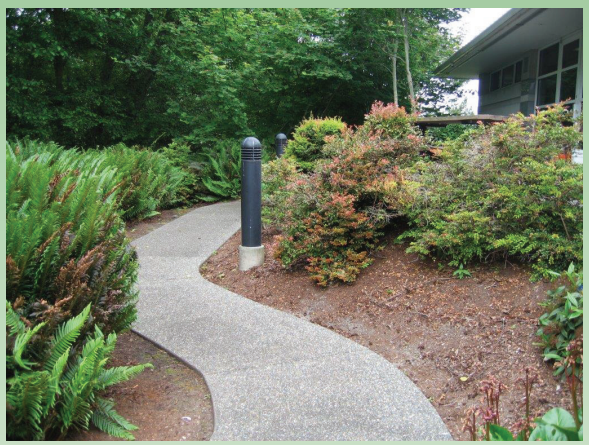
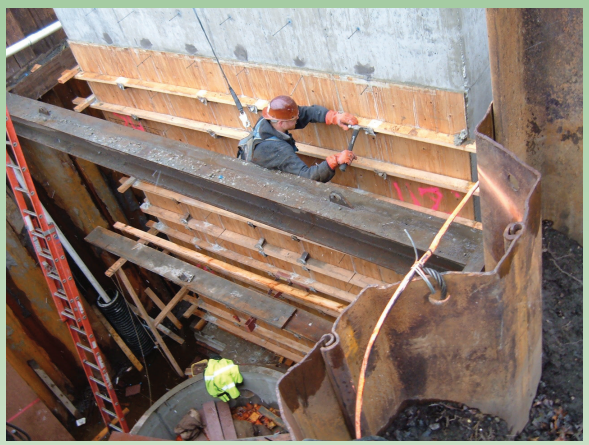
Comprehensive Sewer Plan

City of
Edmonds
Washington





August 2013

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City of Edmonds

Comprehensive Sewer Plan

August 2013

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City of Edmonds

COMPREHENSIVE SEWER PLAN

August 2013

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City of Edmonds
Comprehensive Sewer Plan

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GLOSSARY

ABBREVIATIONS

APPENDICES
A. I & I Study
B. Model Calibration and Documentation
C. Not Used
D. SEPA Checklist and Determination of Significance
E. Cost Estimates for CIP
F. Known Collection System Deficiencies
G. Sewer Service Agreements
H. Pre-Treatment Policy
I. City's Development Guidelines and Standards for Developer Extensions

J. Agency review Comments and Responses
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GLOSSARY

100-year flood: The magnitude of a flood likely to occur, on average, once every 100 years.
Average Wet Weather Flow: Wastewater flow during period when groundwater table is high and precipitation is at its peak, generally the four wet weather months, from November to February.
Class 1 Stream: A perennial or intermittent stream that is used by threatened or endangered fish or larger numbers of other fish, or that is used as a direct source of water for domestic use.
Force Main: Pressurized discharge pipe from a lift station.
Infiltration: Groundwater entering the sewage collection system through defective joints, pipes, and improperly sealed manholes.
Inflow: Sewage flows resulting from stormwater runoff entering the sewage collection system, typically through manhole covers, roof leaders, and area drains connected directly to sewer, cross connections from storm drains and catch basins, and direct flows into broken sewers.
Maximum Monthly Flow: Average daily flow during the highest flow month of the year.
Mini-Basin: Drainage catchment areas within the North Creek, Swamp Creek, Picnic Point, Everett or Little Bear Creek Drainage Basins. Mini-basins followed the King County delineation to the extent of the County's effort to define the mini-basins.
National Flood Insurance Program: Federally funded program providing flood insurance to property owners in flood plains provided the local government meets certain criteria for management of flood damage risk.
Orange Book: *Criteria for Sewage Works Design,* published by the Washington State Department of Ecology
Peak Hourly Flow: Wastewater flow during the highest flow hour.
Sensitive Area: Area in which development potential is limited by environmental factors such as steep slopes, wetlands, and valuable natural habitat.
Sewer Lateral: A sewer with no other common sewers discharging into it.
Sewer Submain: A sewer that receives flow from one or more lateral sewers.
Sewer Main or Trunk: A sewer that receives flow from one or more submains.
Sewer Interceptor: A sewer that receives flow from a number of main or trunk sewers, force mains, etc.
Urban Growth Area: Area in which urban development must be contained, as stipulated by the Growth Management Act.

ABBREVIATIONS

AAF	Average Annual Flow
ADWF	Average Dry Weather Flow
AWWD	Alderwood Water and Wastewater District
AWWF	Average Wet Weather Flow
BOD	Biological Oxygen Demand
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
CWA	Clean Water Act
DOH	Washington State Department of Health
DOE	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERU	Equivalent Residential Unit
ESA	Endangered Species Act
FEMA	Federal Emergency Management Act
FOG	Fats, Oils and Greases
FPS	Feet per second
FWPCA	Federal Water Pollution Control Act (“The Clean Water Act”)
GMA	Growth Management Act
GPCD	Gallons per capita per day
GPAD	Gallons per acre per day
GPD	Gallons per day
HPA	Hydraulic Project Approval
I/I	Infiltration and Inflow
JARPA	Joint Aquatic Resources Permit Application
KCDNR	King County Department of Natural Resources
MMF	Maximum Month Flow
MBR	Membrane Bioreactor
MGD	Million Gallons per Day
mg/l	milligrams per liter
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
OCD	Washington State Office of Community Development
OFM	Washington State Office of Financial Management
ppd	Pounds per day
PVC	Polyvinyl Chloride
PWWF	Peak Wet Weather Flow
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SRF	State Revolving Fund
TSS	Total Suspended Solids
UGA	Urban Growth Area
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WWTP	Wastewater Treatment Plant

CHAPTER I – EXECUTIVE SUMMARY

1.1 INTRODUCTION

The City of Edmonds' (City) Comprehensive Sewer Plan (the Plan) reviews the City's current sewage capacities and looks at the impact of projected growth on the City's sewage collection and conveyance system.

The analysis of the Edmonds Wastewater Treatment Plant (WWTP) was also done evaluating the existing plant under current and anticipated loadings and also evaluated the future of the plant when subjected to tightening effluent limits expected to be imposed on Puget Sound dischargers.

The Plan identifies future facilities required to accommodate both existing and future wastewater collection, conveyance and treatment needs as the City's population grows within the service area limits for the years 2019, 2033, and buildout conditions.

The plan was prepared in conformance with Washington Administrative Code (WAC) 173-240-050.

1.2 PLANNING DATA

Population, employment and student population forecasts were used to estimate the current and future loadings to the City's system.

Planning data from the Puget Sound Regional Council (PSRC) provides population forecasts based on U.S. Census data as broken down by Forecast Analysis Zones (FAZ). The PSRC data tends to be widely used throughout the region and is the data base that was used in developing and analyzing the flows.

After discussions with the City staff, the values were used for the baseline population and GIS delineation was used for the distribution of growth between the Sub-basins. Student populations were derived from the School District's forecast.

The service area is divided between eleven (11) Sub-basins. These 11 Sub-basins were used to encompass the entire service area boundary. The twelfth Sub-basin flows to the Lynnwood WWTP.

The definition of the population that has sewer service is complicated by the fact that some Edmonds customers are served to the City of Lynnwood. Conversely the Edmonds Wastewater Treatment Plant serves non-Edmonds customers. The population values and the methodology are presented in Chapter 6.

There are three segments that comprise the served population: residential, student and employment. These three sectors are generally thought to capture all the sources expected in the Edmonds Service Area. This approach works well in largely developed,

non-industrial service areas. Similar approaches were used in the Alderwood Water and Wastewater District's Comprehensive Plan in 2010 and in the City of Lynnwood's Comprehensive Plan in 2012.

With these values of existing and projected users, a population equivalent was developed recognizing that a student or an employee contributes a fraction of a permanent resident. This ratio was established to be 5 to 1 for students, meaning that 5 students is equivalent to a resident and 3 to 1 for employees (i.e. 3 employees is equivalent to a resident). This ratio is consistent with textbook values.

1.3 PROJECTED WASTEWATER FLOWS AND LOADS

A capacity analysis of the existing City sewer network was undertaken using the XP-SWMM hydraulic modeling program.

Existing lift stations and their firm capacities also were included in the model. The flow data from the City's flow meters were largely used in calibrating the model. The location of the flow meters was instrumental in delineating the Sub-basin boundaries. These Sub-basin areas were consistent with the basin boundaries used in the previous I/I study.

The model was developed using information from the City's GIS electronic database, supplemented by selected as-built drawings, pump records, flow monitoring data, and with other available data such as ground elevation LIDAR information.

Models were constructed to represent the network in 2010, 2019, 2033, and build out. The year 2010 was used for calibration purposes utilizing flow metering data at a eight locations in the collection system and three flow meters at the plant.

Various flow conditions were evaluated for the flow data from each of the meters. Flow data from 2006 through 2012 was evaluated and summarized in Appendix B. Data for calibration purposes focused on flow from the years 2010 through 2012.

- Average Dry Weather Flow was defined as the average daily flow for the months of July through October when no measureable rain was recorded.
- Average Daily Flow was defined as the average flow over the entire year
- Average Wet Weather Flow was defined as the average of the daily flows from the months of November through March
- Maximum Month Flows are valuable particularly for the WWTP and are typically thought to be the design flow events for the plant. From the flow records, the maximum monthly average for the years 2010 through 2012 was selected.
- Peak Day Flows are the measured maximum daily flows over the period of 2010 through 2012.
- Peak Hour Flows used the measured peak day flows, applying a peak day to peak hour factor and by adding the diurnal flow variation to arrive at this estimated flow.

With the flows determined and the known population equivalence, a flow per population equivalence was determined. With the multiple flow meters and the extensive flow data that spanned several years, we saw consistent flow patterns in all the flow meter data. This historical flow data was used to project future and anticipated flows.

There was an anomaly in the data measured in Meters 3 and the MLT meter at the WWTP. These two meters are downstream of the flow diversion to King County and consequently reflect lower total flows coming into the Edmonds system. This explains the low per population equivalent values seen at these two meters.

The I/I component is captured in and part of the peak day and peak hour per population equivalent flow values. It is important to recognize that the I/I component is reflective of current conditions and that, as the pipes continue to age and degrade, the volume of I/I entering the system will continue to increase. An allowance for that continued degradation is incorporated into the per population equivalent values for 2019, 2033 and build out conditions. The Engineering and Planning Subcommittee of Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC) has defined this degradation of sewers as a 7-percent per decade increase in I/I.

Though it might be acceptable to allow conditional surcharging of the conveyance lines, for the purposes of this analysis it has been conservatively estimated that no surcharging will be allowed. This effectively means that there is added and reserve capacity within the surcharging volumes.

Where pipe sections were identified as requiring an upgrade, the proposed upgrade was sized to provide capacity equal to or greater than the estimated build out flows and to prevent any conditional surcharging from occurring.

At lift stations where the estimated peak hour flows were shown to exceed the current firm capacity, a suitable build out upgrade flow capacity was estimated. This capacity was incorporated into the model for the planning horizon showing evidence of capacity limitation. This enabled the impact of the increased flow on the downstream sewer network to be investigated. The actual mechanical and electrical improvements to the lift stations would not likely be sized for the build out conditions.

The results of the capacity analysis were used to develop the capital improvement program detailed in Chapter 9.

1.4 CAPITAL IMPROVEMENTS PROJECTS

The capital improvement projects (CIP) developed in Chapter 9 are presented by time period. It should be noted that this plan has neither proposed a routing to extend sewers to every lot within the service boundary, nor was it the intention of this plan to finance those line extensions. The CIP does not include the line extensions and pump stations needed to serve presently unsewered areas. These line extensions are

assumed to be initiated and financed by developers or through ULIDs. Consequently, no City financing mechanism is proposed for these lines.

The CIP is limited to the following categories:

- Existing lines that need to be upgraded/upsized to convey flows as population and flows increase
- Existing lift stations that need to be upgraded to accommodate increasing flows.
- Existing lift stations that need modifications or improvements. This might include equipment that has reached or are soon to reach their useful life, needed new features, and stations that are slated to be abandoned or rerouted.
- Chronic maintenance areas that can be resolved with a capital project.
- WWTP improvements to respond to increasing flows, loads or new regulations

Cost estimates for each CIP was prepared based on current year (2013) pricing. Detailed cost estimates can be found in Appendix E. These projects were assigned a target period for completion based on the anticipated added flows and the expectation that capacity would be exceeded by the end of that period. Those improvements shown as 2013 to 2019 projects are those projects that have current or soon anticipated capacity issues and should be pursued first. Those that are in subsequent periods of 2019 to 2033 and 2033 to Build Out are projects that should be completed on or before that target year. Capital Improvements Projects to be financed through the Sewer Fund for those periods are presented in Table 9.3 and are summarized below:

CIP financed from the Sewer Fund:

2013	2014	2015	2016	2017	2018	2019
$7,752,814	$4,319,349	$3,000,000	$3,005,000	$2,975,000	$2,930,000	$2,975,000

CHAPTER II – INTRODUCTION

2.1 PURPOSE AND NEED FOR PLAN

This 2012 Comprehensive Sewer Plan is prepared for the City to fulfill the requirements of Chapter 173-240-050 of the Washington Administrative Code (WAC) and Chapter 90.48 of the Revised Code of Washington (RCW). The WAC requirements are outlined in Table 2.1.

Table 2.1
Comprehensive Sewer Plan Requirements per WAC 173-240-050

Reference Paragraph	Description of Requirement	Location in Document
3a	Purpose and need for proposed plan	Section 2.1
3b	Who will own, operate, and maintain system	Section 2.2
3c	Existing and proposed service boundaries	Figure 3.1
3d	Layout map showing boundaries; existing sewer facilities; proposed sewers; topography and elevations; streams, lakes; and other water bodies; water systems	Figures 3.2
3e	Population trends	Chapter 6
3f	Existing domestic and/or industrial wastewater facilities within 20 miles	Figure 2.1
3g	Infiltration and inflow problems	Section5.6 and Chapter 7
3h	Treatment systems and adequacy of such treatment	Chapters 5 and 8
3i	Identify industrial wastewater sources	Section 6.1.2
3k	Discussion of collection alternatives	Chapter 9
3k	Discussion of treatment alternatives	Chapter 8
3k	Discussion of disposal alternatives	Chapter 8
3l	Define construction cost and O&M costs	Chapter 9 and Appendix E
3m	Compliance with management plan	Section 10.3.6
3n	SEPA compliance	Appendix D

In addition to the WAC requirements sited above, there are other recent state and local regulations that must be incorporated into the Comprehensive Sewer Plan Update. These additional requirements are outlined in Table 2.2.

Table 2.2
Additional Sewer Plan Requirements per State and Local Regulations

Description of Requirement	Location in Document
Evaluation of wastewater reuse per *Substitute Secondary Senate House Bill 1338*	Section 9.4
Capacity, Management, Operations and Maintenance (CMOM).	Section 10.3.5

The Plan provides a comprehensive guide to assist the City with managing and operating the sewer system and coordinating expansions and upgrades to the

infrastructure for the next thirty years. The Plan serves as a guide for policy development and decision making for the City. It also provides other agencies and the public with information on the City's plans for sewer system extensions within the City's service area. This approach allows the City to provide high quality service to its customers and to continue protecting environmental quality.

The Plan evaluates existing and future capacity of the sewer system based on current and anticipated future wastewater flow rates. Future wastewater flow rates are estimated from existing flow data and population growth projected within the sewer service area.

An implementation plan is provided, including an estimated timeline for constructing selected projects. The financial analysis and the means by which the improvements were to be financed were addressed in Chapter 11. This chapter was prepared by FCS Group in close coordination with BHC and the City.

2.2 OWNERSHIP AND MANAGEMENT

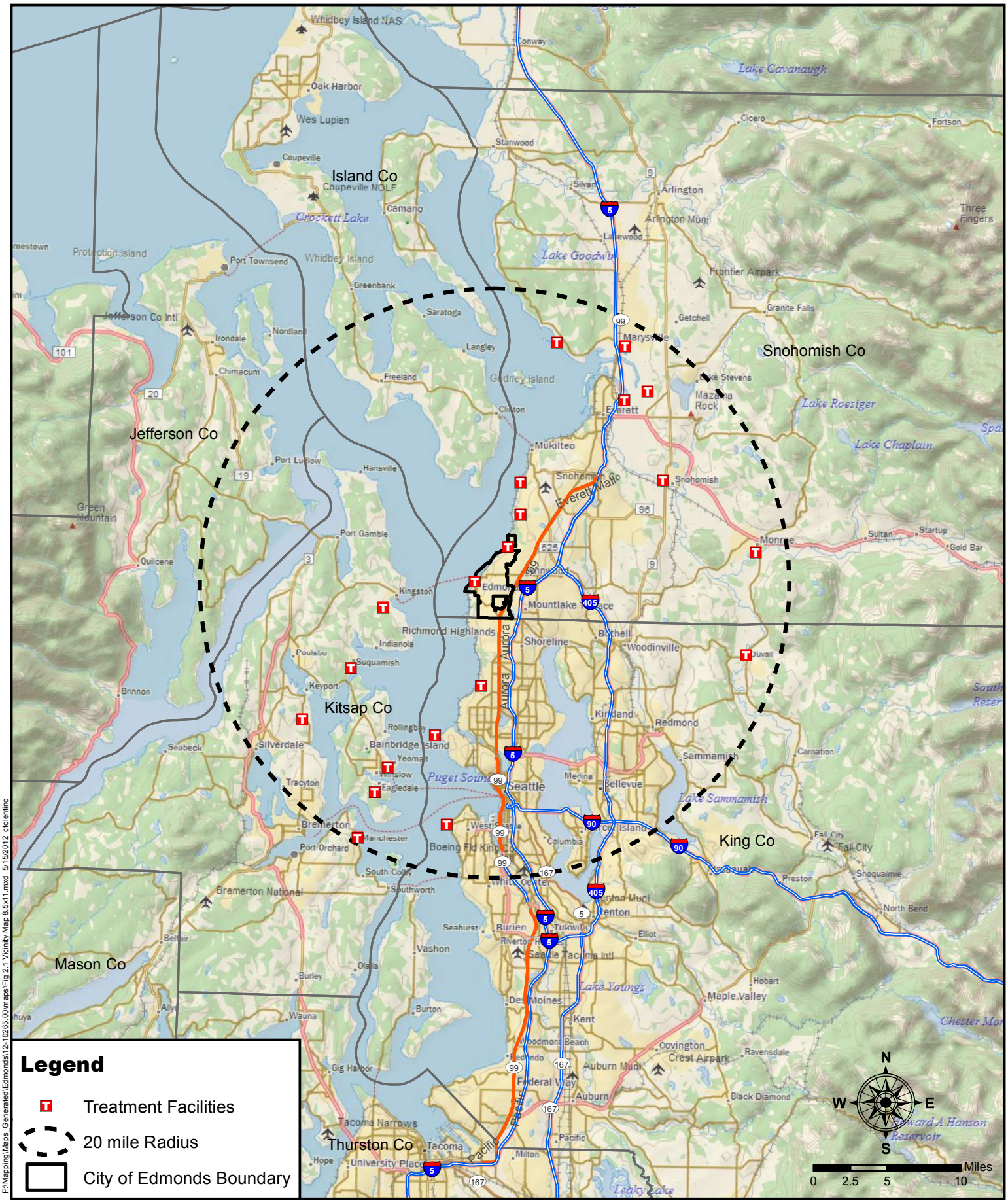
The City owns and maintains a public wastewater system and is governed by a City Council. The City has agreements for sewage collection and treatment with some of the surrounding municipalities and special purpose districts for reciprocal sewage treatment. These agreements are further explained in Chapter 3.

The City's wastewater system is under the general management of Mr. Jim Waite. The Sewer Division consists of 7.5 Full-time equivalent workers while the Treatment Plant employs 15 full time workers. The treatment plant is operated and managed under the general direction of Pamela Randolph. Additional Engineering and Administrative and Engineering employees are not accounted for in the above employment numbers.

2.3 SYSTEM HISTORY AND BACKGROUND

The City of Edmonds is located in southwest portion of Snohomish County, immediately north of the King County – Snohomish County boundary, as shown on Figure 2.1, Vicinity Map. The City's service area extends outside of the municipality boundaries into Mountlake Terrace and Shoreline, to the East and to the South. The City also sends a portion of the sewage north to Lynnwood and ultimately to the Lynnwood Wastewater Treatment Plant. The City encompasses approximately 8.9 square miles and but its service area is approximately 19.5 square miles. The area known as Esperance is an unincorporated area that is completely surrounded by the City of Edmonds.

Edmonds was incorporated in 1890 but a sanitary sewer system was not developed until 1920. A primary sewage treatment plant was constructed in 1957. The treatment plant was further expanded to accommodate agreements sewage treatment for portions of Mountlake Terrace and Ronald Wastewater District in 1959.



This map is a geographic representation based on information available. No warranty is made concerning the accuracy, currency, or completeness of data depicted on this map.

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VICINITY MAP

COMPREHENSIVE SEWER PLAN
City of Edmonds
May 2012

Figure
2.1

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In 1967, another treatment plant expansion took place as a result of increased service areas within the City and additional flows from Olympic View Sewer and Water District. Secondary treatment was designed subsequent to a 1986 report by CWC/HDR and was operational by 1991.

The City provides sanitary sewer service to customers within its sewer service area. Wastewater ultimately flows to one of three locations:

- Edmonds Wastewater Treatment Plant, which is owned and operated by the City.

- Brightwater Wastewater Treatment Plant, which is owned and operated by King County Metro. The City has an agreement with the County (see Appendix G) to send a portion of Edmonds sewage to the County for treatment via the Lake Ballinger Pump Station. In turn, the City receives and treats the sewage from the Richmond Beach Service Area. This agreement is describe further in Section 3.4.2.

- Lynnwood Wastewater Treatment Plant, which is owned and operated by the City of Lynnwood. The City has an agreement with Lynnwood to send a portion of the Edmonds sewage to Lynnwood for treatment.

Wastewater that affects the total flows through the City's collection and conveyance system can be categorized into three sources:

- Direct service. Flow from customers within the boundaries of the City that is also treated at the Edmonds Wastewater Treatment Plant.

- Lynnwood service. Flow that originates within City of Edmonds corporate boundaries and is sent to Lynnwood for treatment. The City maintains the sewer infrastructure (pump stations and sewer mains) and compensates Lynnwood for treatment.

- Tributary Service. Flow that originates from areas outside the City boundaries from other sewering agencies. These tributary areas include flow from City of Mountlake Terrace, Ronald Wastewater District, Olympic View Water and Wastewater District and small portions of the City of Lynnwood.

Inter-local agreements between the City and the neighboring sewering agencies define the terms by which sewer service is provided. It is possible that those agreements could be amended in the future but it is unlikely that flows would be routed differently than currently described. It is assumed for the purposes of this Plan that the flows will continue under the current routing mode and that there would be no change to the current inter-local agreements that govern these sewer services. Consideration should be given to investigate rerouting options. A recommendation for this study is included in Chapter 9.

Planning for future wastewater operations requires the City to address the land use decisions within the City sewer service boundary as determined by the City of Edmonds, the City of Shoreline and the City of Mountlake Terrace.

2.4 SERVICE AREA CHARACTERISTICS

The City boundaries lie entirely within Snohomish County. However, the service area has portions that extend into the City of Shoreline (King County).

The service area is generally built out and is characterized as a bedroom community largely comprising of single or multi-family residential units. The topography within the City ranges from flat and gently rolling to hilly with steep slopes along the stream corridors and those properties immediately adjacent to Puget Sound. Wetlands are found adjacent to the many creeks, small streams and lakes within the City service area (see Figure 3.2).

Sewer service extensions presented in this report are planned only within the City's service area boundary. These boundaries are shown on Figure 3.1. Since the City is bounded by other sewering agencies on all sides, it is not anticipated that the service area boundaries would be expanded. Though not likely, it is possible that the City could re-route sewer infrastructure from the northern portion from Lynnwood WWTP back to Edmonds WWTP. Similarly, some flows within the City boundaries could be rerouted differently to avoid lines or pump stations that are shown to have capacity issues.

