31.8	**Tap T3** **Severity: None**	01:21	
135.8	**Tap T3** **Severity: None**	04:35	
327.7	**Tap T3** **Severity: None**	10:07	

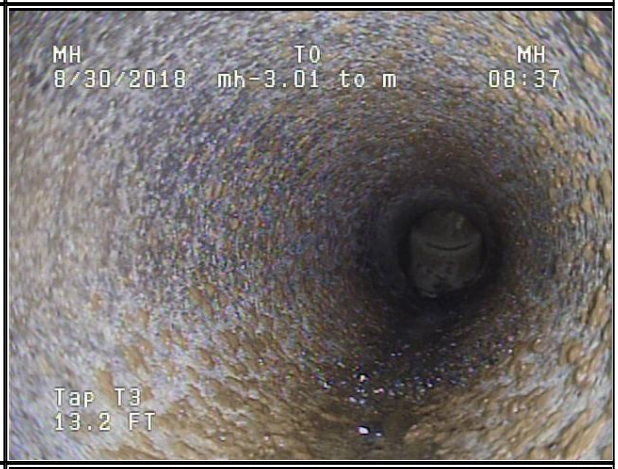
			 MH TO MH 8/30/2018 mh-3.02 to m 08:11 Tap T3 327.7 FT

Distance	Fault Observation	Time	Picture
407.6	Manhole Severity: None	12:47	

Created with the POSM report generator Back

Project Name: mh-3.01 to mh-2.01

Date: 8/30/2018 8:36:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 399	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
13.2	Tap T3 Severity: None	31	
244.5	Tap T3 Severity: None	06:57	
358.9	Tap T3 Severity: None	10:19	

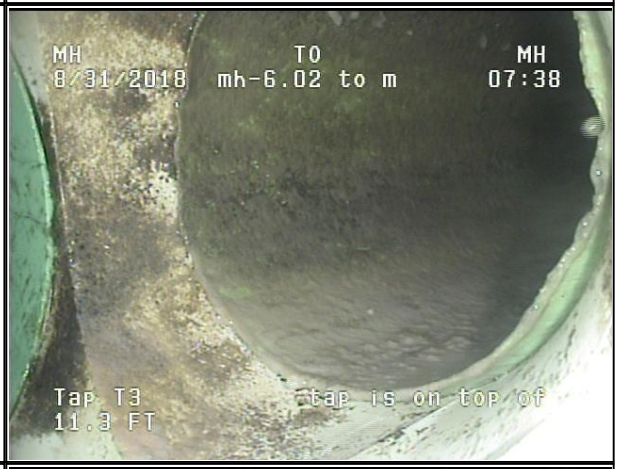
			 MH TO MH 8/30/2018 mh-3.01 to m 08:47 Tap T3 358.9 FT

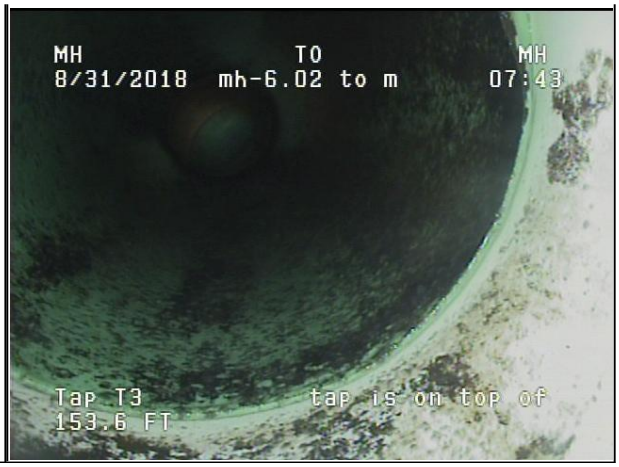
Distance	Fault Observation	Time	Picture
399.0	Tap T3 Severity: None	11:45	

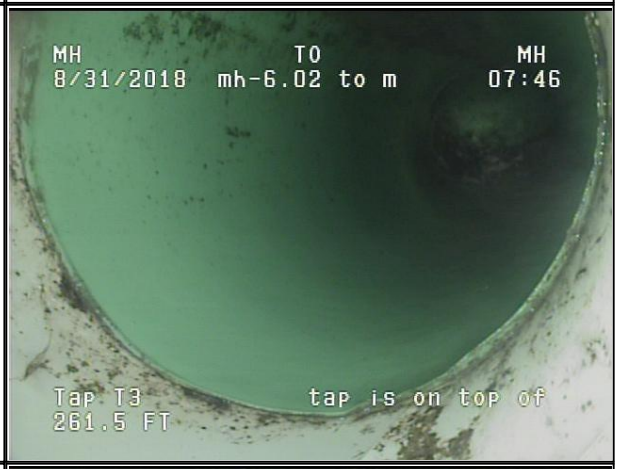
Created with the POSM report generator Back

Project Name: mh-6.02 to mh-6.03

Date: 8/31/2018 7:37:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 402.4	**End ID:**
Run Number:	**Direction:** Upstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
11.3	**Tap T3** **Severity: None** **Remarks: tap is on top of the line**	47	
76.7	**Tap T9** **Severity: None**	02:42	
153.6	**Tap T3** **Severity: None** **Remarks: tap is on top of the line**	05:09	

			 MH TO MH 8/31/2018 mh-6.02 to m 07:43 Tap T3 tap is on top of 153.6 FT

Distance	Fault Observation	Time	Picture
261.5	Tap T3 Severity: None Remarks: tap is on top of the line	08:19	
385.2	Tap T3 Severity: None Remarks: tap is on top of the line	11:57	
392.5	Tap T9 Severity: None	12:27	

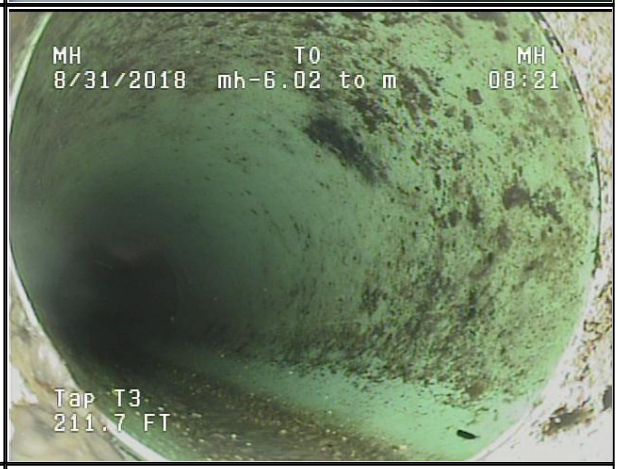
Distance	Fault Observation	Time	Picture
402.4	Manhole Severity: None	13:07	

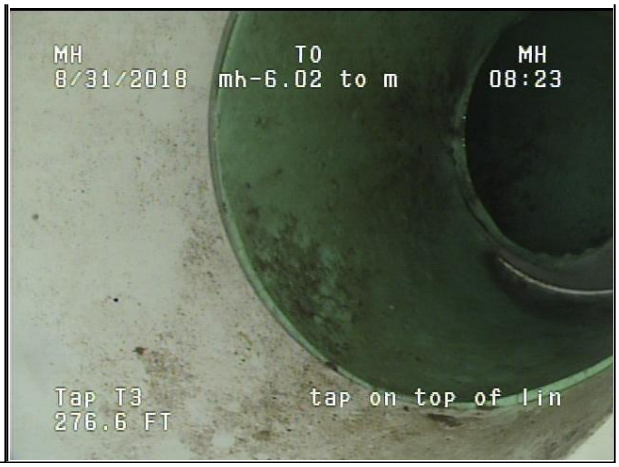
Created with the POSM report generator Back