The City could potentially also install a Lift Station upstream of Lake Ballinger Pump Station. While this would likely not increase flows to the WWTP it would eliminate the need for gravity main upsizing and would eliminate or reduce payments to King County for Lake Ballinger Operations and Maintenance.

2.5 CITY SEWER POLICIES

Development of the City's Comprehensive Sewer Plan is currently guided by the Comprehensive Plans from the adjacent agencies.

The City's policy for sewer service recognizes that its function is not to plan land uses for the service area but to respond to land uses planned by the land use planning agencies.

The public sewer system in the City may be extended by one of two methods. One being a developer extension agreement, where a developer, property owner or a group of property owners request and construct a sewer under the terms and conditions of a developer extension agreement. The second method is a Utility Local Improvement District (ULID) process following RCW 35.43.040 and 35.43.042, where a group of property owners petition the City to extend sanitary sewers to their area and then are assessed for the sewer improvements.

It is the City's policy that the property owners desiring sewer service initiate a request for sanitary sewer service. After entering a Developer's Extension Agreement with the City, the proposed sewer design will be reviewed by the City to ensure compliance with the standards and design criteria. Sewer extensions shall follow the current version of the City of Edmonds "Standard Specifications Manual" and the "Developer Extensions Manual" as provided in the Developer's Extension Agreement. Once the improvements have been constructed and confirmed through the City inspection to meet established standards, then it shall be deeded to the City.

The City Council has the authority to set policies, ordinances, and zoning. The City may find it necessary from time to time to reevaluate their policies based on Snohomish County and adjacent City land use, policies and ordinances.

CHAPTER III – LAND USE AND SERVICE AREA

3.1 SERVICE AREA DESCRIPTION

The existing sewer service area for the City can be described as comprising four different service areas as summarized below:

City of Edmonds. The City of Edmonds municipal boundaries comprise of 5,700 acres. Approximately 4,450 acres within the City of Edmonds is collected and treated at the Edmonds WWTP. The City both owns and maintains this portion of the system and is responsible for treatment. Approximately 1,250 acres on the northern boundary the City of Edmonds is collected and treated at the Lynnwood WWTP. The City owns and maintains this portion of the system and Lynnwood is paid on an ERU basis for the sewage treatment. Additionally, Olympic View Water and Sewer District maintains a sewer system within Edmonds City limits. All Olympic wastewater is collected and treated at the Edmonds WWTP.

King County and City of Woodway. The City of Woodway is collected and conveyed to the Edmonds WWTP, together with the Richmond Beach Pump Station flow, via the Richmond Beach/Woodway sewer trunk. The sewers within this area are owned and maintained by Olympic View Water and Sewer District. The County operates the Richmond Beach Pump Station. An agreement was signed in 2000 for "reciprocal sewage treatment" with King County which is further explained in 3.4.2.

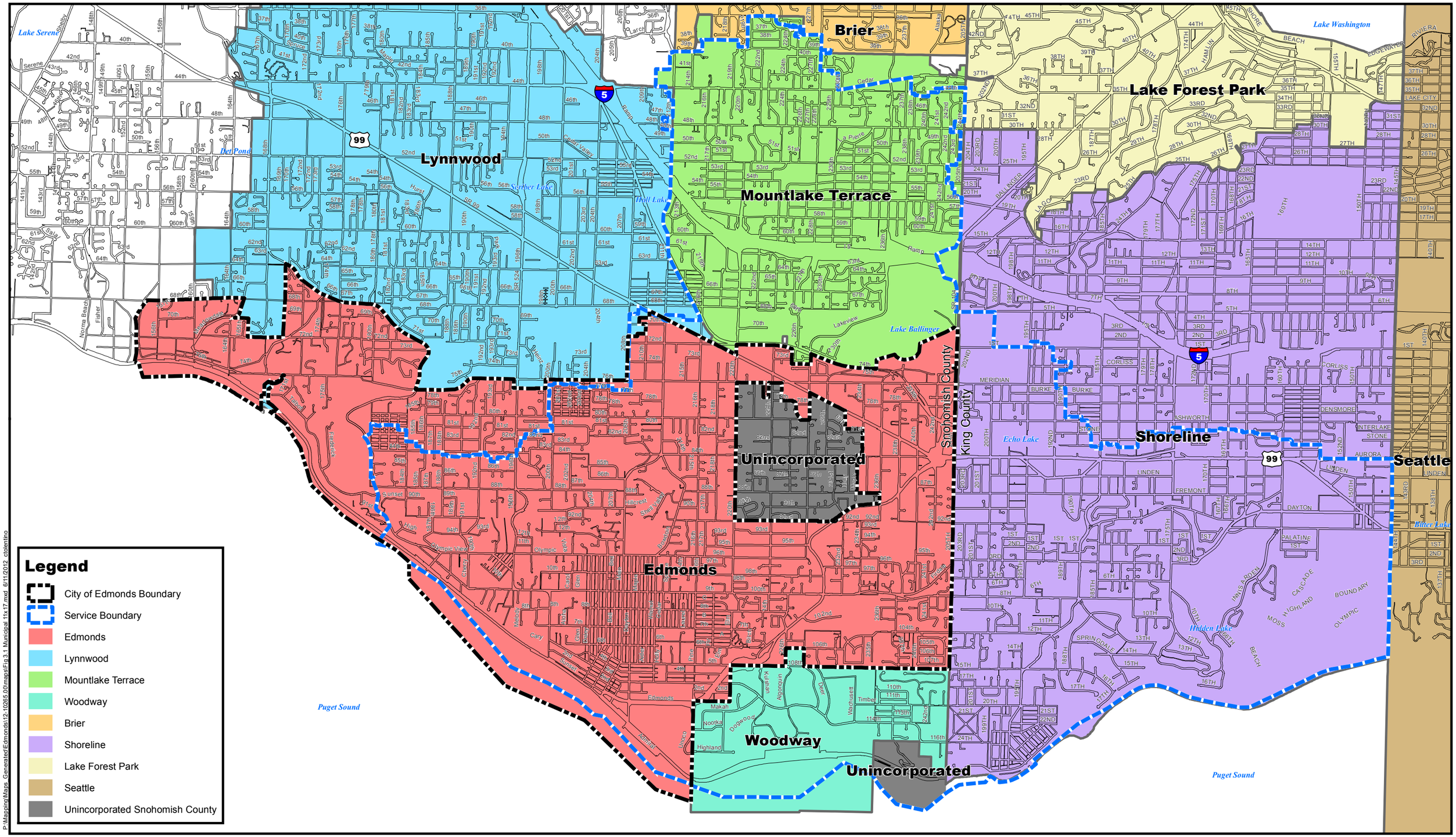
***City of Mountlake Terrace*.** The City of Mountlake Terrace lies directly east of the City of Edmonds. The sewage from Mountlake Terrace is collected and conveyed by the Lake Ballinger Pump Station, near SR 104 or N 205th St. The sewer lines are owned and maintained by Mountlake Terrace and the Lake Ballinger Pump Station is owned and operated by King County. Operations of the Lake Ballinger Pump Station are described further in 3.4.2.

Ronald Wastewater District and City of Shoreline. The southern portion of the City's service area is located in the City of Shoreline. Shoreline does not own or maintain any sanitary sewer system components; these portions are either owned by King County or Ronald Wastewater District.

3.2 SURROUNDING VICINITY CHARACTERISTICS

3.2.1 Topography

Figure 3.1 shows the City's service area boundary and the corporate boundaries of the cities described in Section 3.1.



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\Fig 3.1 Municipal 11x17.mxd 6/11/2012 ctolentino

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GIS Data: City of Edmonds, Snohomish & King County base data.

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NORTH

0 1,600 3,200 6,400 Feet

Scale in Feet

CITY OF EDMONDS Inc. 1890

MUNICIPAL BOUNDARIES

COMPREHENSIVE SEWER PLAN

City of Edmonds

May 2012

Figure **3.1**

The topography of the City ranges from flat and gently rolling to hilly, with a few steep slopes along the stream corridors and property immediately adjacent to Puget Sound. Wetlands, lakes and many creeks and small streams are found throughout the City (see Figure 3.2).

3.2.2 Geology

The retreat of glaciers at the end of the last ice age formed the rolling terrain characteristic of the City. Erosion and flooding of low lying areas during that period resulted in soil deposits of two primary classifications as identified by the United States Department of Agriculture, Soil Conservation Service. These soil types are the Alderwood Series and the Everett Series, which are described below and displayed on Figure 3.3.

The Alderwood Series is the most prevalent soil type in the City. The soil is moderately well drained and has a weakly consolidated to strongly consolidated substratum at a depth of 24 to 40 inches. Permeability is moderately rapid in the upper horizons but very slow in the consolidated substratum. These moderately well drained acidic forested soils formed in loamy glacial till and occur on rolling till plains and moraines.

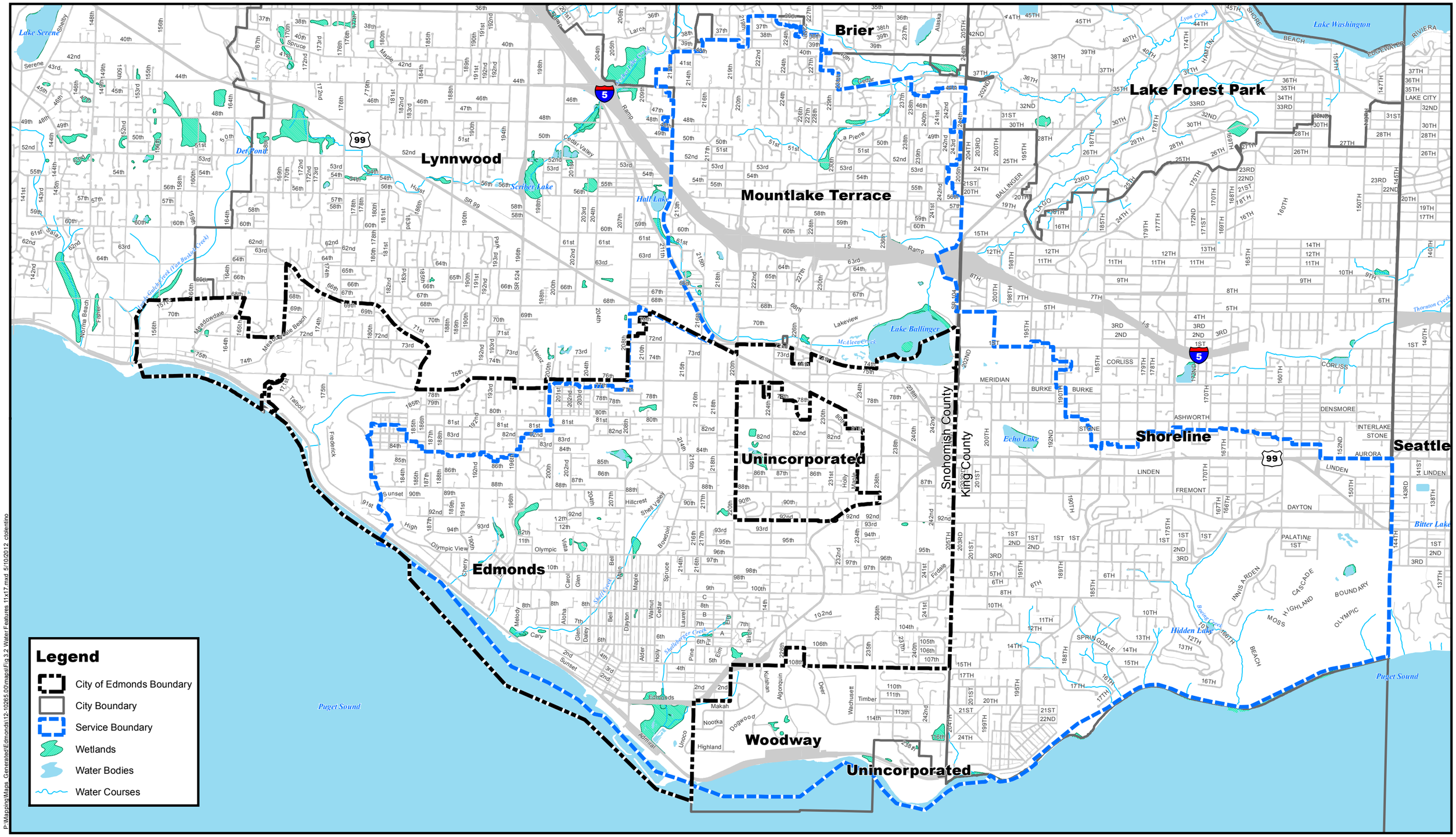
The Everett Series forms the soils located on outwash plains, terraces, and fans and occur on slopes ranging from 0 to 65 percent. These soils are glacial outwash, characterized as somewhat excessively drained, gravelly, gently undulating soil underlain by sand and gravel and found on terraces.

3.2.3 Water Resources

The City's municipal water system provides service to approximately 80 percent of the population within the City limits or more than 10,050 customer accounts. The other 20 percent of the City's population receive water service from the Olympic View Water & Sewer District, which is located within the southwest portion of the City limits.

All water supplied to the City customers is currently purchased from Alderwood Water and Wastewater District and is conveyed through a single metered connection near the northeast corner of the water system. The City also has the capacity to serve a portion of its system with water purchased from Seattle Public Utilities (SPU), but currently maintains this source of supply and the single metered connection on standby. Water purchased from Alderwood Water and Wastewater District originates from the City of Everett Sultan River source. Water supplied by SPU originates from SPU's Tolt River source.

Interties are also provided with the City of Lynnwood and Olympic View Water District (see Figure 3.4).



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\Fig 3.2 Water Features 11x17.mxd 5/10/2012 ctolentino

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Wetlands: Snohomish County, March 2004
King County, November 2004

Wetland locations in the dataset are approximate. This dataset contains polygons that represent the basic wetlands categories used in the King County Stream and Wetlands Survey. All wetland areas within this dataset should be surveyed before land use changes are made.

GIS Data: City of Edmonds, Snohomish & King County base data.

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NORTH

0 1,600 3,200 6,400 Feet

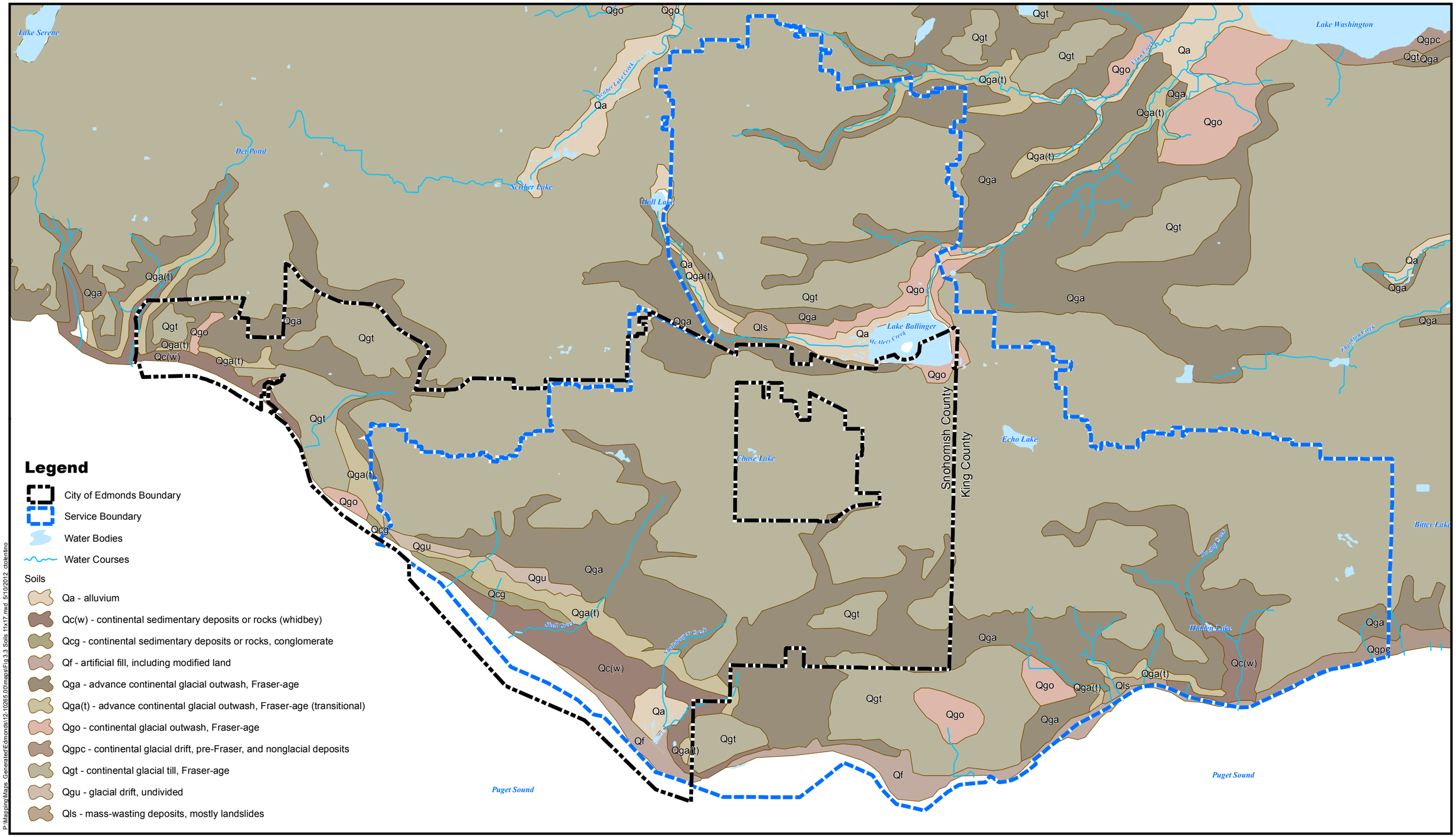
Scale in Feet

CITY OF EDMONDS Inc. 1890

WATER FEATURES

COMPREHENSIVE SEWER PLAN
City of Edmonds
May 2012

Figure **3.2**



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\Fig 3.3 Soils 11x17.mxd 5/10/2012 cdolentino

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Soils Data: Washington State Department of Natural Resources 2005

GIS Data: City of Edmonds, Snohomish & King County base data.

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NORTH

0 1,600 3,200 6,400 Feet

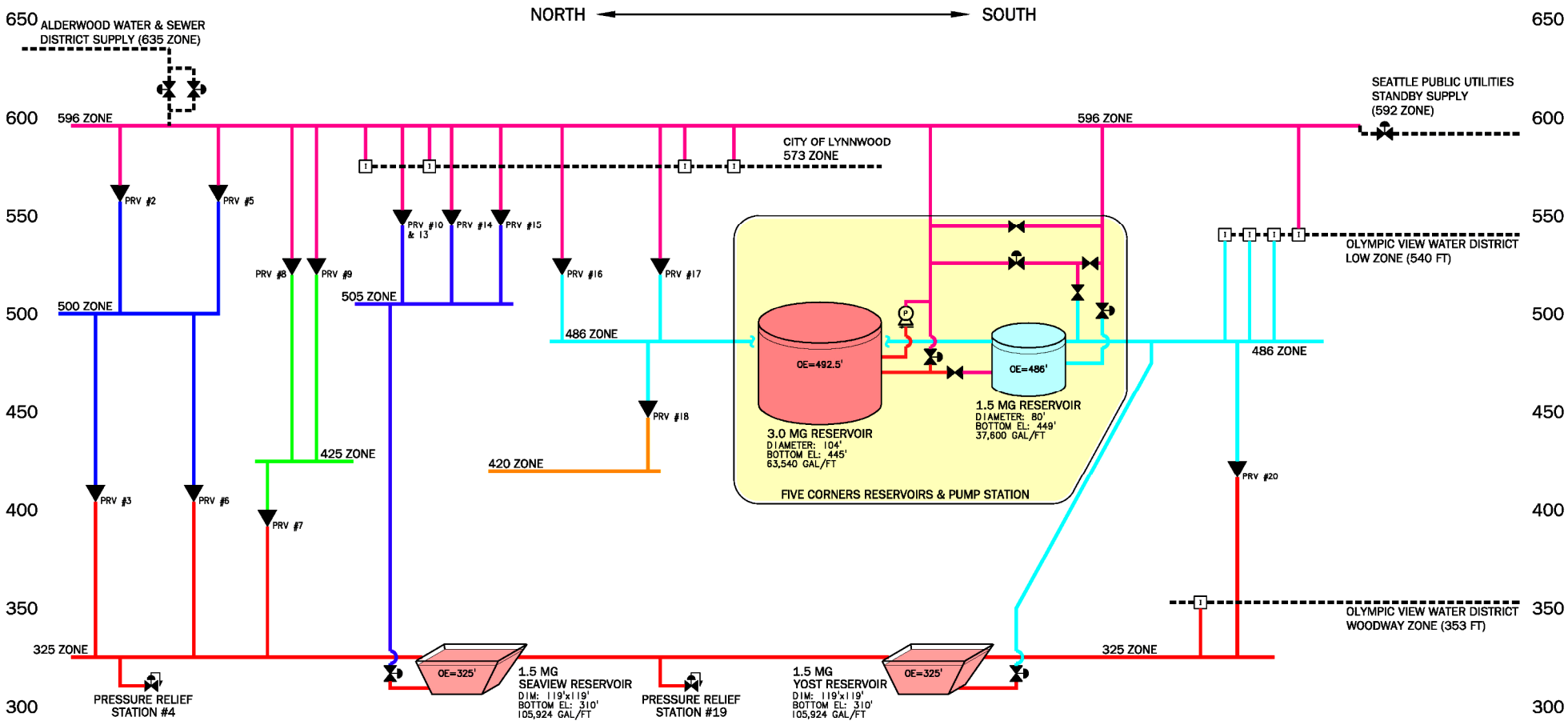
Scale in Feet

CITY OF EDMONDS Inc. 1890

SOILS MAP

COMPREHENSIVE SEWER PLAN
City of Edmonds
May 2012

Figure **3.3**



LEGEND

- 596 ZONE
- 505 ZONE
- 500 ZONE
- 486 ZONE
- 425 ZONE
- 420 ZONE
- 325 ZONE
- ADJACENT SYSTEM
- PRESSURE REDUCING STATION/VALVE
- ISOLATION VALVE
- CONTROL VALVE
- PRESSURE RELIEF STATION
- INTERTIE
- PUMP STATION
- FACILITIES AT SAME SITE

ABBREVIATIONS

EL	ELEVATION
FT	FEET
MG	MILLION GALLONS
OE	OVERFLOW ELEVATION

Image Source: City of Edmonds
Comprehensive Water System Plan, MSA August 2010

P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 3.4 Water System Schematic 8.5x11.mxd 3/27/2013 ctolentino

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WATER SYSTEM SCHEMATIC

COMPREHENSIVE SEWER PLAN
City of Edmonds
March 2013

Figure
3.4

Surface Water – The two most dominant fresh water features in the sewer service area are Lake Ballinger and Echo Lake. Lake Ballinger is by far the larger of the two and is located in the central western portion of the City, near I-5 between the City of Edmonds and City of Mountlake Terrace. It has an intermittent inlet and drains through McAleer Creek to Lake Washington. The lake has a surface area of 100 acres, a mean depth of 15 feet, and a maximum depth of 25 feet.

Echo Lake is located in Shoreline, a few blocks east of Highway 99. Echo Lake has an area of 12 acres and a watershed area of 288 acres.

Puget Sound borders the City on the west.

Groundwater – A study done in 1997 by the US Geological Survey found that 94% of the groundwater in South Snohomish County was considered soft to moderately hard. No appreciable widespread groundwater contamination was found at the time of the study.

Concentrations of arsenic, iron and manganese were the most widespread groundwater problems in the area. The population growth in Snohomish County has increased dramatically in the last 10 years and has affected the quantity and the quality of groundwater. Most groundwater recharge in Snohomish County is from infiltration of precipitation, and impervious surfaces caused by increased development prevent infiltration. Consequently, less groundwater is becoming available as land development increases.

3.3 LAND USE

3.3.1 Growth Management Act

The State of Washington adopted the Growth Management Act with the intent of concentrating most new development and population gains within urban areas of the more populous and rapidly growing counties. These counties are required to define an urban growth boundary within which urban services like sewers are provided, and any new parcels created outside that boundary must be low density with sufficient acreage to support onsite sewage disposal systems conforming to State Health regulations.