POSM SOFTWARE

Project Name: mh-6.02 to mh-6.01

Date: 8/31/2018 8:15:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 405.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
109.8	**Tap T3** **Severity: None** **Remarks: tap on top of the line**	02:59	
211.7	**Tap T3** **Severity: None**	05:55	
276.6	**Tap T3** **Severity: None** **Remarks: tap on top of line**	07:57	

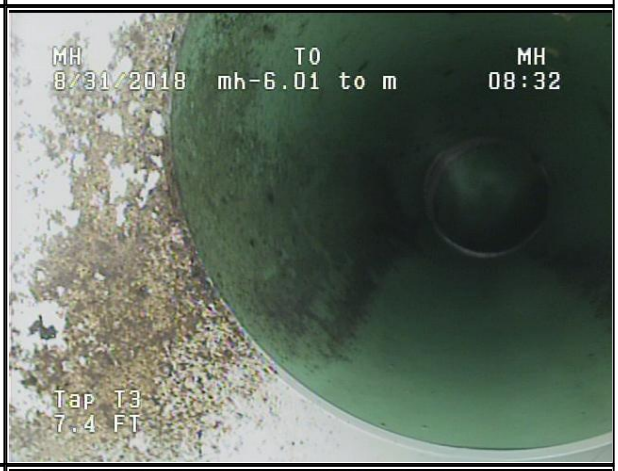
			 MH 8/31/2018 TO mh-6.02 to m MH 08:23 Tap T3 276.6 FT tap on top of lin

Distance	Fault Observation	Time	Picture
324.2	Tap T3 Severity: None	10:29	
405.4	Manhole Severity: None	12:53	

Created with the POSM report generator Back

Project Name: mh-6.01 to mh-5.03

Date: 8/31/2018 8:31:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 99.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** PVC

Distance	Fault Observation	Time	Picture
7.4	**Tap T3** **Severity: None**	22	
99.4	**Manhole** **Severity: None**	03:07	

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Project Name: mh-19.07 to mh-19.06

Date: 8/31/2018 9:56:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 208.9	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
99.8	**Tap T9** **Severity: None**	02:41	
106.9	**Tap T3** **Severity: None**	03:12	
208.9	**Manhole** **Severity: None**	6:10	

			

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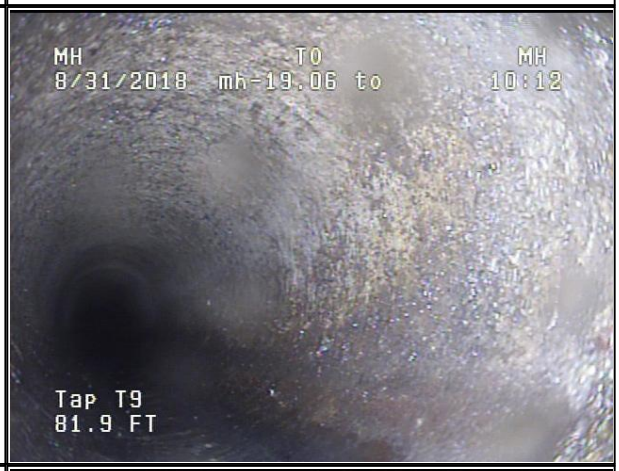
Project Name: mh-19.06 to mh-19.05

Date: 8/31/2018 10:09:00 AM	**Pipe ID:**
Asset Location:	**Start ID:**
Length Surveyed: 204.4	**End ID:**
Run Number:	**Direction:** Downstream
Pipe Size: 8 inch	**Pipe Type:** Concrete

Distance	Fault Observation	Time	Picture
81.9	**Tap T9** **Severity: None**	02:19	
204.4	**Manhole** **Severity: None**	05:54	