The entire service area is within the GMA boundaries of the City or the adjacent cities for urban development. Consequently, the limitations on extending sewer service to unsewered areas is a non-issue.

Zoning within the service area can be classified as commercial/industrial, low density multi-family, high density multi-family, single family, and undeveloped lands such as public right of ways, parks, and open space. These zoning areas are depicted in Figure 3.5. Low density multi-family zoning allows a variety of low-density, multi-family housing including townhouses, multi-family structures and attached or detached homes on small lots.

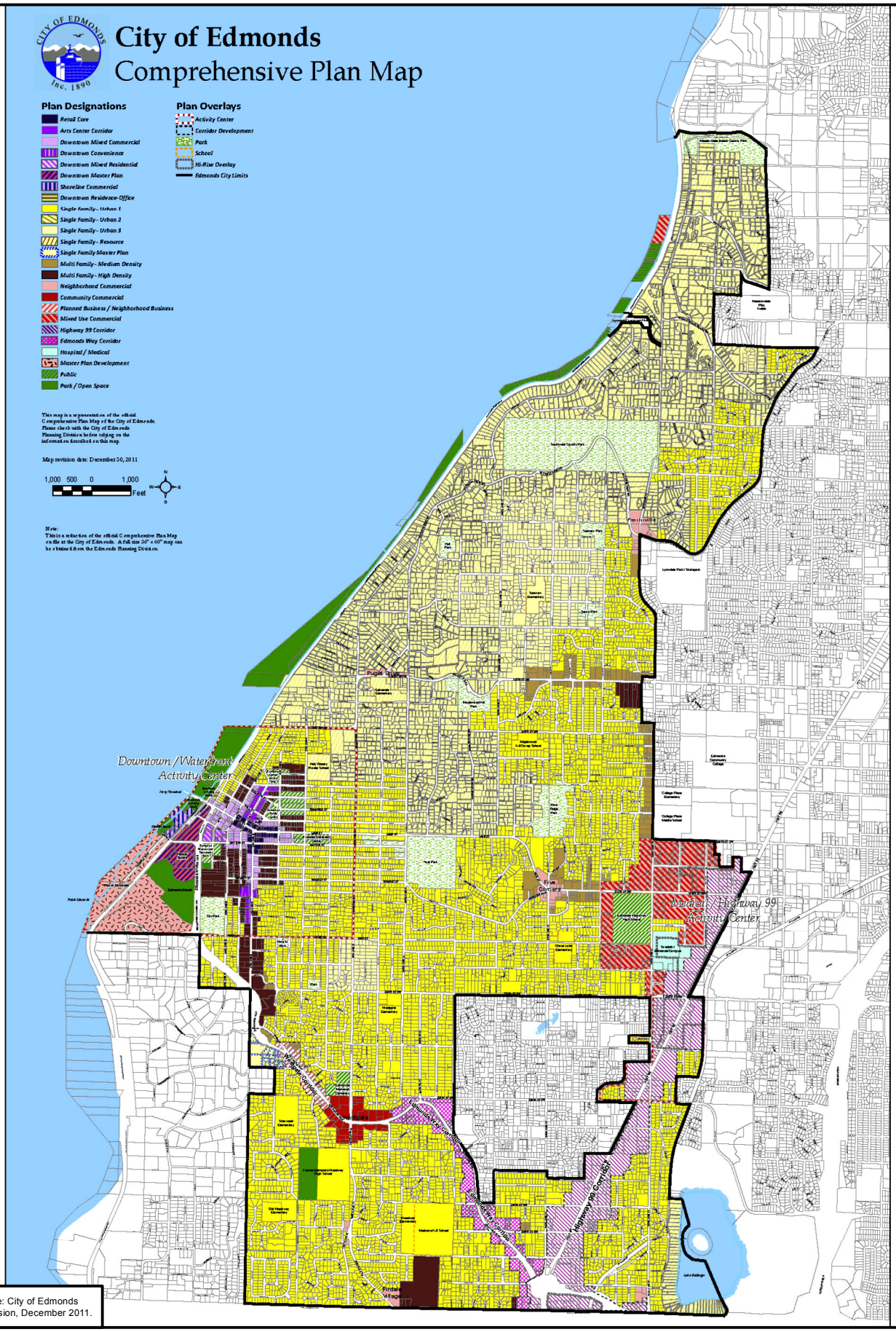

Image Source: City of Edmonds Planning Division, December 2011.

P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 3.5 Comp Plan 8.5x11.mxd 4/4/2013 ctolentino

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COMPREHENSIVE PLAN MAP

COMPREHENSIVE SEWER PLAN
City of Edmonds
March 2013

Figure
3.5

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3.4 RELATIONSHIPS WITH ADJACENT SEWERAGE AGENCIES

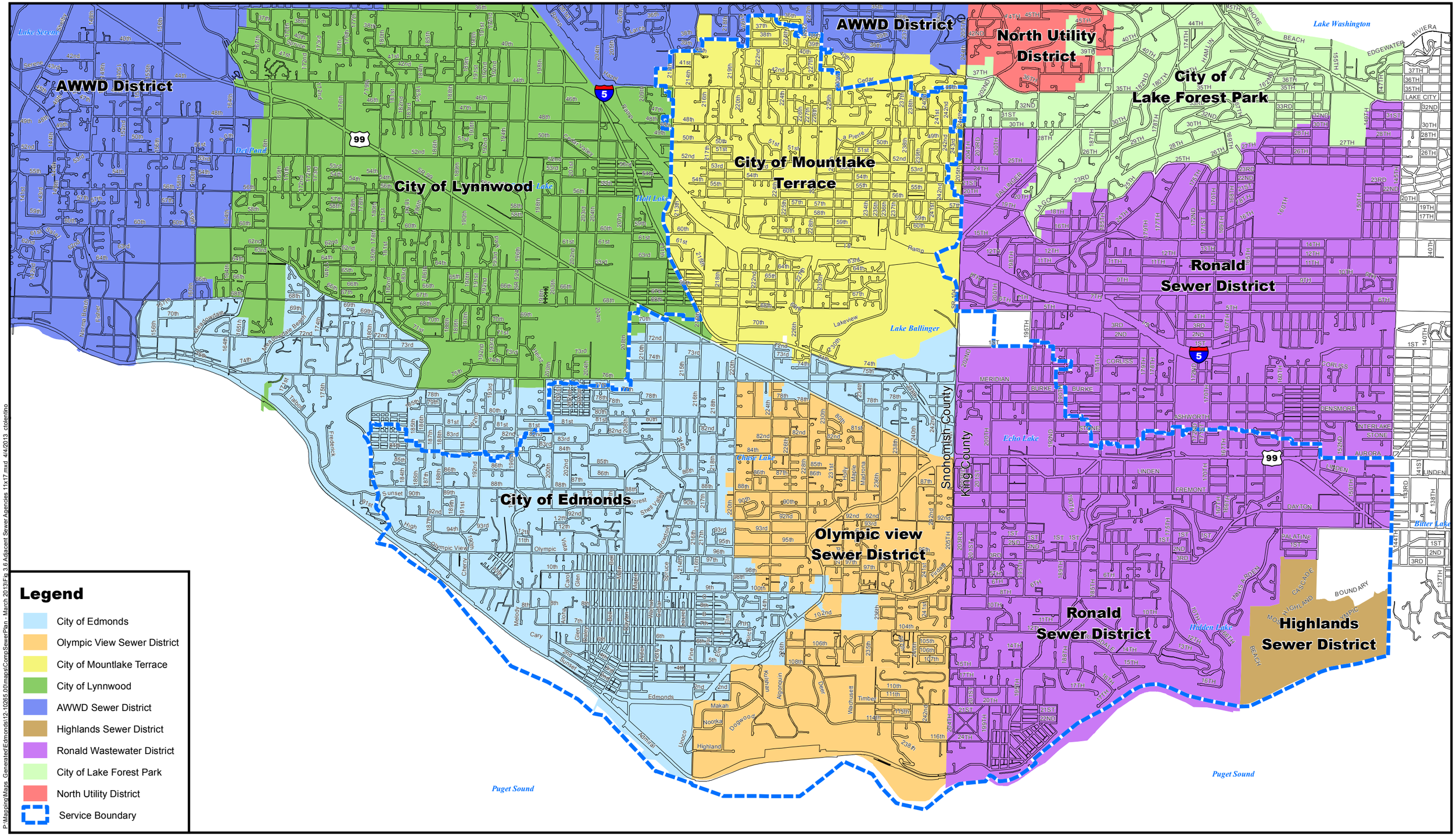
Neighboring agencies such as utility districts and municipalities provide sewer service adjacent to the City of Edmonds. Summaries of the agreements made between the City of Edmonds and the various agencies are described below, as well as background information on each of the adjacent service providers. Copies of the referenced interlocal agreements are included in Appendix G.

- City of Lynnwood
- King County Metro
- City of Mountlake Terrace
- Ronald Wastewater District
- Olympic View Water and Wastewater District

The geographical relationship between these agencies is represented on Figure 3.6. To better understand the current contractual agreements with the neighboring sewer utilities, refer to graphical presentations on Figures 3.7 to 3.10.

3.4.1 City of Lynnwood

City of Lynnwood borders the northeast portion of the City of Edmonds. A portion of the flows within Edmonds municipal boundaries are routed to the Lynnwood Sanitary System and treated at the Lynnwood WWTP. This accounts for approximately 15% of the influent flow into the Lynnwood WWTP or about 300,000 gallons per day (Annual Average Flow). The City of Edmonds owns and maintains the sewer infrastructure in this area but pays Lynnwood on a per customer basis for the treatment. As of 2010, there is an approximate sewered population of 6,200, and an employment population of 509. There are no schools in this zone. See Figures 3.7 and for a map of the area. City of Edmonds also receives a small portion of flow from Lynnwood boundaries that flows through the Meter 1 Sub-basin (see Figure 5.1). This is estimated at approximately 0.5% of the total flow tributary to Edmonds WWTP.



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 3.6 Adjacent Sewer Agencies 11x17.mxd 4/4/2013 clolentino

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NORTH

0 1,600 3,200 6,400 Feet

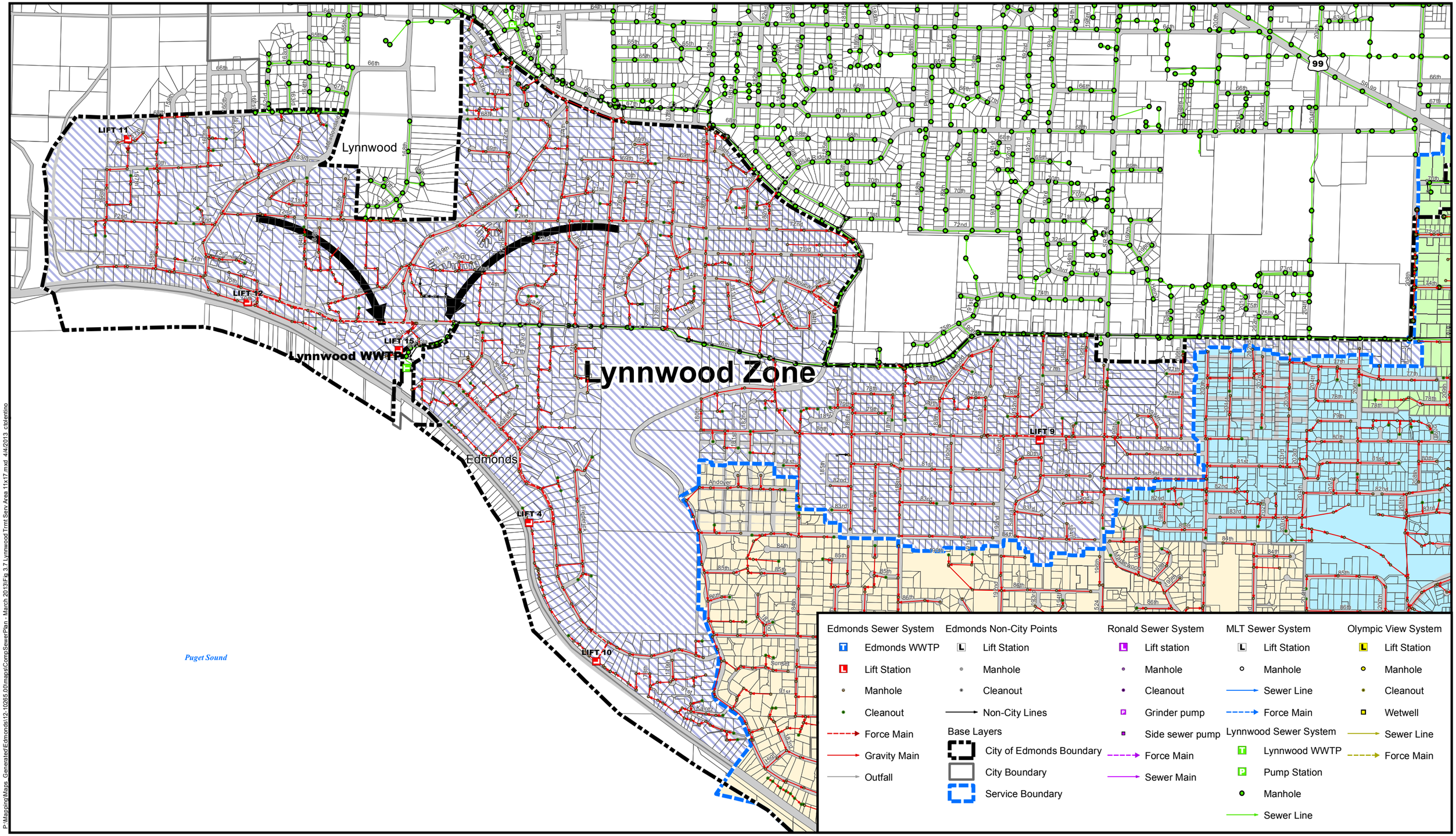
Scale in Feet

CITY OF EDMONDS Inc. 1890

ADJACENT SEWER AGENCIES

COMPREHENSIVE SEWER PLAN
City of Edmonds
March 2013

Figure **3.6**



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 3.7 Lynnwood Trmt Serv Area 11x17.mxd, 4/4/2013, ctolentino

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Sewer System: City of Edmonds - December 2011
City of Lynnwood - March 2011, Olympic View Sewer District 2007
City of Mountlake Terrace (MLT) - 2012, Ronald Wastewater District 2010

GIS Base Data: City of Edmonds, Snohomish County & King County.
Data sources supplied may not reflect current or actual conditions.
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NORTH

0 750 1,500 3,000 Feet

Scale in Feet

LYNNWOOD TREATMENT SERVICE AREA

COMPREHENSIVE SEWER PLAN
City of Edmonds
March 2013

Figure
3.7

3.4.2 King County

The Richmond Beach Sub-basin area, as shown in Figures 3.8 and 5.1, is maintained and operated by Ronald Wastewater District and King County. Flow from the Richmond Beach Pump Station is ALWAYS sent to the City of Edmonds and treated at the City of Edmonds WWTP. King County also operates the Lake Ballinger Pump Station which serves a portion from Edmonds, Mountlake Terrace and Ronald Wastewater District (Meter B Sub-basin). This area is also referred to as "Edmonds East" in the 2000 Agreement with King County. The Edmonds East catchment has a considerably more populated area than Richmond Beach and thus, produces higher flows. The City of Edmonds and King County executed an agreement on October 6, 2000 that addresses responsibilities for the flow. The responsibilities are described in brief below and the full agreement can be seen in Appendix G.

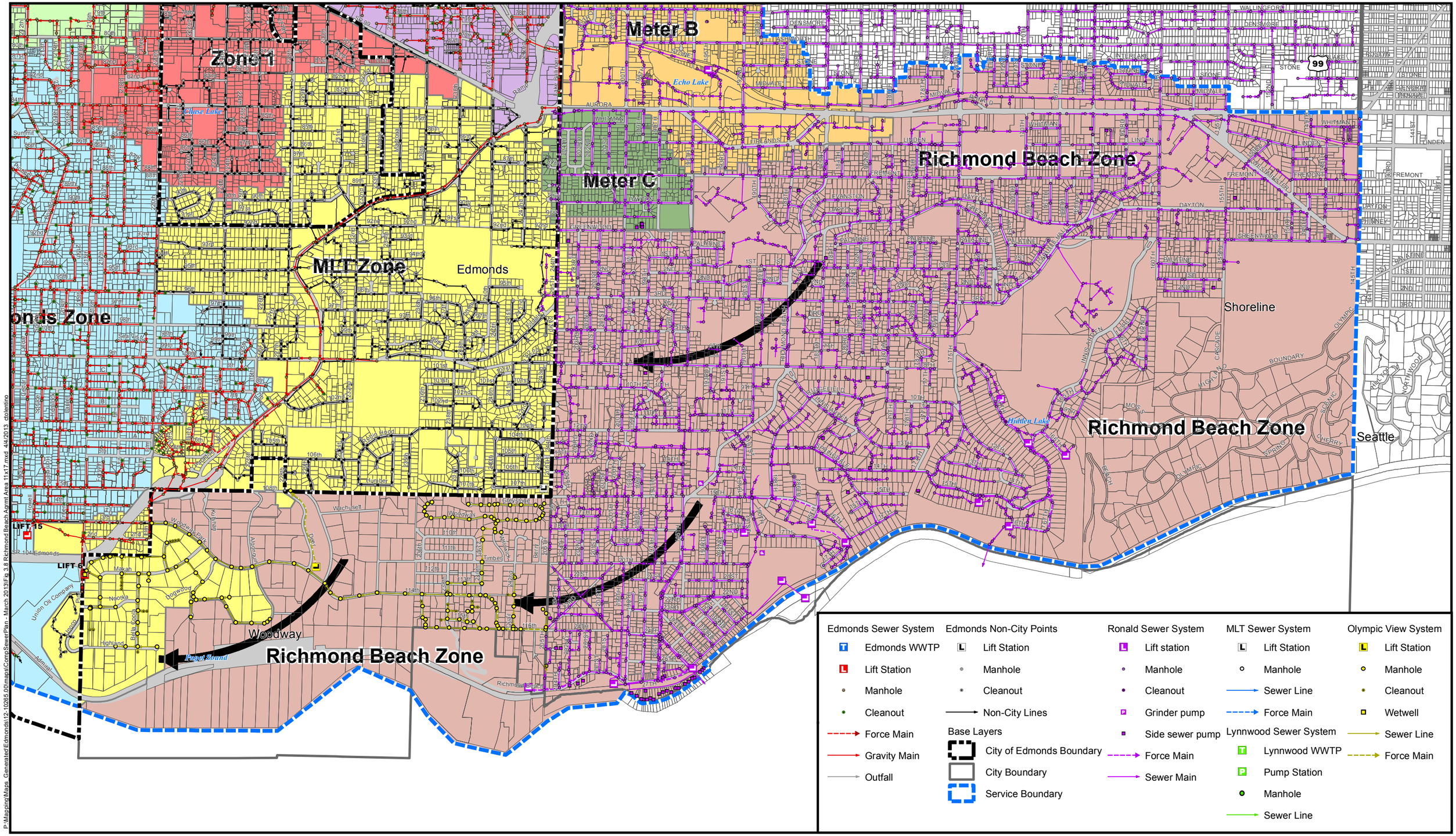
Sewage Treatment Responsibilities – January 1, 2000 to January 1, 2012

The agreement recognizes an initial period, defined in the agreement as 2000 to 2012, where Edmonds was responsible for seasonal treatment from BOTH Richmond Beach and Lake Ballinger Pump Station. This was presumably done while King County increased treatment capacity within their system (i.e. build the Brightwater Wastewater Facilities). During this period, sewage from Richmond Beach ALWAYS was conveyed to and treated at the Edmonds Wastewater Treatment Plant. All Lake Ballinger Flow was treated by Edmonds during the winter/spring months from November 1 until April 30. During the summer months, the flow swap was engaged and the County received a volumetric flow out of Lake Ballinger approximately equal to what the City is treating out of the Richmond Beach Sub-basin Area. There were limited periods that King County received all flows from Lake Ballinger, presumably when Edmonds needed to make repairs to their system. Edmonds was compensated $100,000 per year for this agreement.

Sewage Treatment Responsibilities – January 1, 2012 to July 1, 2036

In a subsequent agreement for the period January 1, 2012 to July 1, 2036, King County is responsible for treating a volumetric flow from the Lake Ballinger Pump Station that is equal to the flow pumped into Edmonds from the Richmond Beach Sub-basin area for the ENTIRE year. The flow in excess of this volume is directed to and treated by the Edmonds WWTP. Edmonds is responsible for Operations and Maintenance costs of the Lake Ballinger Pump Station based on the amount of flow pumped into Edmonds system (See Appendix G).

Theoretically, under the conditions of the flow swap, the flow from Richmond Beach Sub-basin should be within 5% of the flow sent to King County through the Ballinger Pump Station. Richmond Beach flow can be estimated by the influent parshall flume meter at the WWTP for Richmond Beach. The flow diverted out of Lake Ballinger can be estimated by subtracting the total flow into the Station (Meters A, B, D) from the downstream flow into the Edmonds system (Meter 3 minus Meter C). For the most part, in 2012, King County sent flow to Edmonds from the hours of 3 pm to 6 am. This



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 3.8 Richmond Beach Agrmt Area 11x17.mxd 4/4/2013 dbolentino

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City of Lynnwood - March 2011, Olympic View Sewer District 2007
City of Mountlake Terrace (MLT) - 2012, Ronald Wastewater District 2010

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NORTH

0 1,000 2,000 4,000 Feet

Scale in Feet

RICHMOND BEACH AGREEMENT AREA

COMPREHENSIVE SEWER PLAN

City of Edmonds
March 2013

Figure **3.8**

indicates that they are matching the daily flow out of Richmond Beach in a 9 hour period, 6 am to 3 pm. In recent years and for the summer months it appears that the flow through Lake Ballinger Pump Station exceeds the flow through Richmond Beach Pump Station by approximately 1 MGD.

3.4.3 City of Mountlake Terrace

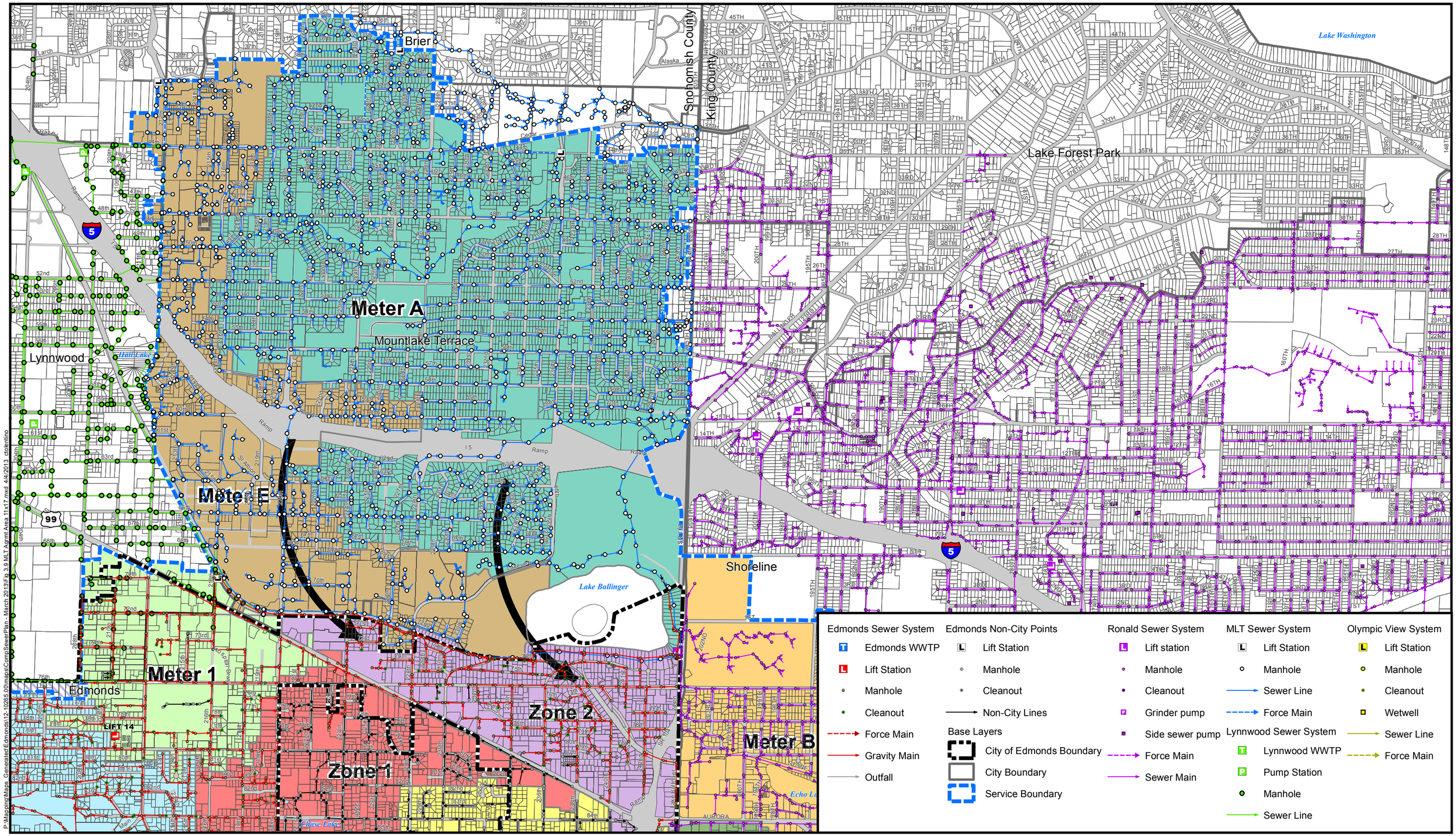
The City of Mountlake Terrace is adjacent to the southeast border of the City of Edmonds. Mountlake Terrace lies east of SR 99 and Edmonds to the west. A portion of the City of Mountlake Terrace's sewer system is routed to the Lake Ballinger Pump Station (approximately 2,265 acres). The sewage is then either routed south to King County Facilities or north to the Edmonds WWTP per the City of Edmonds/King County Agreement for Reciprocal Sewage Treatment. Regardless of where the sewage is routed, City of Mountlake Terrace is contractually bound to the City of Edmonds for treatment of the sewage flow. See Figure 3.9 for a map of the described area.