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APPENDIX F

COST ESTIMATES

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 3: Snob Hill LS Basin I/I and Pipe Improvements - Phase I; MH Replacements
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 7,000	$ 7,000
4.	Project Temporary Traffic Control	1	LS	$ 10,000	$ 10,000
5.	Trench Excavation Safety Systems	1	LS	$ 10,000	$ 10,000
6.	Sawcutting	320	LF	$ 5	$ 1,600
7.	Temporary Sewer Bypass Pumping	1	LS	$ 10,000	$ 10,000
8.	Remove and Dispose of Existing Asphalt Pavement	10	SY	$ 35	$ 350
9.	Foundation Gravel	10	TN	$ 35	$ 350
10.	Manhole 48 In. Diam.	5	EA	$ 5,000	$ 25,000
11.	Crushed Surfacing Base Course	20	TN	$ 45	$ 900
12.	HMA, CL 1/2-in PG 64-22	9	TN	$ 200	$ 1,800
13.	Temporary Erosion Control	1	LS	$ 1,000	$ 1,000
	Subtotal				$ 70,500
	Construction Contingencies (30%)				$ 21,150
	Subtotal				$ 91,650
	Sales Tax (8.5%)				$ 7,790
	Total Construction Cost (rounded)				**$ 99,440**
	Engineering Services (17%)				$ 16,905
	Construction Adminstration (12%)				$ 11,933
	Legal, County Administration, Permitting (5%)				$ 4,972
	Total Project Cost (rounded)				**$ 134,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 4: Area Drain Disconnection
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 3,000	$ 3,000
4.	Trench Excavation Safety Systems	1	LS	$ 5,000	$ 5,000
5.	Sawcutting	170	LF	$ 5	$ 850
6.	Remove and Dispose of Existing Asphalt Pavement	90	SY	$ 35	$ 3,150
7.	Bank Run Gravel for Trench Backfill	30	TN	$ 50	$ 1,500
8.	PVC Storm Sewer Pipe 8 In. Diam.	100	LF	$ 50	$ 5,000
9.	Catch Basin Type 1	1	EA	$ 2,500	$ 2,500
10.	Infiltration trench	1	EA	$ 5,000	$ 5,000
11.	Crushed Surfacing Base Course	20	TN	$ 45	$ 900
12.	HMA, CL 1/2-in PG 64-22	3	TN	$ 200	$ 600
13.	Temporary Erosion Control	1	LS	$ 500	$ 500
	Subtotal				$ 30,500
	Construction Contingencies (30%)				$ 9,150
	Subtotal				$ 39,650
	Sales Tax (8.5%)				$ 3,370
	Total Construction Cost (rounded)				**$ 43,020**
	Engineering Services (17%)				$ 7,313
	Construction Adminstration (12%)				$ 5,162
	Legal, County Administration, Permitting (5%)				$ 2,151
	Total Project Cost (rounded)				**$ 58,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 5: Middle Point LS Basin I/I and Pipe Improvements)
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 5,000	$ 5,000
4.	Trench Excavation Safety Systems	1	LS	$ 5,000	$ 5,000
5.	Sawcutting	170	LF	$ 5	$ 850
6.	Remove and Dispose of Existing Asphalt Pavement	90	SY	$ 35	$ 3,150
7.	Bank Run Gravel for Trench Backfill	40	TN	$ 50	$ 2,000
8.	PVC Sewer Pipe 8 In. Diam.	120	LF	$ 50	$ 6,000
9.	Manhole 48 In. Diam.	4	EA	$ 5,000	$ 20,000
10.	Crushed Surfacing Base Course	20	TN	$ 45	$ 900
11.	HMA, CL 1/2-in PG 64-22	14	TN	$ 200	$ 2,800
12.	Temporary Erosion Control	1	LS	$ 500	$ 500
	Subtotal				$ 48,700
	Construction Contingencies (30%)				$ 14,610
	Subtotal				$ 63,310
	Sales Tax (8.5%)				$ 5,381
	Total Construction Cost (rounded)				**$ 68,691**
	Engineering Services (17%)				$ 11,678
	Construction Adminstration (12%)				$ 8,243
	Legal, County Administration, Permitting (5%)				$ 3,435
	Total Project Cost (rounded)				**$ 93,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 6: Sekiu LS Basin I/I Improvements
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE		AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$	2,000
2.	SPCC Plan	1	LS	$ 500	$	500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 5,000	$	5,000
4.	Project Temporary Traffic Control	1	LS	$ 10,000	$	10,000
5.	Trench Excavation Safety Systems	1	LS	$ 10,000	$	10,000
6.	Sawcutting	200	LF	$ 5	$	1,000
7.	Temporary Sewer Bypass Pumping	1	LS	$ 6,000	$	6,000
8.	Remove and Dispose of Existing Asphalt Pavement	10	SY	$ 35	$	350
9.	Foundation Gravel	10	TN	$ 35	$	350
10.	Manhole 48 In. Diam.	3	EA	$ 5,000	$	15,000
11.	Crushed Surfacing Base Course	10	TN	$ 45	$	450
12.	HMA, CL 1/2-in PG 64-22	5	TN	$ 200	$	1,000
13.	Temporary Erosion Control	1	LS	$ 1,000	$	1,000
	Subtotal				$	52,650
	Construction Contingencies (30%)				$	15,795
	Subtotal				$	68,445
	Sales Tax (8.5%)				$	5,818
	Total Construction Cost (rounded)				**$**	**74,263**
	Engineering Services (17%)				$	14,853
	Construction Adminstration (12%)				$	8,912
	Legal, County Administration, Permitting (5%)				$	3,713
	Total Project Cost (rounded)				**$**	**102,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 7: Clallam Bay I/I Improvements
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 4,000	$ 4,000
4.	Project Temporary Traffic Control	1	LS	$ 10,000	$ 10,000
5.	Trench Excavation Safety Systems	1	LS	$ 10,000	$ 10,000
6.	Sawcutting	130	LF	$ 5	$ 650
7.	Temporary Sewer Bypass Pumping	1	LS	$ 4,000	$ 4,000
8.	Remove and Dispose of Existing Asphalt Pavement	10	SY	$ 35	$ 350
9.	Foundation Gravel	10	TN	$ 35	$ 350
10.	Manhole 48 In. Diam.	2	EA	$ 5,000	$ 10,000
11.	Crushed Surfacing Base Course	10	TN	$ 45	$ 450
12.	HMA, CL 1/2-in PG 64-22	4	TN	$ 200	$ 800
13.	Temporary Erosion Control	1	LS	$ 1,000	$ 1,000
	Subtotal				$ 44,100
	Construction Contingencies (30%)				$ 13,230
	Subtotal				$ 57,330
	Sales Tax (8.5%)				$ 4,873
	Total Construction Cost (rounded)				**$ 62,203**
	Engineering Services (17%)				$ 10,575
	Construction Adminstration (12%)				$ 7,464
	Legal, County Administration, Permitting (5%)				$ 3,110
	Total Project Cost (rounded)				**$ 84,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 8: Sekiu LS Pipe Replacement
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 78,000	$ 78,000
4.	Trench Excavation Safety Systems	1	LS	$ 20,000	$ 20,000
5.	Sawcutting	6,700	LF	$ 5	$ 33,500
6.	Remove and Dispose of Existing Asphalt Pavement	3,740	SY	$ 35	$ 130,900
7.	Bank Run Gravel for Trench Backfill	900	TN	$ 50	$ 45,000
8.	PVC Sewer Pipe 8 In. Diam.	3,340	LF	$ 50	$ 167,000
9.	6 In. Diam. Side Sewer Connection	34	EA	$ 600	$ 20,400
10.	Manhole 48 In. Diam.	23	EA	$ 5,000	$ 115,000
11.	Crushed Surfacing Base Course	790	TN	$ 45	$ 35,550
12.	HMA, CL 1/2-in PG 64-22	1032	TN	$ 200	$ 206,400
13.	Temporary Erosion Control	1	LS	$ 2,000	$ 2,000
	Subtotal				$ 856,250
	Construction Contingencies (30%)				$ 256,875
	Subtotal				$ 1,113,125
	Sales Tax (8.5%)				$ 94,616
	Total Construction Cost (rounded)				**$ 1,207,741**
	Engineering Services (17%)				$ 205,316
	Construction Adminstration (12%)				$ 144,929
	Legal, County Administration, Permitting (5%)				$ 60,387
	Total Project Cost (rounded)				**$ 1,619,000**

Note: Assumes open cut installation with the sewer main placed in the roadway and assumes a half width overlay.
ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 9: Sekiu Airport Rd. Pipe Replacement
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 38,000	$ 38,000
4.	Trench Excavation Safety Systems	1	LS	$ 20,000	$ 20,000
5.	Sawcutting	2,700	LF	$ 5	$ 13,500
6.	Remove and Dispose of Existing Asphalt Pavement	1,520	SY	$ 35	$ 53,200
7.	Bank Run Gravel for Trench Backfill	360	TN	$ 50	$ 18,000
8.	PVC Sewer Pipe 8 In. Diam.	1,340	LF	$ 50	$ 67,000
9.	6 In. Diam. Side Sewer Connection	10	EA	$ 600	$ 6,000
10.	Manhole 48 In. Diam.	20	EA	$ 5,000	$ 100,000
11.	Crushed Surfacing Base Course	320	TN	$ 45	$ 14,400
12.	HMA, CL 1/2-in PG 64-22	416	TN	$ 200	$ 83,200
13.	Temporary Erosion Control	1	LS	$ 2,000	$ 2,000
	Subtotal				$ 417,800
	Construction Contingencies (30%)				$ 125,340
	Subtotal				$ 543,140
	Sales Tax (8.5%)				$ 46,167
	Total Construction Cost (rounded)				**$ 589,307**
	Engineering Services (17%)				$ 100,182
	Construction Adminstration (12%)				$ 70,717
	Legal, County Administration, Permitting (5%)				$ 29,465
	Total Project Cost (rounded)				**$ 790,000**

Note: Assumes open cut installation with the sewer main placed in the roadway and assumes a half width overlay.

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 10: Snob Hill LS Basin I/Iand Pipe Improvements - Phase II; Pipe Replacement
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 118,000	$ 118,000
4.	Trench Excavation Safety Systems	1	LS	$ 5,000	$ 5,000
5.	Sawcutting	11,710	LF	$ 5	$ 58,550
6.	Remove and Dispose of Existing Asphalt Pavement	6,520	SY	$ 35	$ 228,200
7.	Bank Run Gravel for Trench Backfill	1,560	TN	$ 50	$ 78,000
8.	PVC Sewer Pipe 8 In. Diam.	5,845	LF	$ 50	$ 292,250
9.	6 In. Diam. Side Sewer Connection	46	EA	$ 600	$ 27,600
10.	Manhole 48 In. Diam.	13	EA	$ 5,000	$ 65,000
11.	Crushed Surfacing Base Course	1180	TN	$ 45	$ 53,100
12.	HMA, CL 1/2-in PG 64-22	1804	TN	$ 200	$ 360,800
13.	Temporary Erosion Control	1	LS	$ 2,000	$ 2,000
	Subtotal				$ 1,291,000
	Construction Contingencies (30%)				$ 387,300
	Subtotal				$ 1,678,300
	Sales Tax (8.5%)				$ 142,656
	Total Construction Cost (rounded)				**$ 1,820,956**
	Engineering Services (17%)				$ 309,562
	Construction Adminstration (12%)				$ 218,515
	Legal, County Administration, Permitting (5%)				$ 91,048
	Total Project Cost (rounded)				**$ 2,441,000**