3.4.4 Ronald Wastewater District

Ronald Wastewater District is located within City of Shoreline municipal boundaries and is directly south of the City of Edmonds. A May 17th, 1988 agreement between City of Edmonds and Ronald Wastewater allows a portion of Ronald's flow to be conveyed to and treated at Edmonds WWTP. Ronald Wastewater District owns and maintains the sewer infrastructure in this area but pays Edmonds for treatment. Some of the flow from Ronald is directed through the Lake Ballinger Pump Station and may actually flow to King County per the Reciprocal Sewage Treatment Agreement. However, Ronald is still obligated to pay the City of Edmonds for all treatment costs. Figure 3.10 shows the portion of Ronald Wastewater District that flows north to Edmonds.

3.4.5 Olympic View Water and Wastewater District

Olympic View Water and Wastewater District maintains and operates a sewage system within the City of Edmonds municipal boundaries. Generally, the District is responsible for an area at the southern side of the City boundaries. Olympic pays Edmonds for treatment on a flow basis.



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 3.9 MLT Agrmt Area 11x17.mxd 4/4/2013 ctolentino

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City of Lynnwood - March 2011, Olympic View Sewer District 2007
City of Mountlake Terrace (MLT) - 2012, Ronald Wastewater District 2010

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NORTH

0 1,000 2,000 4,000 Feet

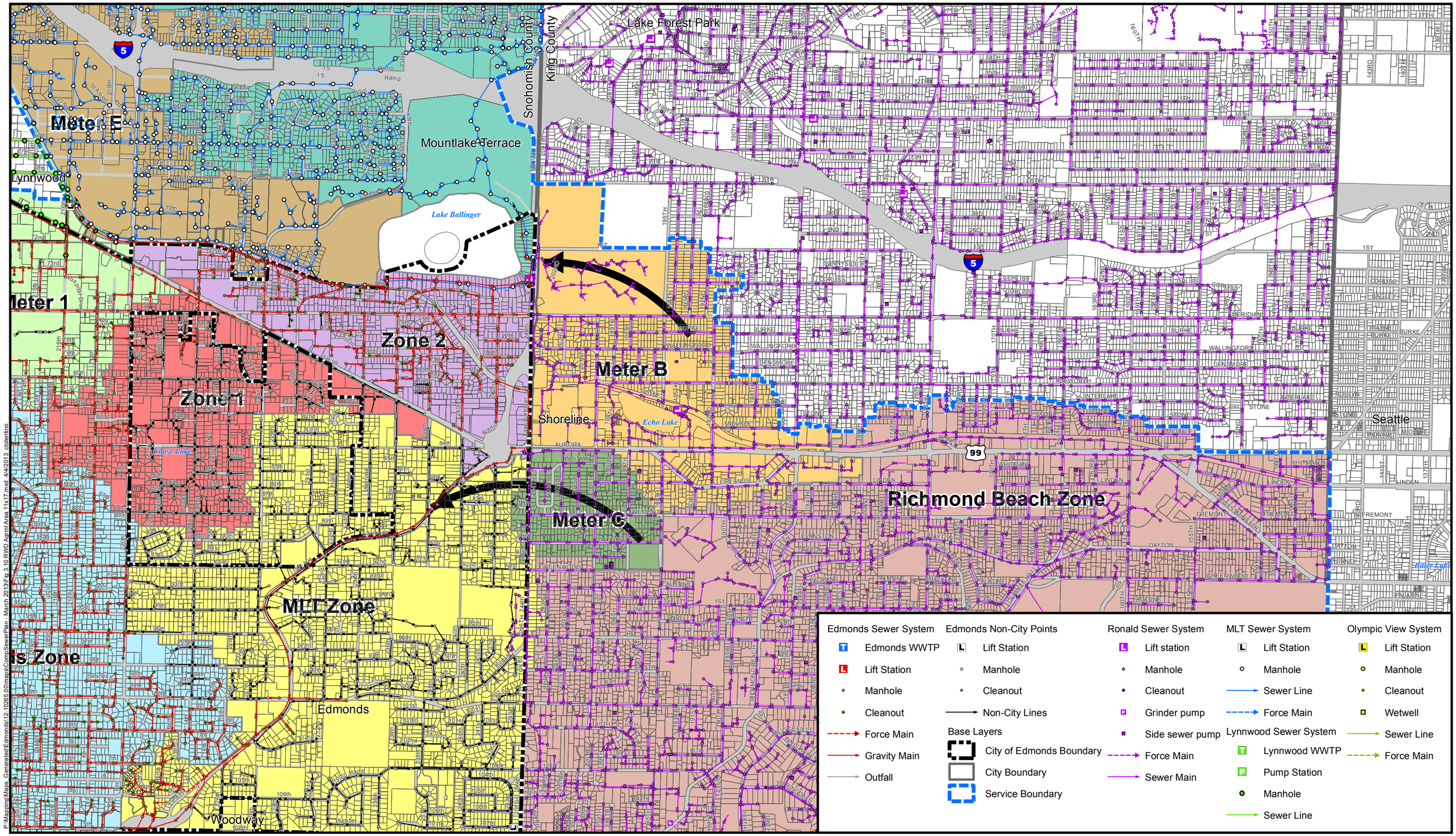
Scale in Feet

MOUNTLAKE TERRACE AGREEMENT AREA

COMPREHENSIVE SEWER PLAN

City of Edmonds
March 2013

Figure **3.9**



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 3.10 RWD Agrmt Area 11x17.mxd 4/4/2013 ctolentino

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Sewer System: City of Edmonds - December 2011
City of Lynnwood - March 2011, Olympic View Sewer District 2007
City of Mountlake Terrace (MLT) - 2012, Ronald Wastewater District 2010

GIS Base Data: City of Edmonds, Snohomish County & King County.
Data sources supplied may not reflect current or actual conditions.
This map is a geographic representation based on information available.
It does not represent survey data. No warranty is made concerning the accuracy, currency, or completeness of data depicted on this map.

NORTH

0 1,000 2,000 4,000 Feet

Scale in Feet

RONALD WASTEWATER DISTRICT AGREEMENT AREA

COMPREHENSIVE SEWER PLAN
City of Edmonds
March 2013

Figure **3.10**

CHAPTER IV – DESIGN CRITERIA

4.1 PERFORMANCE AND DESIGN CRITERIA

Sewer system design criteria and standards have been developed to maintain a consistent level of service throughout the City. These criteria and standards facilitate planning, design and construction of sewer system projects to achieve a predictable level of quality. These guidelines have been created to meet the increased need for sewer service in response to developments and population growth and the occasional updates to the land use regulations set forth by Cities or County.

The following is a partial list of criteria which affect sizing and siting of facilities. The City's design and construction standards are presented in the City's Standard Details and supplemental specifications modifications. Plans and design shall meet the "Criteria for Sewage Works Design," prepared by the Washington State Department of Ecology, as revised December 1998, except where more stringent City requirements are noted. These standards are to be followed unless otherwise approved by the City.

4.1.1 Sewer Mainline

- All sewer main extensions shall be designed and constructed to provide gravity service for all adjacent lots. In rare occasions where gravity service is not feasible the City may allow the use of individual grinder pumps for a limited number of connections. The design use and ownership of grinder pumps shall be per Section 4.1.5.

- Unless otherwise called for by the City, gravity sewers shall be constructed from PVC or concrete pipe. However, Ductile Iron or HDPE pipe materials may be required in certain applications. Pipe materials shall meet the following standards.

Material	Standard
Plastic – PVC	ASTM D3034-SDR 35 or F789
Concrete Class 2 (unreinforced)	ASTM C14 or AASHTO M 86
Concrete (reinforced)	ASTEM C76 or AASHTO M 170
Ductile Iron	AWWA C151
HDPE	ASTM D1248, Type III, Category 5, Class C, Grade P34 (See Section 2740)

- Ductile iron pipe (Class 52 DIP) and pipe anchors shall be required for all pipeline slopes of twenty percent (20%) and/or greater.

- Ductile iron pipe (Class 52 DIP) shall be required where the depth of cover is 15-feet or greater. Developers may request the use of PVC at depths greater than

15-feet. If so requested, the Developer shall certify the brand of pipe material to be used and he/she shall provide documentation that the pipe material is applicable to the soil conditions of the site and the proposed depth.

- Ductile iron pipe (Class 52 DIP) may be required where the depth of cover in traffic areas is less than 4 feet.

- All sewer pipes shall have 5- foot minimum cover in rights-of-ways and 3-foot minimum cover in all other areas.

- All pipes 8-inch and larger shall terminate at a manhole.

- Where a smaller diameter upstream pipe meets a larger diameter downstream pipe, the inverts at the manhole shall be determined by matching pipe crowns.

- Pressure sewer mains shall be ductile iron pipe or PVC meeting AWWA C-900.

- Minimum grade for 8-inch sewer mains shall be 0.5%, unless otherwise approved by the City's Engineer. Minimum grade for dead-end sewer mains that will not be extended shall be 0.75%, unless otherwise approved by the City's Engineer. Minimum grade and design criteria shall be in accordance with "Criteria for Sewage Works Design, State of Washington, DOE", unless City standards are more stringent.

4.1.2 Manholes

- Manhole numbers shall be obtained from the City.

- All sewer which are 8-inches and larger shall terminate in a manhole. All pipes entering/leaving a manhole shall be aligned with the center of the manhole unless otherwise authorized by the City.

- Manholes shall be 48" I.D. precast concrete, designed in accordance with the City's Standards and Details. All Manholes shall conform to ASTM C-478. Manhole frames and covers shall be locking type in accordance with City's Standards and Details and shall be supplied with stainless steel allen head cap screws. Manholes shall be a minimum of 5 feet deep unless otherwise approved by the City. See Standard Details 1 through 8.

- Inside drop manholes shall be 54" I.D (minimum) precast concrete and have a minimum drop structure of 5 feet.

- Where a drop manhole is required, the inside drop shall be per Detail No. E6.5 unless otherwise authorized or specified by the City.

- Manholes with incoming or outgoing sewer lines 15” or greater shall be 60” I.D. or greater, as directed by the City.

- Manholes shall have a minimum one-tenth of a foot (0.10 foot) drop at the center of the manhole.

- Manhole channels shall be shaped to allow placement and use of the City’s television inspection equipment. Channels shall be constructed at the full depth and diameter of mainline. Manhole shelves shall have slopes of ½ inch per foot. Channels and shelf shall be constructed plaster smooth.

- Manholes shall be placed at each grade and direction change. Distances between manholes shall not exceed 500 feet.

4.1.3 Side Sewers

- Side sewers laterals shall be constructed of SDR-35 PVC pipe, a minimum of 6-inches in diameter, and in accordance with ASTM D-3034. Installation shall follow Detail E6.4.

- The grade for 6-inch side sewer stubs shall be a minimum of two percent (2%).

- Approximate stub locations shall be shown on the plans.

- Cleanouts shall be used and placed over every side sewer at the property line.

- A side sewer stub shall be provided for each parcel on all new sewer extensions, regardless of whether the homeowner connects or not. The side sewer stub shall extend a minimum of 5-feet onto the property. The side sewer stub shall be located and terminate in accordance with Detail E6.4.

4.1.4 Pump Stations

Developers/Owners of developments that may require a pump station to provide sewer service shall contact the City regarding the design requirements of the station and the current City Pump Policies.

4.1.5 Individual Grinder Pumps

The use of individual grinder pumps to serve residential connections shall be limited to connections in which a gravity alternative is not feasibly possible. The City shall make the determination as to which connections qualify for service by grinder pump.

Grinder pumps shall meet the following standards.

1. Grinder pumps shall be owned and maintained by the property owner and shall only serve a single ERU.
2. Grinder pumps Systems shall be Zoeller 840 Series.
3. Minimum velocity for Grinder pump pipelines shall be 2.5 feet per second.
4. Pipelines shall be installed with cleanouts at the end of each line and at critical line size changes to facilitate cleaning.
5. Minimum storage volumes shall be 165 gallons. The Developer shall provided estimated flows to verify adequate storage capacity.

4.2 EASEMENTS

Easements dedicated to the City of Edmonds shall be provided for the construction, maintenance and operation of sewer mains or any other related City owned facilities which lie outside of public street right-of-ways. Easement documents shall be drawn up from the City's standard forms and shall include drawings and legal descriptions for each easement. Drawings and legal descriptions shall be signed and stamped by a Professional Land Surveyor, currently registered in the State of Washington.

Easements shall be a minimum of 15 feet in width, with the sewer located in the center of the easement. There shall be a separate easement provided for each lot that a sewer crosses.

Easements must be approved and received by the City prior to side sewer connection.

4.3 STANDARD DETAILS AND GENERAL NOTES

The City's Sample Plans, General Notes and Standard Details are provided in the Appendix I. The Sample Plans and Standard Details shall be considered during design and shall be followed during construction. At minimum a copy of the applicable manhole detail(s), the side sewer detail and the typical trench detail shall be included on all developer plans sets. Copies of additional individual details may also be required to be on the plans.

CHAPTER V - EXISTING FACILITIES

5.1 DRAINAGE BASINS

The City's service area is divided into different Sub-basins as identified on Figure 5.1. The sub-basins were originally delineated as part of the 2010 I&I Study by BHC Consultants, LLC. There are a total of 12 Sub-basins that either includes parts of the Edmonds corporate limits or areas that flow to and are treated by the Edmonds WWTP.

Sub-basins	In Edmonds City Limits	Flow to Edmonds WWTP	Flow to Lynnwood WWTP	Flows to King County
Meter 1	X	X		X
Zone 1	X	X		X
Zone 2	X	X	X	X
Meter A		X		X
Meter B		X		X
Meter C		X		
Meter E		X		X
MLT Zone	X	X		
Edmonds Zone	X	X		
LS #1	X	X		
Richmond Beach Zone		X		
Lynnwood Zone	X		X	

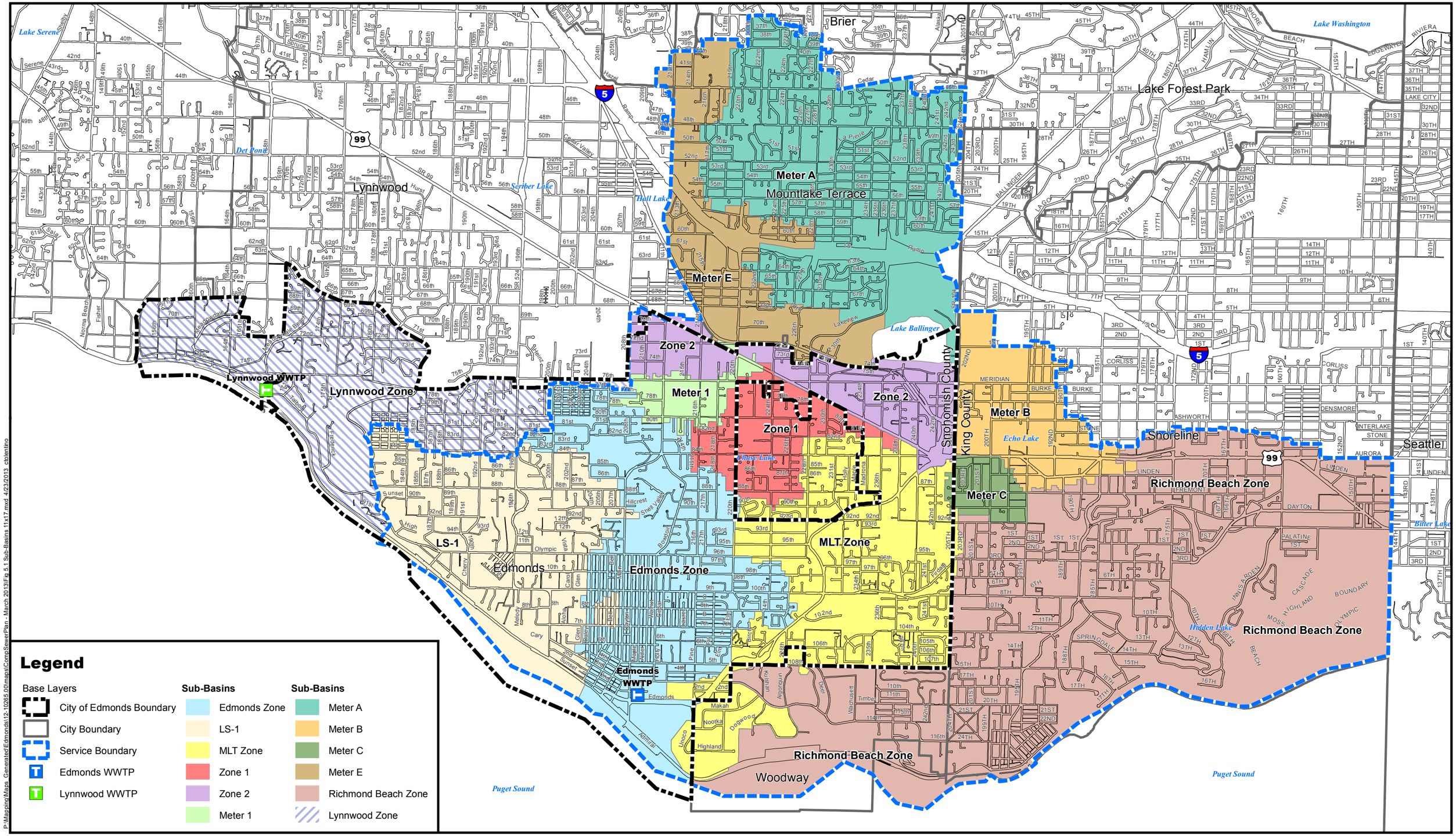
These Sub-basin boundaries are shown on Figures 5.1 and 5.2.

Sub-basins LS-1, Edmonds Zone, Meter C and the MLT Zone generally flow west towards Edmonds WWTP and Puget Sound. The Richmond Beach Zone Sub-basin is conveyed directly to the Edmonds WWTP where it is separately metered. Meter 1, Zone 1, Zone 2, Meter A, Meter B and Meter E generally flow to the south end of Lake Ballinger and are either pumped into the Edmonds System or to King County Metro. The Lynnwood Zone Sub-basin includes portions of the City, but is pumped to the Lynnwood WWTP. A more detailed description of each basin is included below.

The City operates ten different flow meters within the system. Sub-basin delineations are, for the most part, based on these meter locations. Relying on the flow data from these meters it is possible to identify flow in certain areas of the City. Similarly, per capita loadings and I&I contributions can be compared for each Sub-basin. This can be valuable information for identifying areas with high Inflow and Infiltration and for general information about the system.

5.1.1 Meter 1 Sub-basin

The Meter 1 Zone consists of approximately 160 acres and is located on the eastern edge of City of Edmonds municipal boundary.



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 5.1 Sub-Basins 11x17.mxd 4/23/2013 cblenino

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Snohomish County/King County base data.

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NORTH

0 1,600 3,200 6,400 Feet

Scale in Feet

CITY OF EDMONDS Inc. 1890

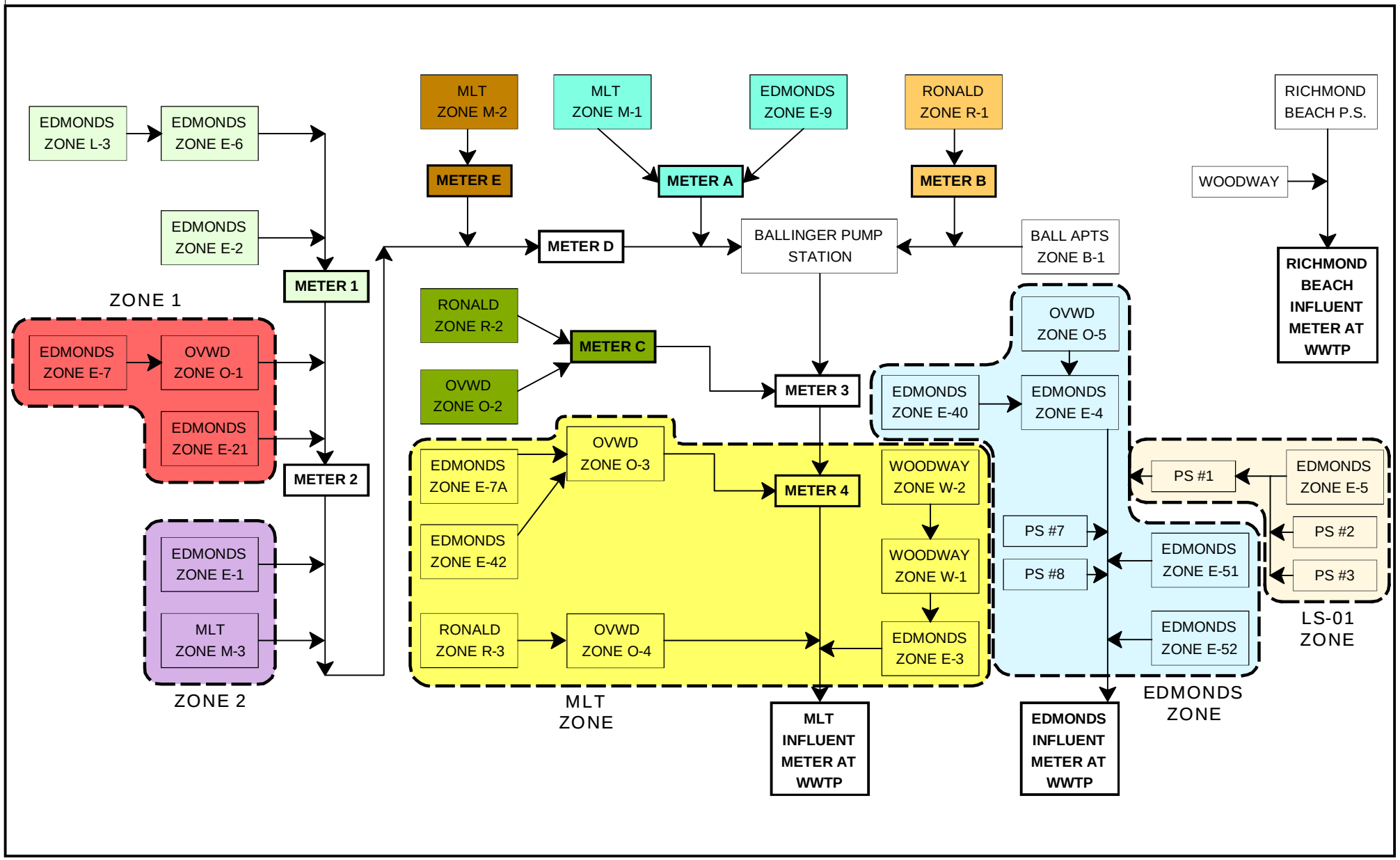
SUB-BASINS

COMPREHENSIVE SEWER PLAN
City of Edmonds
April 2013

Figure
5.1

FILE NAME (UPDATED BY)	PLOT DATE & TIME
S:\CAD\EDMONDS\12-10265 COMP SWR PLAN\DWGS\F12-10265_FLOW DIA.DWG (PLS)	APR 17 2012 11:32:43

XREFS: NONE



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Schematic Flow Diagram
Comprehensive Sewer Plan
Edmonds, Washington
April 2012

Figure
5.2

Generally, flow from this Sub-basin flows south towards Lake Ballinger and can be measured by the readings at meter 1.

5.1.2 Zone 1 Sub-basin

Zone 1 is comprised of approximately 324 acres and generally flows east to an outlet near SR 99. After it combines with flows from the Meter 1 Sub-basin, the flows are measured by meter 2. Therefore, Zone 1 Sub-basin flows can be measured by subtracting flow measured at meter 1 from meter 2.

5.1.3 Zone 2 Sub-basin

Zone 2 Sub-basin has approximately 525 acres and flows south towards the Lake Ballinger Pump Station. Flow from this area is combined with Zone 1 Sub-basin and Meter 1 Sub-basin. This combined flow joins with flow from Meter E Sub-basin before it flows through Meter D, immediately before the Lake Ballinger Pump Station. The flow in Zone 2 Sub-basin can be measured by subtracting both meter 2 and meter E readings from the meter D readings.

5.1.4 Meter A Sub-basin

Meter A Sub-basin is in Mountlake Terrace. Flow from this Sub-basin is directed toward the Lake Ballinger Pump Station. At that point the flow will either be pumped to the Edmonds system or to King County depending on the flow swap proportions. Meter A Sub-basin approximately 1,600 acres and all flow are measured at meter A.

5.1.5 Meter B Sub-basin

Meter B Sub-basin is comprised of approximately 555 acres and lies outside of the Edmonds corporate boundaries. For the most part, flows from Meter B Sub-basin flow through the Lake Ballinger Pump Station and are measured by meter B. The Ballinger Commons Apartments are part of this Sub-basin but are not routed through meter B.

5.1.6 Meter C Sub-basin

Meter C Sub-basin consists of approximately 143 acres and is largely located outside the corporate boundaries of Edmonds. Flows are combined with a small area in Olympic View Wastewater District and are measured through meter C.

5.1.7 Meter E Sub-basin

Meter E Sub-basin is comprised of approximately 663 acres and is located on west edge of the City of Mountlake Terrace, adjacent to the City of Edmonds municipal boundary. Flow from this Sub-basin is measured by flow meter E.

5.1.8 MLT Zone Sub-basin

The MLT Zone Sub-basin is comprised of approximately 1,575 acres. Sewage from this area generally flows northwest and to the City's WWTP. The MLT influent meter at the WWTP measures all flows exiting the MLT Zone Sub-basin plus upstream contributions. MLT Zone Sub-basin flows can be determined by subtracting meter 3 from the MLT influent meter.

5.1.9 Edmonds Zone Sub-basin

The Edmonds Zone is comprised of approximately 1,415 acres and lies directly east of the Edmonds WWTP. Flow from the Edmonds Zone is measured through the Edmonds Influent Meter at the WWTP. Since the LS #01 is tributary, it is necessary to subtract out LS #01 flows to estimate the flows originating in the Edmonds Zone Sub-basin.

5.1.10 LS-1 Zone Sub-basin

The LS-1 Zone Sub-basin lies at the north side of the Edmonds service area and is comprised of approximately 1,107 acres. There are three lift stations operating within this Sub-basin, stations 1, 2 and 3. All flows in this Sub-basin are pumped through Lift Station #1. This station, however, does not have a flow meter.

5.1.11 Richmond Beach Sub-basin

The Richmond Beach Sub-basin lies in the southwest corner of the City of Edmonds service area. It is comprised of 4,054 acres. All flow from the Richmond Beach Sub-basin is pumped through the Richmond Beach Pump Station and flows through the Richmond Beach Influent Meter at the WWTP. King County operates and maintains the Richmond Beach Pump Station as part of the 2000 agreement for reciprocal sewage treatment.

5.1.12 Lynnwood Zone Sub-basin

City of Edmonds has an agreement to send a portion of sewage within the Edmonds municipal boundary to Lynnwood WWTP for sewage treatment. This area is at the northeast corner of the Edmonds municipal boundary and is comprised of approximately 1,241 acres. Edmonds owns and operates six different lift stations within the Lynnwood Zone Sub-basin. Flow from this Sub-basin does not influence conveyance to and capacity at the Edmonds WWTP.

5.2 CITY COLLECTION AND CONVEYANCE FACILITIES

The City's inventory of gravity sewer lines totals approximately 680,000 linear feet of pipes ranging from 6-inches to 36-inches in diameter. This accounts for the City owned pipe only and not adjacent sewer adjacencies which own and operate the sewer infrastructure, and send flow to Edmonds for treatment. Table 5.1 below presents the summarized inventory of the City-owned piping systems.

Table 5.1
Summary of Pipe Inventory

Pipe Size	Total Length of City-owned Pipe (feet)
6-inch	19,678
8-inch	535,672
10-inch	34,145
12-inch	13,017
15-inch	9,612
18-inch	7,133
24-inch	21,937
30-inch	3,456
36-inch	3,237
Unknown	31,340
TOTAL	679,227 feet

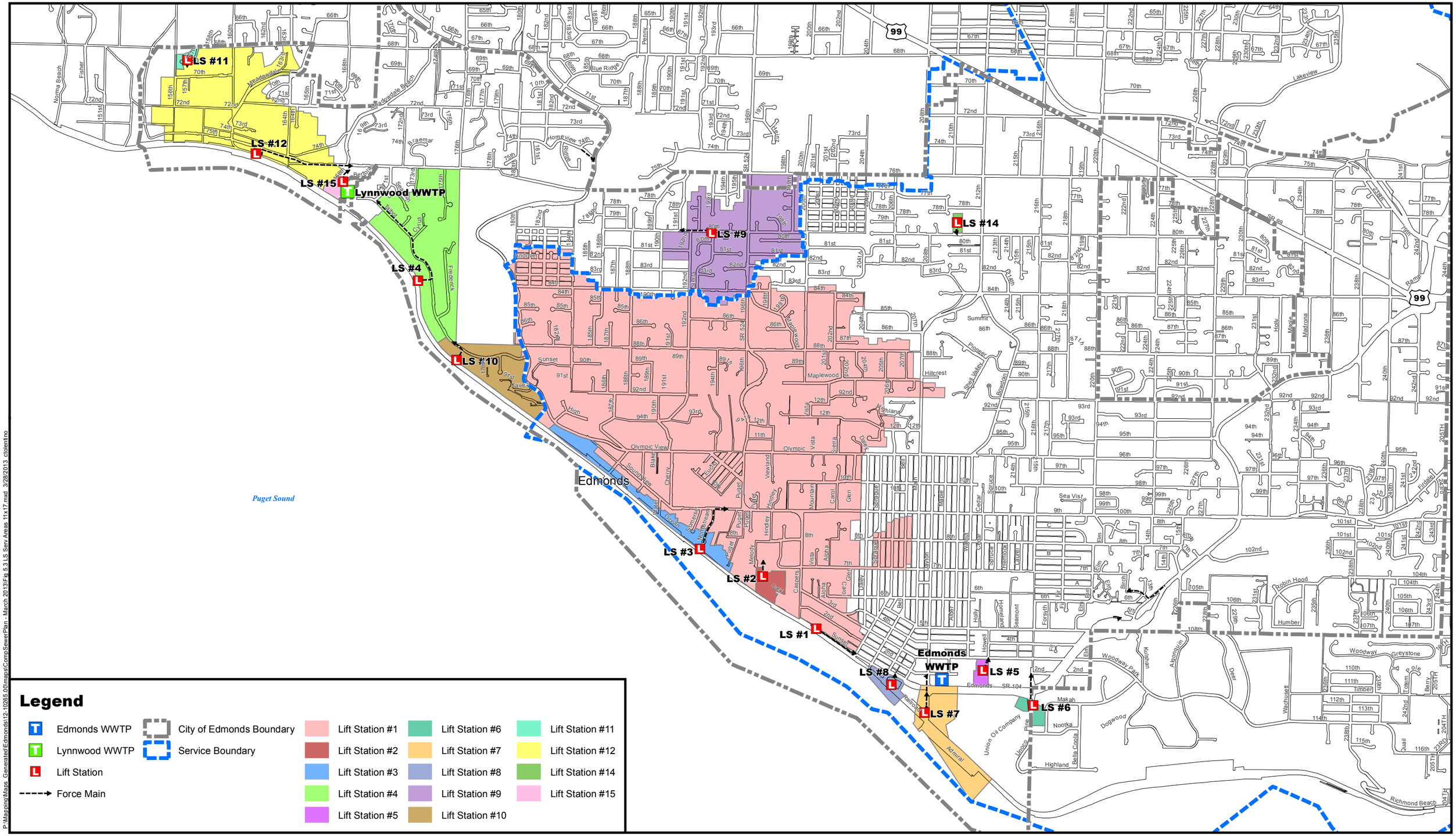
5.3 LIFT STATIONS

The City has a total of 14 active lift stations. Additionally, there are the Lake Ballinger Pump Station and the Richmond Beach Pump Station which are owned and maintained by King County. Several lift stations were upgraded in 2012. In addition, telemetry upgrades have been made at all of the lift stations. Most of the stations have alarm notifications which include: pump on/off; pump failure; power failure; high / low wet well level; generator run; operator in trouble; intrusion; and smoke detector.

Table 5.2 summarizes the Pump Station inventory as well as some of the operating conditions.

Figure 5.3 illustrates the relationship between each of the District's lift stations and give a representation of their location within the system.

Table 5.2 Pump Station Inventory						
Pump Station No.	Pump Type	Number of Pumps	Pump Manufacturer	Rated Capacity GPM @ TDH	Force Main Size and Type	PS Upgrades Year (if any)
1	Wet Well / Dry Well	2		1425 gpm @ 19 feet	10-inch AC & 12-inch DI	2002
2	Submersible	2	Hydromatic HPGFHX300	85 gpm @ 35 feet	3-inch DI	2011
3	Wet Well / Dry Well	2	4" Allis Chalmers	114 @ 94 feet	4-inch DI	2012
4	Wet Well / Dry Well	2	4" PACO	308 gpm @ 164 feet	6-inch DI	2012
5	Submersible	2	Hydromatic HPGX200CD	37 gpm @ 48 feet	2-inch HDPE	2012
6	Wet Well / Dry Well	2	4" Gormann Rupp	335 gpm @ 45 feet	6-inch DI	2005
7	Wet Well / Dry Well	2	6" Gormann Rupp	210 gpm @ 22 feet	4-inch PVC	2008
8	Wet Well / Dry Well	2	4" PACO	137 gpm @ 22 feet	4-inch DI	2008
9	Wet Well / Dry Well	2	2 - 4" WEMCO 2 - 5" WEMCO	332 gpm @ 38 feet	6-inch DI	2012
10	Wet Well / Dry Well	2	Hydromatic HPGFX	114 gpm @ 49 feet	4-inch DI	2012
11	Submersible	2	4" Gormann Rupp	95 gpm @ 73 feet	2-inch HDPE	2012
12	Wet Well / Dry Well	2	6" KSB	308 gpm @ 142 feet	6-inch DI	2012
14	Submersible	2	Hydromatic HPGX200CD	37 gpm @ 33 feet	2-inch HDPE	2012
15	Submersible	2	Hydromatic HPGHX500	42 gpm @ 60 feet	2-inch HDPE	2012



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\CompSewerPlan - March 2013\Fig 5.3 LS Serv Areas 11x17.mxd 3/28/2013 ctolentino

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Sewer Zones: City of Edmonds, December 2011
GIS Data: City of Edmonds, Snohomish County & King County.

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NORTH

0 1,000 2,000 4,000 Feet

Scale in Feet

LIFT STATION SERVICE AREAS

COMPREHENSIVE SEWER PLAN
City of Edmonds
March 2013

Figure
5.3

5.4 EDMONDS WWTP

5.4.1 General

The Edmonds Wastewater Treatment Plant (WWTP) provides wastewater treatment service for residential, commercial, and industrial customers for the City of Edmonds sewer service boundary. The facility was initially built in 1957 and has undergone several modifications, updates and expansions. In 1991 the Edmonds WWTP was upgraded from a primary plant to secondary plant. Currently the plant is rated to treat 11.8 mgd maximum month flow.

The plant is located at 200 2nd Ave South, Edmonds, WA, 98020.

The Washington State Department of Ecology regulates discharges to waters of the state through the National Pollutant Discharge Elimination System (NPDES) permit system. NPDES permits are developed based on federal and state water quality standards and treatment requirements.

The existing system is permitted under the NPDES discharge permit number WA-002405-8 (modified May 9, 2012). Effluent limitations are summarized in Table 5.3. The plant has been continuously compliant with these standards.

Table 5.3 Current NPDES Effluent Limitations for Edmonds WWTP Discharge

Parameter	Average Monthly Limits[1]	Average Weekly Limits[1]	Maximum Daily Limits[1]
Carbonaceous Biochemical Oxygen Demand (5 day BOD)	25 mg/L, 2460 lbs/day 85% removal of influent $CBOD_5$	40 mg/L, 3936 lbs/day	N/A
Total Suspended Solids (TSS)	30 mg/L, 2952 lbs/day 85% removal of influent TSS	45 mg/L, 4430 lbs/day	N/A
Fecal Coliform Bacteria	200/100 mL	400/100 mL	N/A
pH	Daily minimum ≥ 6.0 and daily maximum of ≤ 9.0		N/A
Total Residual Chlorine	191 µg/L	N/A	442 µg/L
[1]Current load limits are based on the Maximum Month Design Flow (MMDF) of 11.80 mgd.			

Biosolids (sludge) treatment and use are regulated under federal (40 CFR Part 503) and State (Chapter 173-308 WAC) regulations through the Statewide General Permit for Biosolids Management. Sludge from the Edmonds plant is dewatered using a belt filter press and incinerated using an on-site fluidized bed incinerator.

The plant has been compliant with the regulations for sewage sludge incinerators based on air emission limits established in Title 40 Part 503 of the Clean Water Act (CWA). The air emissions standards have recently been expanded by the EPA. On February 21, 2011, the EPA published their newest final SSI emission regulations in the Federal Register at Title 40 Part 60, under the provisions of the Clean Air Act (CAA), Section 129 “Solid Waste Incineration Units”. The new regulations were declared to be effective on May 20, 2011.

The previous and new air quality emission limits, how the plant's current emissions compare with the new standards and how the new regulations will affect the current incinerator equipment, operations and costs are discussed in Section 8.7.1.

5.4.2 Existing Wastewater Treatment Facilities and Loadings

The plant was originally constructed in 1957 and has been modified or upgraded several times since then. Table 5.4 summarizes the history of the WWTP.

Though the historical perspective of the improvements and modifications to the plant is interesting, the current infrastructure is really the important issue. The following sections describe the current facilities.

General: The current plant has a design maximum month flow of 11.8 mgd. The maximum month flow the plant currently treats is about 9.5 mgd. Flow is measured by three Parshall flume meters on the influent side of the WWTP and by an effluent meter.

Table 5.4
Edmonds WWTP Historical Improvements and Capacity

Project description	Date	Design Capacity		
		Maximum Month (mgd)	Average Annual (mgd)	Peak Hour (mgd)
Original Construction				
Grit removal, sewage grinding, primary settling, digestion, chlorination and outfall.	1957		2	
Improvements and Modifications				
Capacity Expansion	1959		4	
Two additional clarifiers, effluent pumping, sludge dewatering and incineration system. Removed grit and digestion.	1967		7.6	
Secondary Treatment	1991	11.8	9.1	40

Headworks

The headworks consists of three channels designated for measuring Edmonds, Mountlake Terrace, and Richmond Beach basin flows. Before the flow is measured with parshall flumes, three 4-foot wide mechanical bar screens with ¼-inch openings screens the influent. The flow then enters a wet well where four 100 hp vertical non-clog raw sewage pumps, each with a capacity of 9,260 gpm, the process flow though two 24" pipes to a primary influent splitter box. The splitter box gravity feeds the flow to the primary clarifiers.

Primary Clarifiers

Edmonds has three primary clarifiers. Two of the clarifiers are center fed square tanks 60 feet by 60 feet with a surface area of 3,600 square feet each. The third clarifier is rectangular, 91 feet long by 45 feet wide for a surface area of 4,095 square feet. The total surface area of the three primary clarifiers is **11,295** square feet.

The primary clarifiers provide quiescent conditions that reduces the flows velocity to the point that solids can be settled and removed. The clarifier also allows floatable material like plastics, oil, grease and scum to be skimmed off the surface and removed. Typically primary clarifier removals of the plant influent are 50 to 70 percent of suspended solids and 25 to 40 percent of BOD_5.

The primary sizing design criteria for clarifiers is the surface overflow rate, or the flow rate divided by the clarifier surface area; this is known as the vertical flow velocity. Typical design values for peak hourly flows are in the range of 2,000 to 3,000 gallons per day per square foot (gpd/sf). At 3,000 gpd/sf, the existing primary clarifiers would have a maximum performance-based capacity of 11,295 sf x 3,000 gpd/sf = 33.885 mgd.

Aeration Basins

After leaving the primary clarifiers, the liquid stream enters a channel that can flow to one of the three aeration basins. The three aeration basins are each 75.3 feet wide by 58 feet long and 20.6 feet deep with a total volume of approximately 673,000 gallons each (2.0 million gallons total). The aeration basins provide biological treatment by increasing the dissolved oxygen in the basin with fine bubble diffusers that disperse forced air. The oxygenated water encourages the growth of bacteria and microorganisms which consumes the waste flow's organic solids. When the process flow enters the aeration basins it first goes through a premix box where return activated sludge (RAS) from the secondary clarifiers mixes with the influent. The return sludge is the settled solids from the clarifiers and they are returned to increase the mixed liquor concentration and solids retention time (SRT) in the aeration basins.

Secondary Clarifiers

The secondary clarifiers are necessary for separating treated effluent from the mixed liquor solids leaving the aeration basins. The three circular clarifiers are 90 feet in diameter with a 17.5 foot side water depth which provide quiescent conditions for gravity sludge settling to occur. The mixed liquor from the aeration basin is fed into the center of the clarifier and flows outward to the effluent launders. The projected annual average surface overflow rate, in year 2033 is 306 gpd/sf and is far less than the average performance design of 550 gpd/sf.

The settled solids from the bottom of the clarifiers are the source for return sludge recycled back to the aeration basins. Secondary sludge pumps return the activated sludge from the clarifiers back to the to the individual premix boxes at each aeration basin. The waste activated sludge is wasted to a storage tank and then pumped to the belt presses for dewatering before incineration.

Chlorine Disinfection

The plant effluent is disinfected using liquid sodium hypochlorite (bleach). The sodium hypochlorite disinfection flash mix structure is provided to recombine effluent from the secondary clarifiers, however, current operation is to feed sodium hypochlorite at the secondary clarifier weir overflows which increases the contact time. The structure also provides 12.5% concentration sodium hypochlorite solution injection to the secondary effluent. Sodium hypochlorite is bought in bulk and stored at the facility in two 3,000 gallon tanks.

The purpose of the chlorine contact chamber is to provide a minimum of 20 minutes of detention time at peak hour flow rates, prior to discharge of the secondary effluent to the outfall, in order to allow the sodium hypochlorite solution time to react with the effluent. The current peak hour contact time using only the chlorine contact chamber is 14 minutes and is projected to be about the same in the year 2033. The practice of feeding sodium hypochlorite at the secondary weir overflow will continue.

The plant is meeting the current disinfection criteria by increasing the chlorination dose and then dechlorinating. The plant is able to control the chlorine residual through dechlorination by using bisulfate. The bisulfate is a 38% $NaHSO_3$ solution that when added to water releases sulfur dioxide which reacts with free chlorine and chloramines reducing effluent concentrations.

Sludge Dewatering

Primary and WAS is combined before dewatering and averages about 1.0% total solids. The dewatering equipment consists of two belt presses where one operates at a time from 12 to 24 hours a day depending on the Edmonds Plant sludge production. The dewatered sludge is fed to the onsite fluidized bed incinerator.

Incineration

From the belt presses, the dewatered sludge cake is deposited by a belt conveyor into a hopper that delivers the dewatered sludge to the fluid bed incinerator by a hydraulic pump. The fats, oils, and greases (FOG) are collected in the Primary Sludge Tank and are mixed with raw and WAS as feed to the belt presses. Large influxes of FOG are not desirable for incineration because their high fuel value makes temperature control more difficult.

Internally the incinerator has a reactor bed of sand that is fluidized by a controlled, pre-heated air supply that is blown through it. Here the dewatered sludge cake is fed into the fluidized sand bed where it is burned. In this bed the dewatered sludge is broken up by the sands fluidizing motion and is incinerated by the heat. Diesel fuel is pumped into the reactor to aid in combustion, as required. The amount of supplemental fuel required depends on the heat content of the combustion air (which is pre-heated by the primary flue gas heat exchanger), and the heat content of the sludge, which is dependent on the solids content of the dewatered sludge (% volatile solids). When the incinerator is operating at its design capacity with 27% dry solids (75% volatile), or greater, the incinerator should theoretically operate autogenously (thermally self-supporting), and supplemental fuel should only be required for start-up.

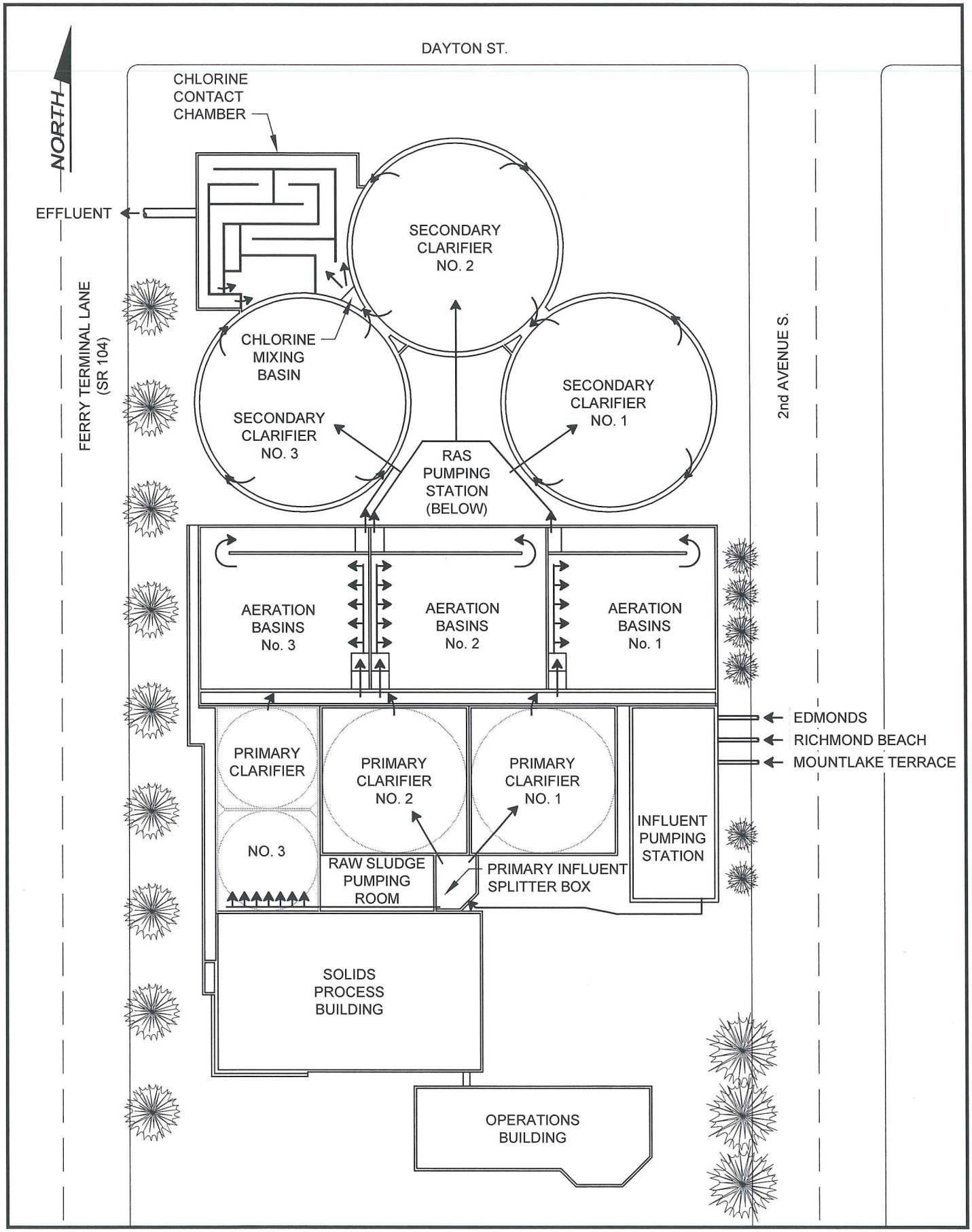
The incinerated sludge byproducts are gases and ash. The gases and ash exit the top of the incinerator and pass through a heat exchanger. The heat exchanger pre-heats the incinerator fluidizing air. The exhausted gas and ashes pass through a wet Venturi cyclone scrubber for particulate removal, followed by a wet tray scrubber where the finer particulate is removed and the gas is cooled by passing the scrubbed gas (which is re-heated with diesel fuel) counter-current to a large quantity of water. Combustion air is routed to the stack at about 10% of total combustion air to prevent a visible steam plume when it is released through a stack to the atmosphere.