Note: Assumes open cut installation with the sewer main placed in the roadway and assumes a half width overlay.
ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 11: West End LS Pipe Replacement
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 35,000	$ 35,000
4.	Trench Excavation Safety Systems	1	LS	$ 20,000	$ 20,000
5.	Sawcutting	3,180	LF	$ 5	$ 15,900
6.	Remove and Dispose of Existing Asphalt Pavement	1,780	SY	$ 35	$ 62,300
7.	Bank Run Gravel for Trench Backfill	430	TN	$ 50	$ 21,500
8.	PVC Sewer Pipe 8 In. Diam.	1,580	LF	$ 50	$ 79,000
9.	6 In. Diam. Side Sewer Connection	11	EA	$ 600	$ 6,600
10.	Manhole 48 In. Diam.	4	EA	$ 5,000	$ 20,000
11.	Crushed Surfacing Base Course	380	TN	$ 45	$ 17,100
12.	HMA, CL 1/2-in PG 64-22	490	TN	$ 200	$ 98,000
13.	Temporary Erosion Control	1	LS	$ 2,000	$ 2,000
	Subtotal				$ 379,900
	Construction Contingencies (30%)				$ 113,970
	Subtotal				$ 493,870
	Sales Tax (8.5%)				$ 41,979
	Total Construction Cost (rounded)				**$ 535,849**
	Engineering Services (17%)				$ 91,094
	Construction Adminstration (12%)				$ 64,302
	Legal, County Administration, Permitting (5%)				$ 26,792
	Total Project Cost (rounded)				**$ 719,000**

Note: Assumes open cut installation with the sewer main placed in the roadway and assumes a half width overlay.

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 12: Clallam Bay LS Pipe Replacement
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 292,000	$ 292,000
4.	Trench Excavation Safety Systems	1	LS	$ 20,000	$ 20,000
5.	Sawcutting	27,350	LF	$ 5	$ 136,750
6.	Remove and Dispose of Existing Asphalt Pavement	15,210	SY	$ 35	$ 532,350
7.	Bank Run Gravel for Trench Backfill	3,650	TN	$ 50	$ 182,500
8.	PVC Sewer Pipe 8 In. Diam.	13,665	LF	$ 50	$ 683,250
9.	6 In. Diam. Side Sewer Connection	99	EA	$ 600	$ 59,400
10.	Manhole 48 In. Diam.	63	EA	$ 5,000	$ 315,000
11.	Crushed Surfacing Base Course	3200	TN	$ 45	$ 144,000
12.	HMA, CL 1/2-in PG 64-22	4212	TN	$ 200	$ 842,400
13.	Temporary Erosion Control	1	LS	$ 2,000	$ 2,000
	Subtotal				$ 3,212,150
	Construction Contingencies (30%)				$ 963,645
	Subtotal				$ 4,175,795
	Sales Tax (8.5%)				$ 354,943
	Total Construction Cost (rounded)				**$ 4,530,738**
	Engineering Services (17%)				$ 770,225
	Construction Adminstration (12%)				$ 543,689
	Legal, County Administration, Permitting (5%)				$ 226,537
	Total Project Cost (rounded)				**$ 6,072,000**

Note: Assumes open cut installation with the sewer main placed in the roadway and assumes a half width overlay.
ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 13: Lighthouse LS Pipe Replacement
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1.	Unexpected Site Changes	1	LS	$ 2,000	$ 2,000
2.	SPCC Plan	1	LS	$ 500	$ 500
3.	Mobilization, Cleanup and Demobilization	1	LS	$ 81,000	$ 81,000
4.	Trench Excavation Safety Systems	1	LS	$ 20,000	$ 20,000
5.	Sawcutting	7,380	LF	$ 5	$ 36,900
6.	Remove and Dispose of Existing Asphalt Pavement	4,120	SY	$ 35	$ 144,200
7.	Bank Run Gravel for Trench Backfill	990	TN	$ 50	$ 49,500
8.	PVC Sewer Pipe 8 In. Diam.	3,680	LF	$ 50	$ 184,000
9.	6 In. Diam. Side Sewer Connection	58	EA	$ 600	$ 34,800
10.	Manhole 48 In. Diam.	14	EA	$ 5,000	$ 70,000
11.	Crushed Surfacing Base Course	870	TN	$ 45	$ 39,150
12.	HMA, CL 1/2-in PG 64-22	1137	TN	$ 200	$ 227,400
13.	Temporary Erosion Control	1	LS	$ 2,000	$ 2,000
	Subtotal				$ 891,450
	Construction Contingencies (30%)				$ 267,435
	Subtotal				$ 1,158,885
	Sales Tax (8.5%)				$ 98,505
	Total Construction Cost (rounded)				**$ 1,257,390**
	Engineering Services (17%)				$ 213,756
	Construction Adminstration (12%)				$ 150,887
	Legal, County Administration, Permitting (5%)				$ 62,870
	Total Project Cost (rounded)				**$ 1,685,000**