The captured ash is thickened in a gravity thickener and dewatered in a vacuum filter. Current operations produce, on average, about 25 cubic yards of ash a week.

Plant Effluent

The treated and disinfected effluent is discharged approximately 1,250-feet off shore through a 36-inch outfall into Puget Sound. The outfall branches into two diffusers, each 160 feet long with diffuser ports at MLLW elevation that ranges from 56 to 73 feet deep.

A layout of the Edmonds WWTP is shown in Figure 5.4. Historical loadings and anticipated plant improvements are discussed in Chapter 8.



FILE NAME (UPDATED BY) S:\CAD\EDMONDS\12-10265 COMP SWR PLAN\DWGS\F12-10265_SITE LAYOUT.DWG (GOC)
PLOT DATE & TIME APR 04 2013 08:16:04
XREFS: NONE

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CITY OF EDMONDS Inc. 1890

WWTP Layout

Comprehensive Sewer Plan
Edmonds, Washington
May 2012

Figure **5-4**

5.5 Additional Regulatory Requirements

Substitute Secondary House Bill 1338 – Wastewater Reuse
While reuse of reclaimed wastewater treatment plant effluent is becoming more and more common, the demand for year-round reclaimed effluent in the Pacific Northwest is very limited, particularly in a suburban setting. To be acceptable for reuse, effluent must meet the quality standards specified in the state's Water Reclamation and Reuse Standards.

5.6 Infiltration and Inflow

The District maintains a pro-active approach to I and I reduction. In 1979, the City embarked on an aggressive program to reduce inflow by eliminating roof drain connections and other stormwater connections and by sealing manholes. Monitoring the peaking factors during large storm events in the 1980's and 1990's showed that the effort to reduce I&I appeared to be working. However, a storm in late January, 2006 raised new concerns. Flow measurements indicated higher than normal peaking factors and thus increased I&I for this storm. A 2010 I&I study was performed by BHC Consultants in order to address these concerns (see Appendix A). The study identified key areas within the system that are predicted to have higher I&I than other areas of the system. The areas and the efforts are explained further below:

5.6.1 Zone 1 Problem Area

The Zone 1 basin was predicted to have the highest I&I problems and is tagged as an area of concern. The prediction is based off of higher than normal peaking factors in gallons per acre day. It was recommended to T.V. inspect and smoke test areas within this basin to further identify the exact pipe sections and manholes that can be fixed.

5.6.2 LS-01 Zone

LS-01 Zone was predicted to have the second worse I&I problem out of all the sub-basins. Out of the three storm events, analyzed in the study, the peaking factor from average dry weather flow was over 5. The study recommends further T.V. inspection and smoke testing in the LS-01 zone to identify the exact lengths of pipe and manholes that need to be fixed.

5.6.3 MLT Zone

The MLT Zone was also identified as a higher than normal I&I area.

The City will continue to take a pro-active approach to reducing I&I in the system and therefore avoiding larger than normal flows at the plant during high precipitation storm events.

Chapter VI – EXISTING AND FUTURE POPULATION AND FLOW PROJECTIONS

6.1 POPULATION

6.1.1 General

Baseline population (Population 2010) estimates per Sub-basin were calculated using 2010 Census data. A residential density was calculated for each census tract based on current residentially zoned acreage, and that density was applied to the total residential acreage within each Sub-basin.

A further breakdown of the methodology used as well as resources can be found in Appendix C.

6.1.2 Existing Residential, Commercial and Student Populations

Table 6.1 identifies the eleven Sub-basins that flow to the Edmonds WWTP and the twelfth Sub-basin presented on Figure 5.1 is the Lynnwood Zone Sub-basin. Flows from this area are within the Edmonds City limits but are treated at the Lynnwood WWTP. For the purposes of this Comprehensive Plan, the flows from the Lynnwood Zone Sub-basin were analyzed and included the CIP.

The sewer generating categories were classified into residential population, employees and students. Existing population for each of these categories was available through Snohomish County or the Edmonds School District. There are portions of the Richmond Beach Sub-basin that are not sewered and that percentage is reflected in the sewered population values on Table 6.1. Other than these large tracts, it has been assumed that virtually all parcels are sewered. It is recognized, however, that there might be an occasional and isolated parcel that is not served. These isolated parcels constitute a small percentage and are reflected in Table 6.1. All commercial (i.e. employees) and student populations were counted as sewered. There are no industrial dischargers to the Edmonds system.

Historical and textbook values of domestic wastewater (i.e. little or no I/I contribution) assigned to residential customers are typically found to be between 50 and 60 gals per capita per day (gpcd). Students and employees are generally found to be a fraction of the contribution of a full time resident. Historical values for students have been found to range from 10 to 15 gallons per student per day. Textbook values per employee can vary broadly depending on the nature of the commercial use. The typical per employee contribution ranges from 15 to 25 gallons per employee per day. This range is consistent with the values used by both the Alderwood Water and Wastewater District's Comprehensive plan dated 2009 and the City of Lynnwood's Comprehensive Plan dated 2012.

Based on these values, a ratio for students and employees was established so a population equivalence could be developed. Five students generate the same volume of wastewater as a full time resident, or a 5 to1 ratio for students. Similarly, a 3 to 1 ratio is

expected for employees.

The development of the Population Equivalence (see Table 6.1) was based on these ratios. This means that a resident living in the Sub-basin would be counted as one and all students would be counted as 20% and all employees would be counted as 0.33 people. This formula was applied to the population, employees and students to determine the Population Equivalent.

Table 6.1
City of Edmonds - Existing Population 2010

Sub-Basins	Population		Employment	Student Population	Population
	Total Population	Total Sewered Population	Total Employment (1)	Total Population (2)	Equivalent (#)
Meter 1	1,788	1,788	1,535	1,722	2,644
Zone 1	2,686	2,686	592	378	2,959
Zone 2	4,835	4,815	4,585	0	6,342
Meter A	12,075	12,075	1,657	1,691	12,965
Meter B	4,473	4,249	2,664	450	5,226
Meter C	1,486	1,412	182	0	1,472
Meter E	5,828	5,537	5,367	1,372	7,598
MLT Zone	10,626	10,095	1,604	1,177	10,864
Edmonds Zone	10,790	10,790	3,558	503	12,075
LS #1	6,410	6,090	508	1,181	6,495
Richmond Beach Zone	19,755	17,037	7,528	17,617	23,067
Lynnwood Zone	6,528	6,202	509	0	6,371

Notes
1. The ratio of flow per employee to flow per resident is assumed to be 1:3 (DOE, Criteria for Sewage Works Design - Orange Book).
2. The ratio of flow per employee to flow per resident is assumed to be 1:5 (DOE, Criteria for Sewage Works Design - Orange Book).

These population numbers were assigned to the geographic Sub-basin. Furthermore, forecasted values of population, employment and students also followed these Sub-basin boundaries.

6.1.3 Future Residential, Commercial and School Populations

The task of this Plan is to evaluate the performance of the sewer collection, conveyance and treatment components for baseline (existing), 6-year, 20-year and build out scenarios. To evaluate the conditions on these target years, the Plan determined the residential, commercial and student populations for the years 2019, 2033 and build out.

Various sources of data were used to estimate these populations and employment

figures. These sources include the following:

- 2010 Census Data, by Census Block
- 2010 Covered Employment Estimates, Washington State Employment Security Department, provided as custom estimates via PSRC
- 2008-2010 Three-Year American Community Survey, Self-Employment Estimates for Edmonds
- Office of Financial Management, Population Estimates for 2011 and 2012
- Snohomish County 2012 Buildable Lands Report
- Snohomish County Draft Initial Growth Targets for 2035
- King County 2007 Buildable Lands Report
- City of Shoreline Comprehensive Plan Land Use and Buildable Lands Capacity Update, 2012
- Shoreline Community College Unduplicated Annual Head Count
- Edmonds School District Update of Long Range Enrollment Projections 2012 to 2032
- Conversations regarding local long-range planning efforts with City Staff in Edmonds, Shoreline, and Mountlake Terrace; the Snohomish County Demographics Team; and staff and facility planners at school districts and at individual schools.

The population was then distributed to the 12 Sub-basins, described earlier, so the hydraulic model could be define that infrastructure that was at or approaching its maximum capacity.

The City of Edmonds service area spans two counties and serves several cities or Special Service Districts. Consequently, there were several document sources that were used to determine the future population/employees.

Residential population baselines have been established for each Sub-basin based on Census data. Employment baselines have been established for each Sub-basin from PSRC custom estimates for State-reported Covered Employment; self-employment estimates have been added to calculate baseline total employment for each Sub-basin.

The Richmond Beach Zone Sub-basin straddles the Snohomish-King County boundary. For the purpose of these forecast estimates, two separate evaluations, prepared for the portions of the Richmond Beach Zone Sub-basin in each County, have been added together to compute a final estimate for the entire Sub-basin for each target year.

King County Population and Employment Forecast. King County forecast estimates are based on the 2007 Buildable Lands Report, for Shoreline's primarily residential zoning, and on the 2012 Update to the Shoreline Comprehensive Plan, which included updated population and employment capacity estimates specifically along the Aurora/Highway 99 Corridor. The City of Shoreline is planning for significant increases in development along this corridor, impacting population and employment Richmond Beach Zone Sub-basin, Meter C Sub-basin, and Meter B Sub-basin. The 2031 horizon for this report has been used as an interpolation point from which to estimate forecasts for the target yeas; this interpolation has been extended to estimate a build out scenario as well.

Snohomish County Population and Employment Forecast. Snohomish County 6-year population forecast estimates are based on the 2012 Buildable Lands Report, which offers detailed capacity analysis based on both underlying city zoning and market trends.

The 20-year estimates are based on the County's 2035 Initial Growth Targets, aspirational estimates which are to be adopted into the countywide planning policies; these will assist with the next GMA-mandated round of comprehensive plan updates. However, Edmonds City Staff feels that these Initial Growth Targets are based on past market trends and do not account for a potential market shift favoring the significantly more dense, multi-story, mixed use development currently permitted in the zoning along Highway 99. The City of Edmonds has loosely approximated additional population and employment in selected sub-basins in order to approximate the scenario within which market conditions favor a shift towards this additional density along Highway 99 sometime within the next 20 years.

The 2035 horizon for the Initial Growth Targets has been used as an interpolation point from which to extend forecast estimates out to a build out scenario for residential population. The employment capacity expressed in the 2012 Buildable Lands Report, with market reductions removed, stands in as the data point for the estimated employment buildout scenario

Student Enrollment Baselines and Forecast Estimates

Individual Schools and School Districts have been surveyed to gather baseline enrollment statistics. The Edmonds School District provided a long-range forecast report recommending consideration of a medium-growth scenario throughout the school district. These growth rates have been applied to the District schools within the Service Area. Private schools are generally assumed to retain stable student enrollment populations through time, and none within the Service Area reported plans for major expansions. Shoreline Community College, with no major plans for facility expansion, also expects a relatively stable on-campus student population in the future; anticipated increases in enrollment are likely to be offset by concurrent increases in student participation in distance learning programs.

The summary of this analysis is presented in Table 6.2.

6.2 FLOWS

6.2.1 General

Edmonds is fortunate to have ten functioning and reliable flow meters. These flow meters are presented schematically on Figure 5.2. An eleventh flow meter (Meter 4) has not been maintained or calibrated. Consequently, this data is not available or is thought to be unreliable.

Table 6.2
City of Edmonds - Population and Growth Projections

Sub-Basins	2019					2033					Buildout				
	Total Population	Total Sewered Population	Sewered Employment	Sewered Students	Population (1) Equivalence	Total Population	Total Sewered Population	Sewered Employment	Sewered Students	Population (1) Equivalence	Total Population	Total Sewered Population	Sewered Employment	Sewered Students	Population (1) Equivalence
City of Edmonds															
Meter 1	1,867	1,867	1,567	1,745	2,738	2,361	2,361	1,616	1,943	3,288	4,017	4,017	1,677	2,410	5,057
Zone 1	2,908	2,908	751	383	3,235	3,413	3,413	999	427	3,831	4,754	4,754	981	529	5,186
Zone 2	5,280	5,280	5,088	0	6,974	6,691	6,691	5,870	0	8,646	10,874	10,874	6,507	0	13,041
Meter A	13,597	13,597	2,221	1,710	14,679	15,417	15,417	3,097	1,877	16,824	18,438	18,438	4,171	2,268	20,281
Meter B	6,471	6,471	3,714	440	7,796	11,056	11,056	5,347	443	12,925	20,880	20,880	8,847	450	23,916
Meter C	1,775	1,775	332	0	1,886	2,413	2,413	565	0	2,601	3,811	3,811	1,065	0	4,166
Meter E	6,170	6,170	5,674	1,390	8,337	6,579	6,579	6,152	1,548	8,937	7,258	7,258	6,738	1,920	9,886
MLT Zone	11,414	11,414	1,721	1,191	12,225	12,356	12,356	1,904	1,313	13,253	13,920	13,920	2,128	1,599	14,948
Edmonds Zone	11,752	11,752	3,842	509	13,133	12,901	12,901	4,284	561	14,440	14,810	14,810	4,826	685	16,554
LS #1	6,631	6,631	511	1,197	7,041	6,895	6,895	516	1,333	7,333	7,333	7,333	523	1,653	7,838
Richmond Beach Zone	24,933	22,440	9,232	15,540	28,622	34,430	32,709	11,883	16,347	39,935	54,141	54,141	17,486	17,817	63,527
Lynnwood Zone	6,754	6,754	514	0	6,925	7,024	7,024	521	0	7,197	7,473	7,473	531	0	7,650

1. The ratio of flow per employee to flow per resident is assumed to be 1:3 and ratio of 1:5 for students (DOE, Criteria for Sewage Works Design - Orange Book).

Flow data from these ten meters was collected from July 2006 through November 2012. A graphical representation of this flow data is presented in Appendix B. In order to capture different flow scenarios four flow conditions were graphed. These four flow conditions were the Average Dry Weather, Average Daily, Average Wet Weather and Maximum Month. Graphical presentation of the Peak Day and Peak Hour was not viewed as meaningful. Total daily flow data for this six and half year period was evaluated.

- **Average Dry Weather Flow** – This flow condition is defined as the average daily flow for the months of July through October when no rainfall was recorded. As expected, the flow was very stable during this period. Any day with measureable rainfall was excluded from the data set. The intent of presenting this data is to capture the base domestic flow conditions with neither infiltration nor inflow.

- **Average Daily Flow** – This flow condition captured all daily flows during the year. The average of all these flows would be considered the annual average flow.

- **Average Wet Weather Flow** – This flow condition is defined as the average daily flow from the months of November through March. All flows during this period were analyzed regardless of the amount of precipitation. The value of this data set was to understand the I&I contribution to the system.

- **Maximum Month Flow** – The Maximum Month Flows are of particular interest for the WWTP. Since the NPDES permit is written with monthly discharge limitations, treatment plants are typically designed with this flow condition as the design flow. The determination of this value was based on the highest monthly average flow.

- **Peak Day Flow** – The Peak Day Flow is the maximum total daily flow recorded at the meters during a 24-hour period. In December 2006 and December 2007, the area experienced an abnormally high rainfall event. This translated to record flows at the ten meters and at the WWTP. These rainfall events have not been replicated since that time.

- **Peak Hour Flow** - Peak Hour Flow is defined as the peak sustained flow rate occurring during a one-hour period. It is typically used to size the collection and interceptor sewers, pump stations, piping, flow meters, and certain physical WWTP processes. The Peak Hour flows were determined from two factors: 1) the addition of diurnal flow patterns which were developed from 5-minute flow data for the year 2009 (see Figure 6.1) and 2) the peaking factor between peak day and peak hour which was derived from 5-minute data.

6.2.2 Recorded Flows

The graphical presentation of the flow data starting in July 2006 through November 2012 is displayed in Appendix B and summarized on Table 6.3. It is meaningful to evaluate the entire period to understand the growth or trending during this six and half year period. However, averaging this entire time period was not representative of the current day flows. There are several factors that are effect the flow patterns at the meters. These

include:

- City pipeline rehabilitation projects
- New sewer line extensions
- New customers and connections
- Degradation of the pipelines. King County has concluded from their studies that there is a 7% degradation of the pipe, and hence a 7% increase in I&I, every decade.

Viewing the flow graphs for this period, it appears that these factors are offsetting. There is not any trending patterns over the period. This is perhaps understandable since much of the service area is built out and largely sewered. Consequently, flow data for the years 2010 through 2012 were used to capture the current conditions.

The components of wastewater flow evaluated include: Average Dry Weather Flow (ADWF), Annual Average Daily Flow (AAF), Average Wet Weather Flow (AWWF), Maximum Month Flow (MMF), Peak Day Flow (PDF) and Peak Hour Flows. A summary of the flow events was derived by summing the flows from the three influent meters (MLT, Edmonds and Richmond Beach) at the WWTP for the period of 2010 through 2012. It should be noted that these values are not necessarily the peak recorded flows for the plant. Significant storm events in 2007 and 2009 resulted in flows in excess of that which is presented below:

Current Influent Flows[1]

	Edmonds WWTP
Average dry weather flow (ADWF)[2], mgd	3.97
Annual average flow (AAF), mgd	5.82
Average wet weather flow (AWWF)[3], mgd	7.52
Maximum month flow (MMF)[4], mgd	9.66
Peak day flow[5] (PDF), mgd	21.65
Peak wet weather flow[6] (PWWF), mgd	27.5

Notes:

1. Values represent flow events from 2010 to 2012.
2. ADWF is defined as the average of the days with zero rainfall during four dry weather months (July through Oct) for years 2010 to 2012.
3. AWWF is defined as the average of five wet weather months (November through March) for years 2010 to 2012.
4. Maximum month flow (MMF) is the average flow for the maximum month, as defined in the current NPDES permit. The MMF is sometimes referred to as peak month flow and is considered the design flow for the WWTP.
5. Peak Day Flow is from wet weather event on 12/12/2010. It should be noted that the historical high daily flow of 23.84 mgd was recorded on 12/3/2007.
6. PWWF is an estimate value using the peak hour to peak day ratio seen from the December 3, 2007. This factor was approximately 1.27. It should be noted that the historical high peak flow of 30.26 mgd was recorded on 12/3/2007.

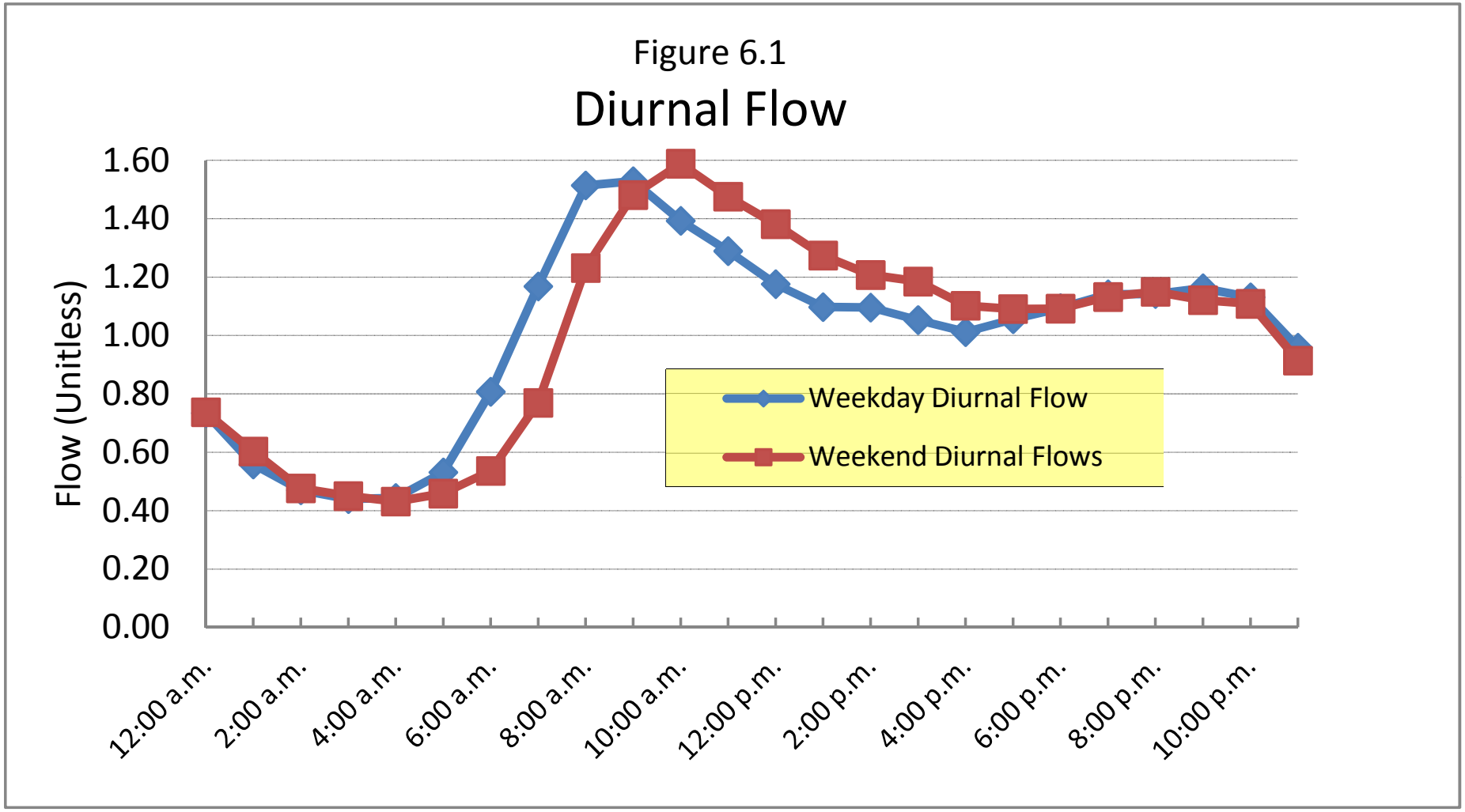


Figure 6.1
Diurnal Flow
Flow (Unitless)
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
12:00 a.m.
2:00 a.m.
4:00 a.m.
6:00 a.m.
8:00 a.m.
10:00 a.m.
12:00 p.m.
2:00 p.m.
4:00 p.m.
6:00 p.m.
8:00 p.m.
10:00 p.m.
Weekday Diurnal Flow
Weekend Diurnal Flows

Table 6.3
City of Edmonds - Measured Flows by Meter

Meters	Sub-basins	Size in Acres	Population Equivalent (5)	Average Dry Weather (1)		Average Daily Flow (2)		Average Wet Weather (3)		Maximum Month (2)		Peak Day (2)	
				Flow mgd	Flow per Equivalent	Flow mgd	Flow per Equivalent	Flow mgd	Flow per Equivalent	Flow mgd	Flow per Equivalent	Flow mgd	Flow per Equivalent
Meter 1	Meter 1	161.0	2,644										
	Total Meter 1	161.0	2,644	0.140	53	0.161	61	0.173	65	0.225	85	0.555	210
Meter 2	Zone 1	324.3	2,959										
	Meter 1	161.0	2,644										
	Total Meter 2	485.3	5,603	0.249	44	0.335	60	0.422	75	0.605	108	1.74	311
Meter A	Meter A	1602.4	12,965										
	Total Meter A	1602.4	12,965	0.703	54	0.974	75	1.214	94	1.602	124	3.723	287
Meter B	Meter B	555.0	5,226										
	Total Meter B	555.0	5,226	0.257	49	0.304	58	0.352	67	0.448	86	1.33	254
Meter C	Meter C	143.3	1,472										
	Total Meter C	143.3	1,472	0.076	52	0.115	78	0.147	100	0.215	146	0.646	439
Meter D	Meter E	663.0	7,598										
	Zone 2	525.5	6,342										
	Zone 1	324.3	2,959										
	Meter 1	161.0	2,644										
	Total Meter D	1673.8	19,543	1.250	64	1.449	74	1.628	83	1.949	100	4.293	220
Meter E	Meter E	663.0	7,598										
	Total Meter E	663.0	7,598	0.498	66	0.563	74	0.617	81	0.896	118	2.441	321
Meter 3	Meter C	143.3	1,472										
	Meter B	555.0	5,226										
	Meter A	1602.4	12,965										
	Meter E	663.0	7,598										
	Zone 2	525.5	6,342										
	Zone 1	324.3	2,959										
	Meter 1	161.0	2,644										
	Total Meter 3	3974.5	39,206	1.031	26	1.937	49	2.911	74	3.665	93	5.273	134
MLT at WWTP	MLT Zone	1573.9	10,864										
	Meter C	143.3	1,472										
	Meter B	555.0	5,226										
	Meter A	1602.4	12,965										
	Meter E	663.0	7,598										
	Zone 2	525.5	6,342										
	Zone 1	324.3	2,959										
	Meter 1	161.0	2,644										
	Total MLT at WWTP	5548.4	50,070	1.500	30	2.560	51	3.576	71	4.398	88	7.826	156
Edmonds	Edmonds	1415.8	12,075										
at WWTP	LS-01 Zone	1106.6	6,495										
	Total Edmonds at WWTP	2522.4	18,570	1.406	76	1.715	92	1.982	107	2.455	132	6.22	335
Richmond B		4054.4											
at WWTP	Total RB at WWTP	4054.4	23,067	1.060	46	1.542	67	1.967	85	2.803	122	7.601	330

(1) Average Dry Weather Flow is defined as the average daily for months of July through October with days of zero rainfall for years 2010 - 2012.