Note: Assumes open cut installation with the sewer main placed in the roadway and assumes a half width overlay.
ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 14: West End Lift Station Upgrades
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY			PRICE		AMOUNT
1	Mobilization/Demobilization	1	LS	$	45,000	$	45,000
2	Traffic Control	1	LS	$	20,000	$	20,000
3	Bypass Pumping	1	LS	$	20,000	$	20,000
4	Demolition	1	LS	$	10,000	$	10,000
5	Dewatering	1	LS	$	8,000	$	8,000
6	Valve Vault	1	LS	$	25,000	$	25,000
7	Piping & Valves	1	LS	$	32,000	$	32,000
8	Pumps	1	LS	$	50,000	$	50,000
9	Manhole Lid & Hatch	1	LS	$	18,000	$	18,000
10	Wetwell Rehabilitation	1	LS	$	12,000	$	12,000
11	Site Work/Restoration/Cleanup	1	LS	$	35,000	$	35,000
12	Trench Excavation Saftey Systems	1	LS	$	5,000	$	5,000
13	Unsuitable Excavation	10	CY	$	50	$	500
14	Painting	1	LS	$	5,000	$	5,000
15	Electrical	1	LS	$	75,000	$	75,000
16	Instrumentation & Controls	1	LS	$	140,000	$	140,000
	Subtotal					$	500,500
	Construction Contingencies (30%)					$	150,200
	Subtotal					$	650,700
	Sales Tax (8.5%)					$	55,400
	Total Estimated Construction Cost (rounded)					**$**	**706,100**
	Engineering Services (17%)					$	120,100
	Construction Adminstration (12%)					$	84,732
	Legal, County Administration, Permitting (5%)					$	35,305
	Total Estimated Project Cost (rounded)					**$**	**947,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 15: Middle Point Lift Station Upgrades
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY		PRICE	AMOUNT
1	Mobilization/Demobilization	1	LS	$ 45,000	$ 45,000
2	Traffic Control	1	LS	$ 2,000	$ 2,000
3	Bypass Pumping	1	LS	$ 20,000	$ 20,000
4	Demolition	1	LS	$ 10,000	$ 10,000
5	Dewatering	1	LS	$ 8,000	$ 8,000
6	Valve Vault	1	LS	$ 25,000	$ 25,000
7	Piping & Valves	1	LS	$ 32,000	$ 32,000
8	Pumps	1	LS	$ 65,000	$ 65,000
9	Manhole Lid & Hatch	1	LS	$ 18,000	$ 18,000
10	Wetwell Rehabilitation	1	LS	$ 12,000	$ 12,000
11	Site Work/Restoration/Cleanup	1	LS	$ 15,000	$ 15,000
12	Trench Excavation Saftey Systems	1	LS	$ 5,000	$ 5,000
13	Unsuitable Excavation	10	CY	$ 50	$ 500
14	Painting	1	LS	$ 5,000	$ 5,000
15	Electrical	1	LS	$ 75,000	$ 75,000
16	Instrumentation & Controls	1	LS	$ 140,000	$ 140,000
	Subtotal				$ 477,500
	Construction Contingencies (30%)				$ 143,250
	Subtotal				$ 620,750
	Sales Tax (8.5%)				$ 52,764
	Total Estimated Construction Cost (rounded)				**$ 673,600**
	Engineering Services (17%)				$ 114,512
	Construction Adminstration (12%)				$ 80,832
	Legal, County Administration, Permitting (5%)				$ 33,680
	Total Project Cost (rounded)				**$ 903,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 16: Snob Hill Lift Station Upgrades
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY			PRICE		AMOUNT
1	Mobilization/Demobilization	1	LS	$	45,000	$	45,000
2	Traffic Control	1	LS	$	20,000	$	20,000
3	Bypass Pumping	1	LS	$	20,000	$	20,000
4	Demolition	1	LS	$	20,000	$	20,000
5	Dewatering	1	LS	$	8,000	$	8,000
6	Valve Vault	1	LS	$	25,000	$	25,000
7	Piping & Valves	1	LS	$	40,000	$	40,000
8	Pumps	1	LS	$	65,000	$	65,000
9	Manhole Lid & Hatch	1	LS	$	18,000	$	18,000
10	Wetwell Rehabilitation & Modification	1	LS	$	12,000	$	12,000
11	Site Work/Restoration/Cleanup	1	LS	$	35,000	$	35,000
12	Trench Excavation Saftey Systems	1	LS	$	5,000	$	5,000
13	Unsuitable Excavation	10	CY	$	50	$	500
14	Painting	1	LS	$	5,000	$	5,000
15	Electrical	1	LS	$	75,000	$	75,000
16	Instrumentation & Controls	1	LS	$	140,000	$	140,000
	Subtotal					$	533,500
	Construction Contingencies (30%)					$	160,050
	Subtotal					$	693,550
	Sales Tax (8.5%)					$	58,952
	Total Estimated Construction Cost (rounded)					**$**	**752,600**
	Engineering Services (17%)					$	127,942
	Construction Adminstration (12%)					$	90,312
	Legal, County Administration, Permitting (5%)					$	37,630
	Total Project Cost (rounded)					**$**	**1,009,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 17: Sekiu Lift Station Upgrades
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY			PRICE		AMOUNT
1	Mobilization/Demobilization	1	LS	$	45,000	$	45,000
2	Bypass Pumping	1	LS	$	20,000	$	20,000
3	Demolition	1	LS	$	10,000	$	10,000
4	Dewatering	1	LS	$	8,000	$	8,000
5	Valve Vault	1	LS	$	25,000	$	25,000
6	Piping & Valves	1	LS	$	32,000	$	32,000
7	Pumps	1	LS	$	65,000	$	65,000
8	Manhole Lid & Hatch	1	LS	$	18,000	$	18,000
9	Wetwell Rehabilitation	1	LS	$	12,000	$	12,000
10	Site Work/Restoration/Cleanup	1	LS	$	5,000	$	5,000
11	Trench Excavation Saftey Systems	1	LS	$	5,000	$	5,000
12	Unsuitable Excavation	10	CY	$	50	$	500
13	Painting	1	LS	$	5,000	$	5,000
14	Electrical	1	LS	$	75,000	$	75,000
15	Instrumentation & Controls	1	LS	$	140,000	$	140,000
	Subtotal					$	465,500
	Construction Contingencies (30%)					$	139,650
	Subtotal					$	605,150
	Sales Tax (8.5%)					$	51,438
	Total Estimated Construction Cost (rounded)					**$**	**656,600**
	Engineering Services (17%)					$	111,622
	Construction Adminstration (12%)					$	78,792
	Legal, County Administration, Permitting (5%)					$	32,830
	Total Project Cost (rounded)					**$**	**880,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 18: Olson's Lift Lift Station Upgrades
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY			PRICE		AMOUNT
1	Mobilization/Demobilization	1	LS	$	45,000	$	45,000
2	Traffic Control	1	LS	$	10,000	$	10,000
3	Bypass Pumping	1	LS	$	20,000	$	20,000
4	Demolition	1	LS	$	10,000	$	10,000
5	Dewatering	1	LS	$	8,000	$	8,000
6	Valve Vault	1	LS	$	25,000	$	25,000
7	Piping & Valves	1	LS	$	32,000	$	32,000
8	Pumps	1	LS	$	40,000	$	40,000
9	New Flat Manhole Lid & Hatch	1	LS	$	18,000	$	18,000
10	Wetwell Rehabilitation	1	LS	$	12,000	$	12,000
11	Site Work/Restoration/Cleanup	1	LS	$	20,000	$	20,000
12	Trench Excavation Saftey Systems	1	LS	$	5,000	$	5,000
13	Unsuitable Excavation	10	CY	$	50	$	500
14	Painting	1	LS	$	5,000	$	5,000
15	Electrical	1	LS	$	75,000	$	75,000
16	Instrumentation & Controls	1	LS	$	140,000	$	140,000
	Subtotal					$	465,500
	Construction Contingencies (30%)					$	139,700
	Subtotal					$	605,200
	Sales Tax (8.5%)					$	51,500
	Total Estimated Construction Cost (rounded)					**$**	**656,700**
	Engineering Services (17%)					$	111,700
	Construction Adminstration (12%)					$	78,804
	Legal, County Administration, Permitting (5%)					$	32,835
	Total Estimated Project Cost (rounded)					**$**	**881,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 19: Lighthouse Lift Station Upgrades
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY			PRICE		AMOUNT
1	Mobilization/Demobilization	1	LS	$	45,000	$	45,000
2	Traffic Control	1	LS	$	22,000	$	22,000
3	Bypass Pumping	1	LS	$	20,000	$	20,000
4	Demolition	1	LS	$	10,000	$	10,000
5	Dewatering	1	LS	$	8,000	$	8,000
6	Valve Vault	1	LS	$	25,000	$	25,000
7	Piping & Valves	1	LS	$	32,000	$	32,000
8	Pumps	1	LS	$	55,000	$	55,000
9	Manhole Lid & Hatch	1	LS	$	18,000	$	18,000
10	Wetwell Rehabilitation	1	LS	$	12,000	$	12,000
11	Site Work/Restoration/Cleanup	1	LS	$	35,000	$	35,000
12	Trench Excavation Saftey Systems	1	LS	$	5,000	$	5,000
13	Unsuitable Excavation	10	CY	$	50	$	500
14	Painting	1	LS	$	5,000	$	5,000
15	Electrical	1	LS	$	75,000	$	75,000
16	Instrumentation & Controls	1	LS	$	140,000	$	140,000
	Subtotal					$	507,500
	Construction Contingencies (30%)					$	152,250
	Subtotal					$	659,750
	Sales Tax (8.5%)					$	56,079
	Total Estimated Construction Cost (rounded)					**$**	**715,900**
	Engineering Services (17%)					$	121,703
	Construction Adminstration (12%)					$	85,908
	Legal, County Administration, Permitting (5%)					$	35,795
	Total Project Cost (rounded)					**$**	**960,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY
CLALLAM BAY / SEKIU GENERAL SWER / WASTEWATER FACILILTIES PLAN
PLANNING LEVEL COST ESTIMATE
CIP No. 20: Clallam Bay Lift Station Upgrades
October 2018
G&O# 18486