(2) Flow Data obtained from City provided information. Consolidated from monthly Discharge Monitoring Reports (DMR's), for years 2010 - 2012.

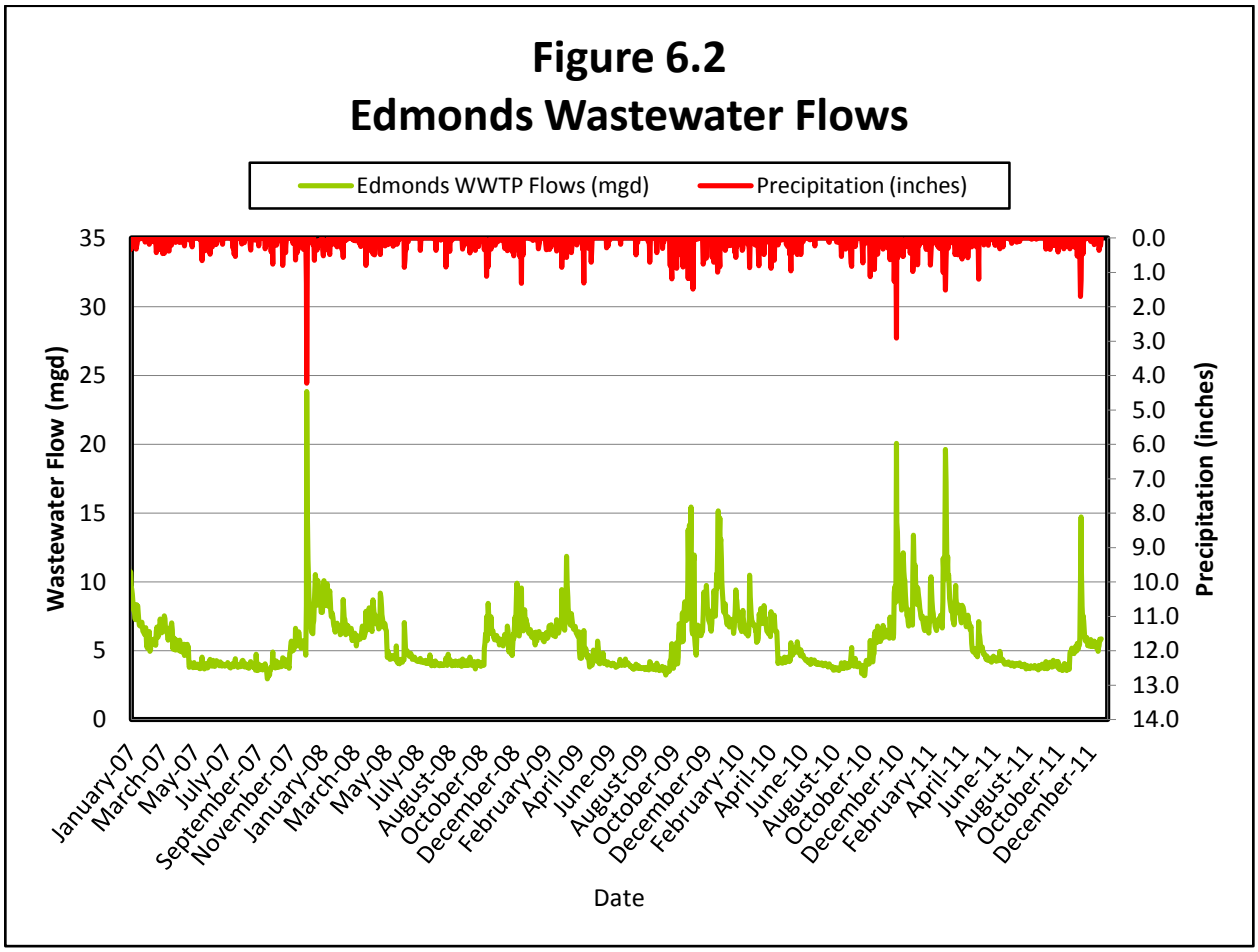
(3) Average Wet Weather Flow is defined as the average flow from the months of November through March for years 2010 - 2012.

(4) Peak Hour data derived from Peak day x 1.27 peaking factor at the WWTP which accounts for the diurnal flow patterns plus the peak storm event

(5) Population Equivalent is 2010 values see Table 6.1

A graphical presentation of flow at the WWTP for the period of record (2007 through 2012) is presented in Figure 6.2. A visual comparison of the 2007 and 2010 storm events is evident.

The flow per population equivalent as presented on Table 6.3, shows some slight variability in the values. In particular, the data measured in Meters 3 and the MLT meter at the WWTP reflects per population equivalent values that are unusually low. However, these two meters are downstream of the flow diversion to King County and consequently reflect lower total flows coming into the Edmonds system. This explains the low per population equivalent values seen at these two meters.



6.2.3 Estimated Future Flows

The application of the appropriate per population equivalent value is the basis for the future flow projections. With differing demographics and residential/commercial composition, each Sub-basin will have different per equivalent contribution. Therefore, it is recommended that the derived values be applied for the future growth conditions as presented below:

- Sub-basin Meter 1 – use values from Meter 1

- Sub-basin Zone 1 – use values from Meter 2
- Sub-basin Zone 2 – use values from Meter 2
- Sub-basin Meter A – use values from Meter A
- Sub-basin Meter B – use values from Meter B
- Sub-basin Meter C – use values from Meter C
- Sub-basin Meter E – use values from Meter E
- Sub-basin MLT Zone – this sub-basin is influenced by the flow swap. The determination of the appropriate flows can be reach by either subtracting the Meter 3 data from the MLT meter data or by using data from a non-subtraction meter such Meters A, B, C or E. Subtracting Meter 3 data from MLT meter results in data that is very close to Meter B flow data. Therefore, the forecast has used values from Meter B.
- Sub-basin Edmonds Zone – use Edmonds meter at the WWTP
- Sub-basin LS#1 – use Edmonds meter at the WWTP
- Sub-basin Redmond Beach Zone – use Richmond Beach meter at WWTP
- Sub-basin Lynnwood Zone – this Sub-basin flows to the Lynnwood WWTP. The only flow records available for this Sub-basin are from the single effluent flow meter at the WWTP.

The per population equivalent values used on Tables 6.4, 6.5 and 6.6 originate from the corresponding values in Table 6.3, as noted above, and have a 7% per decade pipe degradation factor for the increased I/I.

The 7% factor is applied to the I/I component for all the flow scenarios except the Average Dry Weather Flows, which by definition, has little or no I/I contribution.

6.3 WWTP FLOWS

Comparing historical flows with forecasted flows requires an understanding of the King County Interlocal Agreement. Historically, as described in Section 3.4.2, a seasonal flow swap with King County was executed that sent all winter and spring flows from both Richmond Beach and the flows at the Lake Ballenger PS to Edmonds. The summer flows were swapped such that the volumetric flows from Richmond Beach were directed to King County. Effective in 2012, the agreement calls for all flow throughout the entire year to be swapped with King County. This means that the total volume of wastewater received by Edmonds will be reduced.

Consequently, the WWTP flow projections reflect this change in operation. Table 6.7 presents the forecasted flows at the WWTP. These flows are the basis for the WWTP loadings shown on Table 8.1

Table 6.4
2019 Flow Projections

Sub-Basins	Population Equivalence (1)	Average Dry Weather		Average Daily		Average Wet Weather		Maximum Month		Peak Day	
		Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)	Population Equivalent (2)	Sewer Flow (gpd)	Population Equivalent (2)	Sewer Flow (gpd)
Meter 1 (3)	2,738	53	144,977	61	167,637	66	180,586	86	236,696	217	592,781
Zone 1 (4)	3,235	44	143,520	60	195,495	77	247,830	111	357,916	322	1,040,686
Zone 2 (5)	6,974	44	309,444	60	421,506	77	534,347	111	771,703	322	2,243,825
Meter A	14,679	54	795,916	76	1,115,621	95	1,398,754	126	1,856,486	297	4,358,676
Meter B	7,796	49	383,374	59	456,429	68	531,040	87	680,260	263	2,051,222
Meter C	1,886	52	97,352	79	149,407	102	192,119	150	282,882	455	858,159
Meter E	8,337	66	546,466	74	620,787	82	682,531	120	1,001,542	332	2,768,108
MLT Zone (6)	12,225	49	601,206	59	715,771	68	832,775	87	1,066,782	263	3,216,721
Edmonds Zone	13,133	76	994,360	93	1,222,071	108	1,418,831	135	1,767,399	346	4,541,938
LS #1 (7)	7,041	76	533,066	93	655,139	108	760,620	135	947,484	346	2,434,885
Richmond Beach Zone	28,622	46	1,315,255	68	1,938,442	87	2,487,933	125	3,568,814	341	9,772,245
Lynnwood Zone (8)	6,925	76	524,316	93	644,386	108	748,136	135	931,932	346	2,394,919

Notes

1. Values from Table 6.2
2. Value derived from Table 6.3 as modified in Section 6.2.3. An additional allowance of 7% per decade is applied to account for the increased the I/I component
3. The values used for Sub-basin Meter 1 are from Meter 1 flow data
4. The values used for Sub-basin Zone 1 are from Meter 2 flow data
5. The values used for Sub-basin Zone 2 are from Meter 2 flow data
6. The values used for Sub-basin MLT Zone are from Meter B flow data
7. The values used for Sub-basin LS#1 are from the Edmonds Meter at the WWTP
8. No Flow data available for Lynnwood Zone, therefore use Edmonds Meter at WWTP

Table 6.5
2033 - Flow Projections

Sub-Basins	Total Population Equivalence (1)	Average Dry Weather		Average Daily		Average Wet Weather		Maximum Month		Peak Day	
		Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)
Meter 1 (3)	3,288	53	174,100	62	203,871	67	220,883	90	294,602	232	762,433
Zone 1 (4)	3,831	44	169,981	62	237,328	80	305,142	117	447,787	348	1,332,495
Zone 2 (5)	8,646	44	383,615	62	535,605	80	688,649	117	1,010,571	348	3,007,191
Meter A	16,824	54	912,230	78	1,313,118	99	1,668,148	133	2,242,113	320	5,379,691
Meter B	12,925	49	635,623	59	768,139	70	903,474	91	1,174,146	283	3,660,939
Meter C	2,601	52	134,298	82	212,863	107	277,326	159	414,310	493	1,282,548
Meter E	8,937	66	585,777	75	672,938	83	745,348	125	1,119,469	357	3,191,214
MLT Zone (6)	13,253	49	651,727	59	787,601	70	926,366	91	1,203,895	283	3,753,695
Edmonds Zone	14,440	76	1,093,286	95	1,367,198	111	1,603,880	140	2,023,170	371	5,360,647
LS #1 (7)	7,333	76	555,240	95	694,350	111	814,552	140	1,027,493	371	2,722,475
Richmond Beach Zone	39,935	46	1,835,116	70	2,786,399	91	3,625,185	132	5,275,128	369	14,744,535
Lynnwood Zone (8)	7,197	76	544,910	95	681,432	111	799,398	140	1,008,378	371	2,671,827

Notes

1. Values from Table 6.2
2. Value derived from Table 6.3 as modified in Section 6.2.3. An additional allowance of 7% per decade is applied to account for the increased the I/I component
3. The values used for Sub-basin Meter 1 are from Meter 1 flow data
4. The values used for Sub-basin Zone 1 are from Meter 2 flow data
5. The values used for Sub-basin Zone 2 are from Meter 2 flow data
6. The values used for Sub-basin MLT Zone are from Meter B flow data
7. The values used for Sub-basin LS#1 are from the Edmonds Meter at the WWTP
8. No Flow data available for Lynnwood Zone, therefore use Edmonds Meter at WWTP

Table 6.6
Build Out - Flow Projections

Sub-Basins	Population Equivalence (1)	Average Dry Weather		Average Daily		Average Wet Weather		Maximum Month		Peak Day	
		Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)	Flow per Population Equivalent (2)	Sewer Flow (gpd)	Population Equivalent (2)	Sewer Flow (gpd)	Population Equivalent (2)	Sewer Flow (gpd)
Meter 1 (3)	5,057	53	267,792	63	316,396	68	344,170	92	464,523	243	1,228,304
Zone 1 (4)	5,186	44	230,119	63	326,891	82	424,336	121	629,304	366	1,900,560
Zone 2 (5)	13,041	44	578,610	63	821,933	82	1,066,946	121	1,582,319	366	4,778,754
Meter A	20,281	54	1,099,670	80	1,612,604	102	2,066,863	138	2,801,249	336	6,815,764
Meter B	23,916	49	1,176,124	60	1,436,382	71	1,702,177	93	2,233,766	298	7,117,748
Meter C	4,166	52	215,074	84	348,618	110	458,193	166	691,039	520	2,166,871
Meter E	9,886	66	647,948	76	750,279	84	835,293	129	1,274,531	375	3,706,872
MLT Zone (6)	14,948	49	735,122	60	897,792	71	1,063,924	93	1,396,187	298	4,448,858
Edmonds Zone	16,554	76	1,253,366	96	1,586,667	113	1,874,665	144	2,384,863	389	6,445,956
LS #1 (7)	7,838	76	593,424	96	751,230	113	887,587	144	1,129,148	389	3,051,931
Richmond Beach Zone	63,527	46	2,919,245	71	4,525,435	94	5,941,682	137	8,727,523	389	24,716,116
Lynnwood Zone (8)	7,650	76	579,208	96	733,234	113	866,324	144	1,102,098	389	2,978,820

Notes

1. Values from Table 6.2
2. Value derived from Table 6.3 as modified in Section 6.2.3. An additional allowance of 7% per decade is applied to account for the increased the I/I component
3. The values used for Sub-basin Meter 1 are from Meter 1 flow data
4. The values used for Sub-basin Zone 1 are from Meter 2 flow data
5. The values used for Sub-basin Zone 2 are from Meter 2 flow data
6. The values used for Sub-basin MLT Zone are from Meter B flow data
7. The values used for Sub-basin LS#1 are from the Edmonds Meter at the WWTP
8. No Flow data available for Lynnwood Zone, therefore use Edmonds Meter at WWTP

Table 6.7
City of Edmonds - WWTP Flow Projections 2019 and 2033

Sub-Basins	2019				2033			
	Average Annual (gpd) (1)	Maximum Month (gpd) (1)	Maximum Day (gpd) (2)	Peak Hour (gpd) (2)	Average Annual (gpd) (1)	Maximum Month (gpd) (1)	Maximum Day (gpd) (2)	Peak Hour (gpd) (2)
MLT Meter at WWTP								
Meter 1	168,000	237,000			204,000	295,000		
Zone 1	195,000	358,000			237,000	448,000		
Zone 2	422,000	772,000			536,000	1,011,000		
Meter A	1,116,000	1,856,000			1,313,000	2,242,000		
Meter B	456,000	680,000			768,000	1,174,000		
Meter C	149,000	283,000			213,000	414,000		
Meter E	621,000	1,002,000			673,000	1,119,000		
MLT Zone	716,000	1,067,000			788,000	1,204,000		
Total MLT Meter	3,843,000	6,254,000	17,040,000	25,170,000	4,731,000	7,907,000	22,030,000	32,930,000
Edmonds Meter at WWTP								
Edmonds Zone	1,222,000	1,767,000			1,367,000	2,023,000		
LS #1	655,000	947,000			694,000	1,027,000		
Total Edmond Meter	1,877,000	2,715,000	6,770,000	9,850,000	2,062,000	3,051,000	7,890,000	10,880,000
Richmond Beach Meter at WWTP								
Richmond Beach Zone	1,938,000	3,569,000	8,273,000	12,037,000	2,786,000	5,275,000	9,642,000	13,295,000
Total Richmond Beach Meter	1,938,000	3,569,000	8,273,000	12,037,000	2,786,000	5,275,000	9,642,000	13,295,000
Total Flow	7,658,000	12,538,000	32,083,000	47,057,000	9,579,000	16,233,000	39,562,000	57,105,000
Total Flow at WWTP (i.e. accounts for King County flow swap) (3) and (4)	5,720,000	8,969,000	32,083,000	47,057,000	6,793,000	10,958,000	39,562,000	57,105,000

1. Values from Tables 6.4 and 6.5
2. Values for Maximum Day and Peak Hour were derived from the hydraulic model that accounts for short duration storms and flow attenuation. This assumes that all flows (including King County) are sent to Edmonds. Also assumes no backup in the upstream conveyence system.
3. Average Annual and Maximum Month values have subtracted a volume equal to the Richmond Beach values.
4. Maximum Day and Peak Hour values do not subtract the Richmond Beach flows since all flows may be directed to Edmonds for these events.

CHAPTER VII – MODEL CONSTRUCTION AND CAPACITY ANALYSIS

7.1 MODEL SOFTWARE

A hydraulic capacity analysis of the City's existing sewer network was undertaken with the use of XPSWMM, version 14.10 by XPSolutions. This software was selected by the City, and have the following key features and advantages:

- It offers dynamic modeling capability.
- It uses a stable modeling platform.
- License upgrades are available if additional model nodes are required or if models are to be connected.
- XPSWMM software's is capable of reading and using GIS data files that facilitates data transfer and has shape file viewing capability.
- It is widely used by the modeling community in the region including the author.
- Licenses are owned by the author, facilitating multi-user development and review.

7.2 MODEL CONSTRUCTION

7.2.1 Data Sources

The following information was obtained for use in constructing hydraulic models of the existing sewer network:

- City provided GIS base access system including manhole/points, pipes/links, and lift station information
- Lift station as-built, record drawings and plan drawings information were provided to supplement GIS data.
- Lift Station data sheets were provided, as shown in Table 5.2.

Information on planned modifications to the existing sewer network was provided by the City.

7.2.2 Model Coverage

The City has 11 defined Sub-basins (Figure 5.1), 10 of which collect and convey flow into the Edmonds WWTP. The model only includes the City's physical system attributes (pipes, manholes and lift stations) that convey flow into the Edmonds WWTP, and does not include physical system attributes conveying flow to the City of Lynnwood WWTP.

The scope of work limited the extent of importing pipes 8-inches and larger, however with the data available in GIS, it was easier and quicker to incorporate all pipes regardless of size. This allows the model to illustrate physical attributes throughout the City's service area. The modeled area includes all City-owned sewer pipes 8-inches in diameter or greater (with the exception of force mains which have a smaller diameter) within the city limits as determined by GIS shapefiles. The model also contains eight City lift stations (LS) as well as the King County Lake Ballinger Pump Station.

7.2.3 Modeling of Physical System Features

The system data obtained from the City's GIS mapping was imported into the model. Existing City GIS information provided used NAD 1983 datum. Manhole rim elevations were augmented using mapping software ArcGIS ArcMap by utilizing the 2-foot contour elevation attribute information provided by the City. Information was spatially joined to each manhole based upon its geographic locations via 'closest' definition, and software output created a table matching the closest location elevation to the manhole location. Manhole inverts were calculated from the difference between spatially joined rim elevations, measure down depths and pipe diameters. Pipe/link information was imported from the existing City GIS. The upstream and downstream inverts were assigned via connecting manhole information.

The hydraulics were checked for obvious data errors such as incorrect inverts, missing pipe sizes, and negatively sloped pipes. The hydraulics associated with the Lift Stations were investigated based on the most recent available as-built data. Hydraulic revisions included incorporating storage volume for wet well nodes, adding offline storage facilities, adding overflow locations, and adding force mains between the Lift Stations and gravity sewer connections.

In XPSWMM, the ability to input base flow and a diurnal pattern is contained within the "Hydraulics" mode. This parameter combination was used in two different ways in subsequent modeling tasks. For model calibration, the average daily dry weather flow (see Table 6.3) was distributed evenly among the manholes in each respective meter basin. Then a diurnal pattern, as derived from meter data collected at the Edmonds treatment plant, was applied to the dry weather flow for the model to generate a 24-hour hydrograph. The RTK method was used in XPSWMM to generate the infiltration and inflow (I&I) component of the total flow.

For future flows, the peak daily flow (see Tables 6.4, 6.5 and 6.6) for different future scenarios was distributed among the manholes within each meter basin. In this case, a

pattern developed from the calibrated model to represent the I&I response in the pipes was applied. This is further discussed in the Model Calibration and Future Flow Comparison sections.

Nine lift stations were modeled throughout the City service area. These stations were modeled as static head pumps based on capacity and the head data provided by the City. LS 2 was modeled as a dynamic head pump because a pump curve was available. It should be noted that three lift stations were rehabilitated late in 2012, which does not correspond to the available monitoring data. Therefore, the old capacity for these LS was used for the calibration exercise and the capacity was upgraded for the future flow analysis exercise. Table 7.1 below shows the pump capacity and provided head for each LS for the calibration period and for the future flow condition.