NO.	DESCRIPTION	QUANTITY			PRICE		AMOUNT
1	Mobilization/Demobilization	1	LS	$	45,000	$	45,000
2	Traffic Control	1	LS	$	20,000	$	20,000
3	Bypass Pumping	1	LS	$	20,000	$	20,000
4	Demolition	1	LS	$	20,000	$	20,000
5	Dewatering	1	LS	$	8,000	$	8,000
6	Valve Vault	1	LS	$	25,000	$	25,000
7	Piping & Valves	1	LS	$	40,000	$	40,000
8	Pumps	1	LS	$	70,000	$	70,000
9	Manhole Lid & Hatch	1	LS	$	18,000	$	18,000
10	Wetwell Rehabilitation & Modification	1	LS	$	12,000	$	12,000
11	Site Work/Restoration/Cleanup	1	LS	$	35,000	$	35,000
12	Trench Excavation Saftey Systems	1	LS	$	5,000	$	5,000
13	Unsuitable Excavation	10	CY	$	50	$	500
14	Painting	1	LS	$	5,000	$	5,000
15	Electrical	1	LS	$	75,000	$	75,000
16	Instrumentation & Controls	1	LS	$	140,000	$	140,000
	Subtotal					$	538,500
	Construction Contingencies (30%)					$	161,550
	Subtotal					$	700,050
	Sales Tax (8.5%)					$	59,504
	Total Estimated Construction Cost (rounded)					**$**	**759,600**
	Engineering Services (17%)					$	129,132
	Construction Adminstration (12%)					$	91,152
	Legal, County Administration, Permitting (5%)					$	37,980
	Total Project Cost (rounded)					**$**	**1,018,000**

ENR Construction Cost Index (Seattle): 11187- October 2018

CLALLAM COUNTY

Alternative 1: Modification/Expansion of Both Facilities

OPINION OF PROBABLE COST

October - 2018

CAPITAL COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE, INSTALLED	AMOUNT
1	Mobilization/Demobilization	1	LS	$ 790,000	$ 790,000
2	Temporary Bypass Pumping & Treatment	1	LS	$ 250,000	$ 250,000
3	Flood Hazard Mitigation & Impact Study	1	LS	$ 30,000	$ 30,000
4	Clallam Bay Flood Proofing & Site Work	1	LS	$ 300,000	$ 300,000
5	Influent & Effluent Flow Meters	4	EA	$ 11,000	$ 44,000
6	Headworks	2	LS	$ 600,000	$ 1,200,000
7	Rehab Primary Clarifiers	1	LS	$ 192,000	$ 192,000
8	Primary Sludge Pumps	2	EA	$ 32,000	$ 64,000
9	Primary Scum Pump	2	EA	$ 20,000	$ 40,000
10	Primary Scum Pit	2	LS	$ 6,000	$ 12,000
11	RBC Splitter Box	2	LS	$ 8,000	$ 16,000
12	Rehab RBCs	1	LS	$ 445,000	$ 445,000
13	Secondary Clarifier Splitter Box	2	LS	$ 28,000	$ 56,000
14	Rehab Clallam Bay Secondary Clarifier	1	LS	$ 192,000	$ 192,000
15	CB Secondary Clarifier (Mech., Conc. & Erthwk)	1	LS	$ 290,000	$ 290,000
16	SK Secondary Clarifiers (Mech., Conc. & Erthwrk)	1	LS	$ 590,000	$ 590,000
17	Secondary Scum Pump	2	EA	$ 7,000	$ 14,000
18	Secondary Scum Pit	2	LS	$ 6,000	$ 12,000
19	UV System - Sekiu	1	LS	$ 119,000	$ 119,000
20	UV System Mods - Clallam Bay	1	LS	$ 69,000	$ 69,000
21	UV Building - Clallam Bay	1	LS	$ 84,000	$ 84,000
22	Non-potable Water System	2	LS	$ 144,000	$ 288,000
23	New Equipment Building	1	LS	$ 113,000	$ 113,000
24	Sludge Transfer Pump	2	EA	$ 20,000	$ 40,000
25	Blowers	4	EA	$ 60,000	$ 240,000
26	New Operations Building at Clallam Bay	1	LS	$ 667,000	$ 667,000
27	Sekiu Operations Building Modifications	1	LS	$ 100,000	$ 100,000
28	Plant Drain Pump Station	2	LS	$ 90,000	$ 180,000
29	Sekiu Effluent Pumps & Effluent Vault Mod	1	LS	$ 133,000	$ 133,000
30	Effluent Filtration	1	LS	$ 250,000	$ 250,000
31	Outfall Cathodic Protection	2	LS	$ 25,000	$ 50,000
32	Painting	1	LS	$ 100,000	$ 100,000
33	Site Piping	1	LS	$ 1,190,000	$ 1,190,000
34	Electrical & Instrumentation	1	LS	$ 1,790,000	$ 1,790,000
Subtotal					$ 9,950,000
Contingency (30%)					$ 2,985,000
Subtotal					$ 12,935,000
Tax (8.5%)					$ 1,100,000
Total Estimated Construction Cost					$ 14,035,000
Engineering Services (20%)					$ 2,807,000
Construction Administration (12%)					$ 1,685,000
Legal, County Administration, Permitting (7%)					$ 983,000
Total Estimated Project Cost					$ 19,510,000

ANNUAL O&M COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE	AMOUNT
1	Labor	4.0	FTE	$ 100,000	$ 400,000
2	Electricity	300,000	kWh	$ 0.0727	$ 22,000
3	Maintenance and Repair	9,950,000	Constr. Cost	1%	$ 100,000
4	Misc. (Lab, Chemicals, etc.)	1	LS	$ 20,000	$ 20,000
5	Administration and Permitting	1	LS	$ 10,000	$ 10,000
6	Sludge Hauling and Disposal	1	LS	$ 25,000	$ 25,000
Total Operating Cost / Year					$ 577,000
Annaul O&M (2018-2038)					$ 11,540,000
20-Year Life Cycle Cost					$ 31,050,000

CLALLAM COUNTY

Alternative 2A: Clallam Bay Activated RBC Facility

OPINION OF PROBABLE COST

October - 2018

CAPITAL COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE, INSTALLED	AMOUNT
1	Mobilization/Demobilization	1	LS	$ 870,000	$ 870,000
2	Temporary Bypass Pumping & Treatment	1	LS	$ 250,000	$ 250,000
3	Flood Hazard Mitigation & Impact Study	1	LS	$ 30,000	$ 30,000
4	Clallam Bay Flood Proofing	1	LS	$ 225,000	$ 225,000
5	New Sekiu Influent Pump Station & Forcemain	1	LS	$ 4,150,000	$ 4,150,000
6	Influent & Effluent Flow Meters	2	EA	$ 11,000	$ 22,000
7	Headworks	1	LS	$ 610,000	$ 610,000
8	Rehab Primary Clarifier	1	LS	$ 192,000	$ 192,000
9	Primary Clarifier Flow Diversion Structure	1	LS	$ 25,000	$ 25,000
10	Primary Sludge Pumps	1	EA	$ 32,000	$ 32,000
11	Primary Scum Pump	1	EA	$ 20,000	$ 20,000
12	Primary Scum Pit	1	LS	$ 6,000	$ 6,000
13	RBC Splitter Box	1	LS	$ 8,000	$ 8,000
14	Rehab RBCs	1	LS	$ 102,000	$ 102,000
15	Contact/Stabilization Basin	1	LS	$ 169,000	$ 169,000
16	Blowers	4	EA	$ 41,000	$ 164,000
17	Secondary Clarifier Splitter Box	1	LS	$ 17,000	$ 17,000
18	CB Secondary Clarifiers (Mech., Conc. & Erthwrk)	1	LS	$ 590,000	$ 590,000
19	Secondary Scum Pump	1	EA	$ 7,000	$ 7,000
20	Primary Scum Pit	1	LS	$ 6,000	$ 6,000
21	UV System	1	LS	$ 123,000	$ 123,000
22	UV Building	1	LS	$ 115,000	$ 115,000
23	Non-potable Water System	1	LS	$ 120,000	$ 120,000
24	New Equipment Building	1	LS	$ 113,000	$ 113,000
25	Sludge Transfer Pump	1	EA	$ 20,000	$ 20,000
26	New Operations Building	1	LS	$ 667,000	$ 667,000
27	Plant Drain Pump Station	1	LS	$ 90,000	$ 90,000
28	Outfall Cathodic Protection	2	LS	$ 25,000	$ 50,000
29	Effluent Pumps & Effluent Vault Mod	1	LS	$ 125,000	$ 125,000
30	Painting	1	LS	$ 75,000	$ 75,000
31	Site Piping	1	LS	$ 880,000	$ 880,000
32	Electrical & Instrumentation	1	LS	$ 1,320,000	$ 1,320,000
Subtotal					$ 11,193,000
Contingency (30%)					$ 3,358,000
Subtotal					$ 14,551,000
Tax (8.5%)					$ 1,237,000
Total Estimated Construction Cost					$ 15,788,000
Engineering Services (20%)					$ 3,158,000
Construction Administration (12%)					$ 1,895,000
Legal, County Administration, Permitting (7%)					$ 1,106,000
Total Estimated Project Cost					$ 21,947,000

ENR Construction Cost Index (Seattle): 11187-October 2018

CLALLAM COUNTY

Alternative 2B: Clallam Bay Conventional Activated Sludge

OPINION OF PROBABLE COST

October - 2018

CAPITAL COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE, INSTALLED	AMOUNT
1	Mobilization/Demobilization	1	LS	$ 1,020,000	$ 1,020,000
	Temporaty Bypass Pumping & Treatment	1	LS	$ 250,000	$ 250,000
2	Clallam Bay Flood Proofing	1	LS	$ 225,000	$ 225,000
3	Sekiu Influent Pump Station & Forcemain	1	LS	$ 4,150,000	$ 4,150,000
4	Influent & Effluent Flow Meters	2	EA	$ 11,000	$ 22,000
5	Headworks	1	LS	$ 610,000	$ 610,000
6	Blowers	4	EA	$ 41,000	$ 164,000
7	Aeration Basins (Mech., Concrete & Earthwork)	1	EA	$ 1,696,000	$ 1,696,000
8	Secondary Clarifier Splitter Box	1	LS	$ 17,000	$ 17,000
9	CB Secondary Clarifiers (Mech.,Concrete & Earthw	1	LS	$ 590,000	$ 590,000
10	Secondary Scum Pump	1	EA	$ 7,000	$ 7,000
11	Secondary Scum Pit	1	LS	$ 6,000	$ 6,000
12	UV System	1	LS	$ 123,000	$ 123,000
13	UV Building	1	LS	$ 115,000	$ 115,000
14	Non-potable Water System	1	LS	$ 120,000	$ 120,000
15	New Equipment Building	1	LS	$ 113,000	$ 113,000
16	Sludge Transfer Pump	1	EA	$ 20,000	$ 20,000
17	New Operations Building	1	LS	$ 667,000	$ 667,000
18	Plant Drain Pump Station	1	LS	$ 90,000	$ 90,000
19	Outfall Cathodic Protection	2	LS	$ 25,000	$ 50,000
20	Effluent Pumps & Effluent Vault Mod	1	LS	$ 125,000	$ 125,000
21	Painting	1	LS	$ 90,000	$ 90,000
22	Site Piping	1	LS	$ 1,100,000	$ 1,100,000
23	Electrical & Instrumentation	1	LS	$ 1,650,000	$ 1,650,000
Subtotal					$ 13,020,000
Contingency (30%)					$ 3,906,000
Subtotal					$ 16,926,000
Tax (8.5%)					$ 1,439,000
Total Estimated Construction Cost					$ 18,365,000
Engineering Services (20%)					$ 3,673,000
Construction Administration (12%)					$ 2,204,000
Legal, County Administration, Permitting (7%)					$ 1,286,000
Total Estimated Project Cost					$ 25,528,000

ENR Construction Cost Index (Seattle): 11187-October 2018

CLALLAM COUNTY

Alternative 2C: Clallam Bay Oxidation Ditch

OPINION OF PROBABLE COST

October - 2018

CAPITAL COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE, INSTALLED	AMOUNT
1	Mobilization/Demobilization	1	LS	$ 1,000,000	$ 1,000,000
	Temporaty Bypass Pumping & Treatment	1	LS	$ 250,000	$ 250,000
2	Clallam Bay Flood Proofing	1	LS	$ 225,000	$ 225,000
3	Sekiu Influent Pump Station & Forcemain	1	LS	$ 4,150,000	$ 4,150,000
4	Influent & Effluent Flow Meters	2	EA	$ 11,000	$ 22,000
5	Headworks	1	LS	$ 610,000	$ 610,000
6	Blowers	4	EA	$ 41,000	$ 164,000
7	Oxidation Ditch (Mech., Concrete & Earthwork)	1	EA	$ 1,129,000	$ 1,129,000
8	Secondary Clarifier Splitter Box	1	LS	$ 17,000	$ 17,000
9	Rehab Secondary Clarifier	1	LS	$ 165,000	$ 165,000
10	CB Secondary Clarifiers (Mech.,Conc. & Erthwrk)	1	LS	$ 590,000	$ 590,000
11	Secondary Scum Pump	1	EA	$ 7,000	$ 7,000
12	Secondary Scum Pit	1	LS	$ 6,000	$ 6,000
13	UV System	1	LS	$ 123,000	$ 123,000
14	UV Building	1	LS	$ 115,000	$ 115,000
15	Non-potable Water System	1	LS	$ 120,000	$ 120,000
16	New Equipment Building	1	LS	$ 113,000	$ 113,000
17	Sludge Transfer Pump	1	EA	$ 20,000	$ 20,000
18	New Operations Building	1	LS	$ 667,000	$ 667,000
19	Plant Drain Pump Station	1	LS	$ 90,000	$ 90,000
20	Outfall Cathodic Protection	2	LS	$ 25,000	$ 50,000
21	Effluent Pumps & Effluent Vault Mod	1	LS	$ 125,000	$ 125,000
22	Painting	1	LS	$ 90,000	$ 90,000
23	Site Piping	1	LS	$ 1,030,000	$ 1,030,000
24	Electrical & Instrumentation	1	LS	$ 1,550,000	$ 1,550,000
Subtotal					$ 12,428,000
Contingency (30%)					$ 3,729,000
Subtotal					$ 16,157,000
Tax (8.5%)					$ 1,374,000
Total Estimated Construction Cost					$ 17,531,000
Engineering Services (20%)					$ 3,507,000
Construction Administration (12%)					$ 2,104,000
Legal, County Administration, Permitting (7%)					$ 1,228,000
Total Estimated Project Cost					$ 24,370,000

ENR Construction Cost Index (Seattle): 11187-October 2018

CLALLAM COUNTY

Alternative 3A: New Upland WWTP Conventional Activated Sludge

OPINION OF PROBABLE COST

October - 2018

CAPITAL COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE, INSTALLED	AMOUNT
1	Mobilization/Demobilization	1	LS	$ 1,250,000	$ 1,250,000
2	Land Development	1	LS	$ 150,000	$ 150,000
3	New Sekiu LS & Forcemain	1	LS	$ 1,530,000	$ 1,530,000
4	New Clallam Bay LS & Forcemain	1	LS	$ 4,110,000	$ 4,110,000
5	Influent & Effluent Flow Meters	2	EA	$ 11,000	$ 22,000
6	Headworks	1	LS	$ 610,000	$ 610,000
7	Blowers	4	EA	$ 41,000	$ 164,000
8	Aeration Basins (Mech., Conc & Earthwork)	1	EA	$ 1,696,000	$ 1,696,000
9	Secondary Clarifier Splitter Box	1	LS	$ 17,000	$ 17,000
10	Secondary Clarifiers (Mech.,Conc & Erthwrk)	1	LS	$ 590,000	$ 590,000
11	Secondary Scum Pump	1	EA	$ 7,000	$ 7,000
12	Secondary Scum Pit	1	LS	$ 6,000	$ 6,000
13	UV System	1	LS	$ 112,000	$ 112,000
14	UV Building	1	LS	$ 125,000	$ 125,000
15	Non-potable Water System	1	LS	$ 120,000	$ 120,000
16	Equipment Building	1	LS	$ 113,000	$ 113,000
17	Sludge Holding Tanks	1	EA	$ 214,000	$ 214,000
18	New Operations Building	1	LS	$ 667,000	$ 667,000
19	Plant Drain Pump Station	1	LS	$ 90,000	$ 90,000
20	Outfall Cathodic Protection	1	LS	$ 25,000	$ 25,000
21	New Effluent Line to Old Sekiu WWTP Outfall	1	LS	$ 105,000	$ 105,000
22	Sekiu Effluent Pumps & Effluent Vault Mod	1	LS	$ 133,000	$ 133,000
23	Site Work (Fine grading, paving, landscaping)	1	LS	$ 125,000	$ 125,000
24	Painting	1	LS	$ 102,000	$ 102,000
25	Site Piping	1	LS	$ 1,300,000	$ 1,300,000
26	Electrical & Instrumentation	1	LS	$ 1,920,000	$ 1,920,000
Subtotal					$ 15,303,000
Contingency (30%)					$ 4,591,000
Subtotal					$ 19,894,000
Tax (8.5%)					$ 1,691,000
Total Estimated Construction Cost					$ 21,585,000
Engineering Services (17%)					$ 3,670,000
Construction Administration (12%)					$ 2,591,000
Legal, County Administration, Permitting (7%)					$ 1,511,000
Total Estimated Project Cost					$ 29,357,000

ANNUAL O&M COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE	AMOUNT
1	Labor	3.0	FTE	$ 100,000	$ 300,000
2	Electricity	450,000	kWh	$ 0.0727	$ 33,000
3	Maintenance and Repair	15,303,000	Constr. Cost	1%	$ 154,000
4	Misc. (Lab, Chemicals, etc.)	1	LS	$ 20,000	$ 20,000
5	Administration and Permitting	1	LS	$ 10,000	$ 10,000
6	Sludge Hauling and Disposal	1	LS	$ 22,000	$ 22,000
Total Operating Cost / Year					$ 539,000
Annaul O&M (2018-2038)					$ 10,780,000
20-Year Life Cycle Cost					$ 40,137,000

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CLALLAM COUNTY

Alternative 3B: New Upland WWTP Oxidation Ditch

OPINION OF PROBABLE COST

October - 2018

CAPITAL COSTS

NO.	ITEM	QTY	UNIT	NIT PRICE, INSTALLE	AMOUNT
1	Mobilization/Demobilization	1	LS	$ 1,130,000	$ 1,130,000
2	Land Development	1	LS	$ 150,000	$ 150,000
3	New Sekiu LS & Forcemain	1	LS	$ 1,530,000	$ 1,530,000
4	New Clallam Bay LS & Forcemain	1	LS	$ 4,110,000	$ 4,110,000
5	Influent & Effluent Flow Meters	2	EA	$ 11,000	$ 22,000
6	Headworks	1	LS	$ 610,000	$ 610,000
7	Blowers	3	EA	$ 41,000	$ 123,000
8	Oxidation Ditch (Mech, Concrete & Earthwork)	1	EA	$ 1,129,000	$ 1,129,000
9	Secondary Clarifier Splitter Box	1	LS	$ 17,000	$ 17,000
10	Secondary Clarifiers (Mech.,Conc. & Earthwork)	1	LS	$ 590,000	$ 590,000
11	Secondary Scum Pump	1	EA	$ 7,000	$ 7,000
12	Primary Scum Pit	1	LS	$ 5,300	$ 6,000
13	UV System	1	LS	$ 112,000	$ 112,000
14	UV Building	1	LS	$ 125,000	$ 125,000
15	Non-potable Water System	1	LS	$ 120,000	$ 120,000
16	Equipment Building	1	LS	$ 113,000	$ 113,000
17	Sludge Holding Tanks	1	EA	$ 214,000	$ 214,000
18	New Operations Building	1	LS	$ 667,000	$ 667,000
19	Plant Drain Pump Station	1	LS	$ 90,000	$ 90,000
20	Outfall Cathodic Protection	1	LS	$ 25,000	$ 25,000
21	New Effluent Line to Old Sekiu WWTP Outfall	1	LS	$ 105,000	$ 105,000
22	Sekiu Effluent Pumps & Effluent Vault Mod	1	LS	$ 133,000	$ 133,000
23	Site Work (Fine grading, paving, landscaping)	1	LS	$ 125,000	$ 125,000
24	Painting	1	LS	$ 95,000	$ 95,000
25	Site Piping	1	LS	$ 1,150,000	$ 1,150,000
26	Electrical & Instrumentation	1	LS	$ 1,750,000	$ 1,750,000
Subtotal					$ 14,248,000
Contingency (30%)					$ 4,275,000
Subtotal					$ 18,523,000
Tax (8.5%)					$ 1,575,000
Total Estimated Construction Cost					$ 20,098,000
Engineering Services (17%)					$ 3,417,000
Construction Administration (12%)					$ 2,412,000
Legal, County Administration, Permitting (7%)					$ 1,407,000
Total Estimated Project Cost					$ 27,334,000

ANNUAL O&M COSTS

NO.	ITEM	QTY	UNIT	UNIT PRICE	AMOUNT
1	Labor	3.0	FTE	$ 100,000	$ 300,000
2	Electricity	450,000	kWh	$ 0.0727	$ 33,000
3	Maintenance and Repair	14,248,000	Constr. Cost	1%	$ 143,000
4	Misc. (Lab, Chemicals, etc.)	1	LS	$ 20,000	$ 20,000
5	Administration and Permitting	1	LS	$ 10,000	$ 10,000
6	Sludge Hauling and Disposal	1	LS	$ 22,000	$ 22,000
Total Operating Cost / Year					$ 528,000
Annaul O&M (2018-2038)					$ 10,560,000
20-Year Life Cycle Cost					$ 37,894,000

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