Table 7.1 - Lift Station Modeling Data

		Calibration Period		Future Flow	
Lift Station	No. of Pumps	Max Head (ft)	Pumping Capacity[1] (gpm)	Max Head (ft)	Pumping Capacity[1] (gpm)
1	2	40.0	1,425	40.0	1,425
2	2	46.7	128	46.7	128
3[2]	2	180.0	90	190.0	114
5[2]	2	60.0	35	100.0	37
6	2	90.0	335	90.0	335
7	2	45.0	210	45.0	210
8	2	45.0	137	45.0	137
14[2]	2	25.5	33	70.0	37

[1]Represents pumping rate per pump
[2]According to available data, these LS were rehabilitated in 2012 which included increasing LS pumping capacity
[3]Updated PS curve required due to system backups under future flow estimate

The Lake Ballinger PS is also included in the model which had several data unknowns. Most notably, the flow swapping between the City and King County presented a particular challenge because the circumstances of this are mostly unknown or unpredictable. For calibration purposes, the pump curve and a “dummy” overflow weir was used to depict the flow swap. In the future flow conditions, there are times when all the flow is directed to King County and times when all the flow is sent to the City. The flow swap between the City and King County is described in Section 3.4.2. Generally flows from the Lake Ballinger PS enter the City’s system for 15 hours per day. However, there are times when flow is directed simultaneously to both agencies. And lastly, there are times when flow is sent exclusively to only the County’s system. To capture the most severe flow scenario, the hydraulic analysis was configured with the assumption that all flow was being directed to and through the City’s conveyance system. This worst flow condition scenario also assumed a concurrent storm event. This condition is very conservative and captures the most extreme conditions.

For future scenarios, the pump curve had to be upsized to prevent backups in the upstream system due to insufficient pumping capacity and increase peak flows. This

assumption that calls for upsizing pumps to prevent backups would also apply to the King County Pump Station, even though the City has no control on the County's schedule to implement these modifications.

7.3 LOADING

The model was loaded with peak day flow measured at each meter for the initial model calibration. Due to the location of meters throughout the system, some Sub-basin flow loading was calculated by subtraction of measured flow between two flow meters. Following Sub-basin flow calculations, the total Sub-basin flow was evenly distributed between manholes. The intent of the loadings into the sewer system is to determine the total flow along the conveyance system and at the WWTP.

The area that flows to Lynnwood WWTP (Sub-basin Lynnwood Zone) enters a large diameter interceptor that is owned and maintained by the City of Lynnwood. This interceptor is the backbone of flows entering that plant. The majority of the Edmonds flow enters this interceptor through 8-inch diameter pipes. The remaining Edmonds' flow is collected and pumped through one of six Edmonds-owned lift stations.

The hydraulic analysis of the Lynnwood Zone looks at the tributary area to each of these lift stations and applying the peak hour flow estimations to determine the suitability of the pumping capacity (refer to Table 7.2).

7.4 HYDROLOGIC MODELING

In order to perform model calibration to observed flows, the "Runoff" (Rnf) mode of XPSWMM was utilized to introduce hydrologic flow into the model. The Rainfall Dependent Inflow and Infiltration (RDII) module of XPSWMM was used to represent wet weather response in the system. This module relies upon the RTK method of hydrograph generation. Three parameters (R, T, and K) for three different I&I response times (short-, medium-, and long-term) are required. The R parameter is the percentage of rainfall that makes its way into the sewer system, T is the time to peak for that volume of water, and the K determines the duration of the recession limb. The three sets of parameters compute three triangular hydrographs which are added by the method of convolution to generate the total hydrograph. Accepted values based on past engineering experience were used as initial values. These values were adjusted during model calibration so that the peaking factor and daily averages matched within reasonable values.

Table 7.2
Lynnwood Zone Lift Station Analysis

Lift Stations	Current Rated Capacity (gpm @ TDH)	2010		2019		2033		Build Out	
		Population Equivalent	Peak Hour Flow (gpm) (1)	Population Equivalent	Peak Hour Flow (gpm) (1)	Population Equivalent	Peak Hour Flow (gpm) (1)	Population Equivalent	Peak Hour Flow (gpm) (1)
LS #4 (2)	308 gpm @ 164 ft	645	179	675	188	702	195	731	203
LS #9 (5)	332 gpm @ 38 ft	838	233	877	244	912	253	950	264
LS #10 (2)	114 gpm @ 49 ft	204	57	214	59	222	62	231	64
LS #11 (3)	95 gpm @ 73 ft	19	5	20	6	21	6	22	6
LS #12 (3)	308 gpm @ 142 ft	672	187	704	195	731	203	762	212
LS #15 (4)	42 gpm @ 60 ft	22	6	23	6	24	7	25	7

Notes
1) Peak Hour flow rate from DOE Orange Book
2) LS #10 pumps to LS #4 which lifts to the WWTP.
3) LS #11 pumps to LS #12 which lifts to the WWTP.
4) LS #15 pumps directly to the WWTP.
5) LS #9 lifts into the gravity system that enters the Lynnwood Interceptor.

7.5 MODEL CALIBRATION

Model calibration is an iterative process to match model predicted values to measured real world data. Average daily flow (ADF) data collected at 10 meter locations between 2006 and 2012 was used during calibration. The purpose of the this modeling exercise was to examine system capacity for the comprehensive plan, therefore the peak daily flow (PDF) from the monitoring period was collected for each meter basin. This value was used as the calibration metric.

Sewer system flow is made up of different components, most notably average dry weather flow (ADWF) and I&I. Following storm events, the I&I component is generally much larger than the ADWF component. For model calibration, the flow input into the model was separated into these two components. The ADWF per manhole was broken down for input into the model as follows:

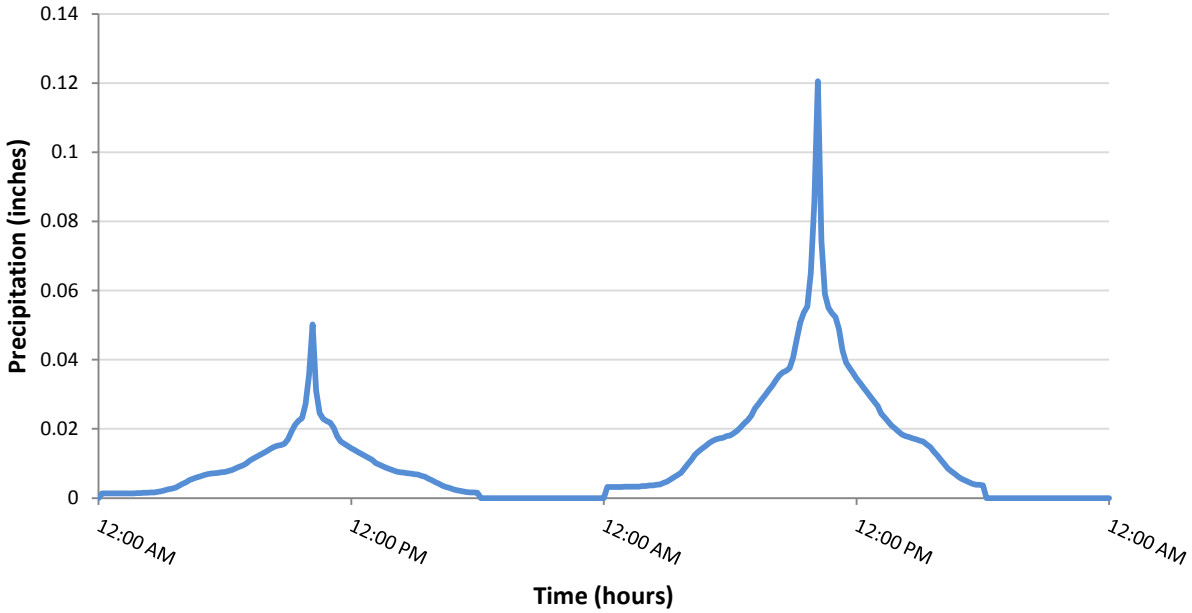
$$\text{ADWF} = \frac{\text{Meter ADWF}}{\text{No. Tributary MHs}}$$

In order to represent fluctuations in flow throughout the day, a diurnal pattern was applied to the ADWF component. This pattern was determined by processing 5 minute interval flow data at the Edmonds Treatment Plant for three contiguous dry months of a given year. Figure 6.1 shows this pattern. This same pattern was used for th entire service area.

As mentioned in Section 7.4, the RDII module of XPSWMM was used to generate the I&I flow component. Only PDF values were presented in Table 6.3, which means that some portion of the day will have a flow that is lower than average and some portion will have a flow that is above average. The actual shape of this hydrograph for typical storm conditions for the City system is variable. The peak value of the hydrograph is very important because that is the portion of the flow that often causes capacity restrictions. Monitoring data collected at the treatment plant indicated that the peaking factor at the plant was approximately 1.27, meaning the peak flow for the day was approximately 27% higher than the peak day. It was assumed that for meters located upstream in the system the peaking factor would be greater to account for attenuation as the flow moved downstream.

A rainfall time-series must be implemented in order to use the RDII module. A typical rainfall pattern for western Washington based on the total rainfall for the November 19, 2012 (2.4-inches of total rainfall and was the largest collected in the monitoring period) storm event was used.

Figure 7.1 - Rainfall Hyetograph used for Calibration



The model was run for two days to allow for some antecedent condition buildup. Figure 7.1 above shows the rainfall time series that was used for the calibration procedure. The first day had the same rainfall pattern applied with 1-inch of total rainfall, to build antecedent conditions, before the second day with 2.4-inches of total rainfall.

The flow "swapping" situation at the KC Lake Ballinger Pump Station presented a considerable challenge during model calibration. Mass balance analysis determined that for the peak flow periods being considered, an average of approximately 4.2 MGD (6.5 cfs) of flow is sent towards Edmonds from the KC pump station. Thus, the total pumping capacity at the pump station was set to 6.5 cfs and a weir was added to allow additional flow to leave the model (this represented the flow being sent towards King County). A significant portion of the flow seen at the total MLT meter at the plant is being sent from the KC Lake Ballinger PS (refer to Figure 5.2 for meter schematic).

The service area is divided up into Sub-basins. The flow from different "meter" areas had flow contributions that are measured directly at a meter location. The flows from the "zone" areas had to be determined from a mass balance exercise. These numbers can be somewhat unreliable. But in the absence of any other information, the modeled used this available data in the calibration exercise. Table 6.3 shows the mass balance results and the target PDF numbers used in calibration.

Table 7.3 shows the PDF at each meter location, the model predicted average, the assumed peak hourly flow at each meter, and the model predicted peak hourly flow.

Table 7.3 - Calibration Result Summary

Flow Meter	Model Peak Flow (cfs)	Assumed Peak Flow (cfs)[1]	Diff (%)	Model Peak Day Flow (cfs)	Observed Peak Day Flow (cfs)	Diff (%)	Model Peak:Peak Day
Total Meter D	10.95	8.44	29.7%	6.74	6.64	1.5%	1.62
Total Meter B	3.24	2.61	24.3%	1.89	2.06	-8.3%	1.72
Total Meter A	8.33	7.32	13.8%	5.07	5.76	-12.0%	1.64
Total Meter 2	3.80	3.42	11.0%	2.28	2.69	-15.3%	1.67
Total Meter 1	1.32	1.09	20.7%	0.79	0.86	-7.6%	1.66
Total Edmonds	14.01	12.22	14.6%	8.04	9.62	-16.5%	1.74
Total MLT Zone	15.47	15.38	0.6%	11.47	12.11	-5.3%	1.35

[1]Based on 1.27 peaking factor at the treatment plant

The focus of calibration was at the Edmonds Treatment Plant with the meters Total MLT Zone and Total Edmonds having the most emphasis as they are nearest the treatment plant. The Total Edmonds meter is heavily influenced by a nearby LS and this greatly impacted the average flow. Because limited data is available for calibration, a percent difference between model predicted PDF and the monitoring PDF of +/- 20% was determined to be satisfactory. The assumed peak flow shown in Table 3 was determined by multiplying the monitored PDF value by 1.27 (the peaking factor at the plant). This value was not explicitly used as a calibration metric, but was tracked to ensure peak values predicted by the model were within acceptable ranges compared to the PDF values.

7.6 MODELING ANALYSIS AND RESULTS

CAPACITY ANALYSIS

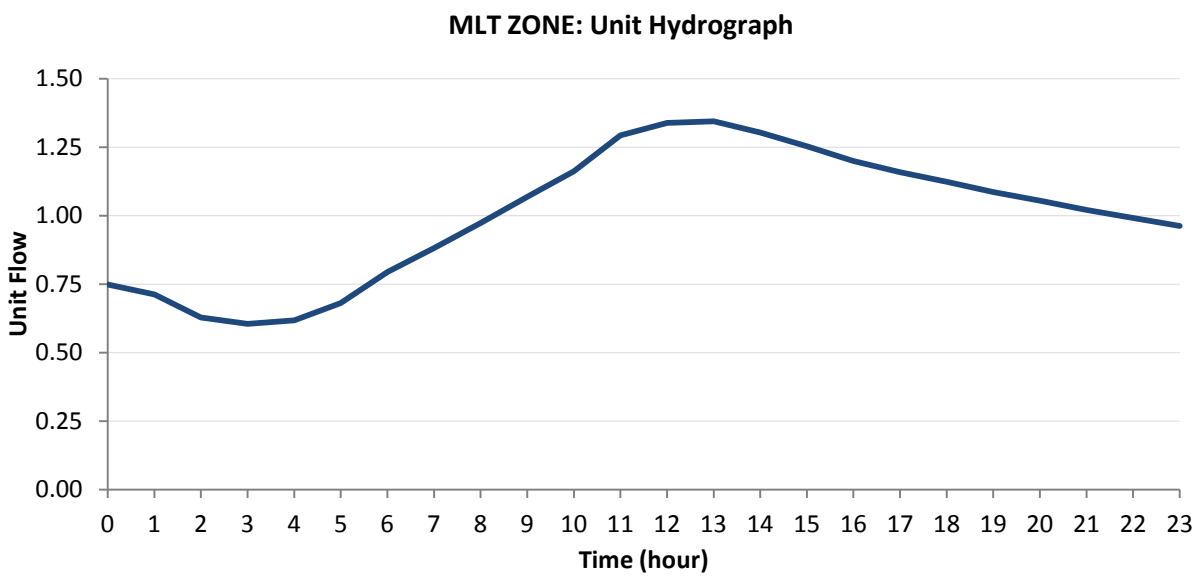
The capacity analysis was used to determine which pipes may require upsizing due to current lack of capacity or population growth and deterioration of existing infrastructure. Four conditions for capacity analysis were looked at; 2013 (existing), 2019, 2033, and Buildout. Table 6.3 presents the PDF for each meter basin. Considering the relative uncertainty involved in using the RDII module for predicting future flows, it was decided to directly input into the model future PDF values distributed among respective meter basins, replacing the ADWF was input during the calibration task. This allows for a methodology that controls exactly how much flow is being entered into the system. Therefore, the RNF mode of XPSWMM and rainfall time series utilized in the calibration exercise were no longer required for capacity analysis. However, hydrograph shape determined during calibration was used to develop a unit hydrograph representing wet weather system response for each meter basin. This diurnal pattern was applied to future flows in determining the peak flow predicted by the model.

The PDF for each year are shown below in Table 7.4 and the unit hydrograph for meter MLT Zone is shown in Figure 7.2 as an example.

Table 7.4 - Peak Average Daily Flow for Capacity Analysis

Zones	Size in Acres	No. Tributary MHs (AQ)	2010 PDF (mgd)	2010 PDF (cfs)	2019 PDF (mgd)	2019 PDF (cfs)	2033 PDF (mgd)	2033 PDF (cfs)	Buildout PDF (mgd)	Buildout PDF (cfs)
Total Meter 1	161	95	0.56	0.86	0.59	0.92	0.76	1.18	1.23	1.90
Zone 1	324	9	1.19	1.83	1.04	1.61	1.33	2.06	1.90	2.94
Total Meter A	1,602	5	3.72	5.76	4.36	6.74	5.38	8.32	6.82	10.55
Total Meter B	555	2	1.33	2.06	2.05	3.17	3.66	5.66	7.12	11.01
Total Meter C	143	1	0.65	1.00	0.86	1.33	1.28	1.98	2.17	3.35
Zone 2	526	342	0.11	0.17	2.24	3.47	3.01	4.65	4.78	7.39
Total Meter E	663	1	2.44	3.78	2.77	4.28	3.19	4.94	3.71	5.74
MLT Zone	1,574	142	2.55	3.95	3.22	4.98	3.75	5.81	4.45	6.88
Edmonds	1,416	961	4.04	6.26	4.54	7.03	5.36	8.29	6.45	9.97
LS-01 Zone	1,107	821	2.18	3.37	2.43	3.77	2.72	4.21	3.05	4.72

Figure 7.2 - Calibrated Model Diurnal Pattern

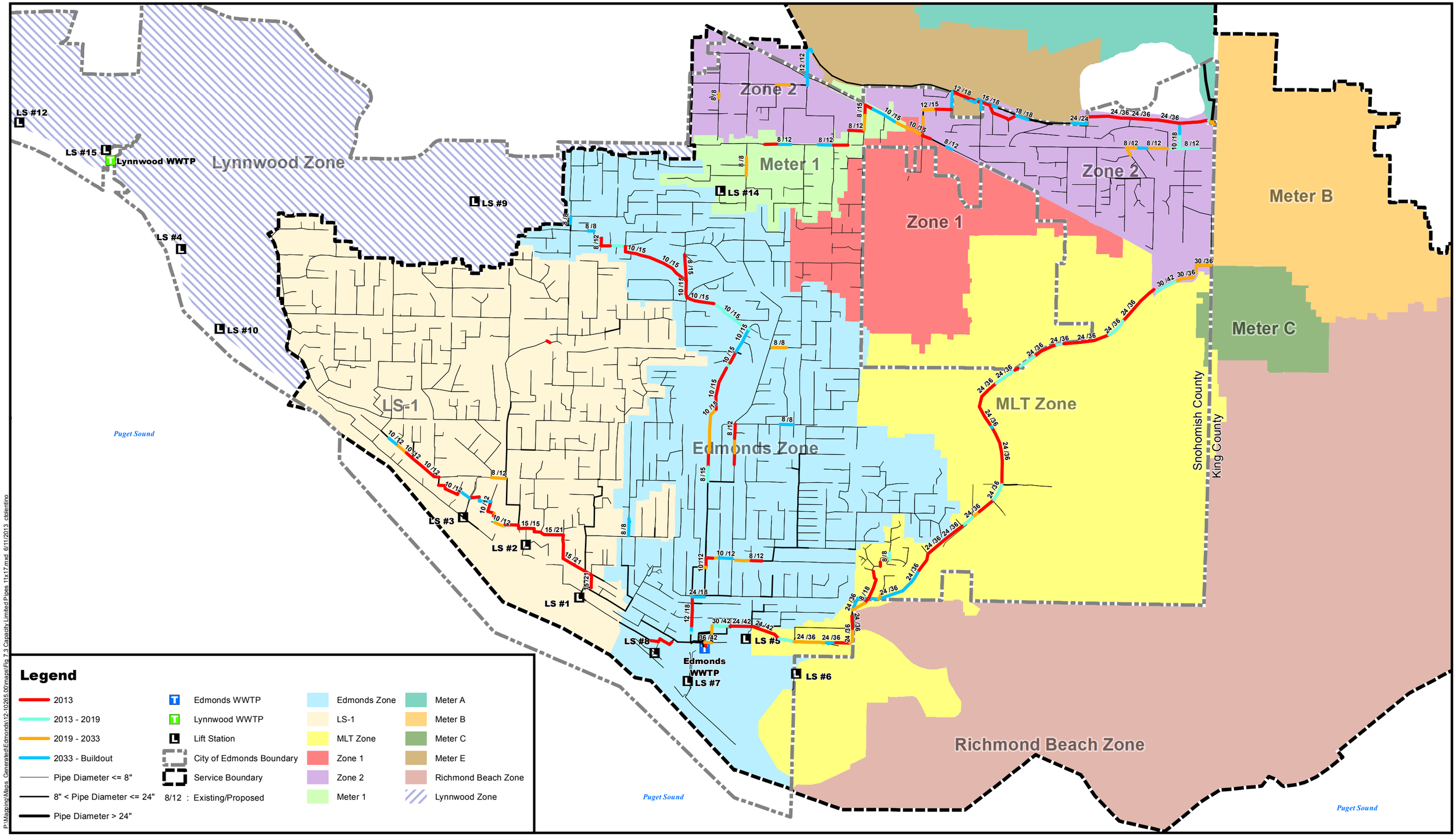


To determine which pipes needed to be upsized, the PDF for the Buildout condition was input into the model as outlined above. The simulated ratio of depth of flow to pipe diameter (d/D) was used as the original basis for upsizing. Several iterations were required to upsize pipes in order to create a free flow condition. The model with the upsized pipes that produced a free flow condition for the Buildout scenario was also run with the PDF for the 2013, 2019, and 2033 scenarios. This produced the peak flow that would be going through each pipe for each future flow scenario (Qyear). These values were then compared to each pipe's existing hydraulic capacity (Qcap). When the ratio of Qyear/Qcap exceeded 0.93, the pipe for that scenario was considered surcharged. The following criteria were used to determine which pipes would require upsizing:

- Upsize pipes whose capacity is limited (Qbuildout/Qcap > 0.93)
- Pipes < 10-inch in diameter whose capacity is limited were upsized to 12-inch
- Pipes > 10-inch whose capacity is limited were upsized in 6-inch increments
- Some exceptions were made if the pipe was only slightly surcharged and then an increase of 3-inch was applied based on engineering judgment
- If any pipes that were not identified as having a Qbuildout / Qcap > 0.93 but have pipes upstream and downstream that were upsized, then these pipes were also upsized for continuity
- No pipe offsets were adjusted
- No forcemains were upsized
- Qyear/Qcap ratio of intermediate scenarios was used to phase the upsizing.

Several iterations of this procedure were conducted. In some cases surcharging was allowed, based on engineering judgment, if the pipe was an isolated case. No Flooding was observed in this system.

In summary, the pipe diameters were upsized for the Buildout peak flows and phasing was determined using the intermediate scenarios. See Figure 7.3 that summarizes the pipe upsizing results on a map showing existing and proposed pipe diameters color-coded by year in which upsizing will be required. The corresponding table of pipe diameters is also included in Appendix B.1. The proposed pipe diameters are preliminary estimates and should be scrutinized further during design engineering.



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\Fig 7.3 Capacity Limited Pipes 11x17.mxd 6/11/2013 ctolentino

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Capacity Limited Pipes: Aqualyze Inc., June 2013
Sewer Zones: City of Edmonds, December 2011
GIS Data: City of Edmonds, Snohomish County & King County.
Data sources supplied may not reflect current or actual conditions. This map is a geographic representation based on information available. It does not represent survey data. No warranty is made concerning the accuracy, currency, or completeness of data depicted on this map.

NORTH

0 1,000 2,000 4,000 Feet

Scale in Feet

CAPACITY LIMITED PIPES

COMPREHENSIVE SEWER PLAN
City of Edmonds
June 2013

Figure **7.3**

FUTURE FLOW COMPARISON

The predicted flow was compared to the calculated value at each flow meter for the Buildout scenario as shown in Table 7.5.

Table 7.5 - Model Results Comparison for Buildout Condition

Flow Meter	Model Peak Flow (cfs)	Assumed Peak Flow (cfs)[1]	Diff (%)	Model Peak Day Flow (cfs)	Model Peak:Peak Day
Total Meter D	26.93	22.82	18.0%	17.70	1.52
Total Meter B	17.07	13.99	22.0%	11.02	1.55
Total Meter A	15.82	13.39	18.1%	10.54	1.50
Total Meter 2	7.49	6.15	21.9%	4.81	1.56
Total Meter 1	2.94	2.41	22.0%	1.88	1.57
Total LS-01 Zone	6.36	6.00	6.0%	4.76	1.34
Total Edmonds	18.99[2]	18.66	1.8%	14.50[2]	1.31
Total MLT Zone	73.62	63.20	16.5%	49.09	1.50

[1]Based on 1.27 peaking factor at the treatment plant
[2]Model predicted portion of flow leaving system through diversion weir at LS-01. Accounted for by adding hydrograph through diversion weir to hydrograph at Total Edmonds Flow Meter in Model Peak and Average Flow in Table.

The methodology outlined above allowed for the phasing sequence of the pipe upsizing for each of the flow scenario. The list of the pipes to be updated along with the year of update is provided in Appendix B. Table 7.6 below summarizes the total pipes in the model in addition to those requiring upsizing phased over the four scenarios.

Table 7.6 - Modeled Pipe Summary

Upsized Pipe Summary	
Total Model Pipes	2,390
Total Pipes Upsized	227
Pipes Upsized 2013	115
Pipes Upsized 2019	34
Pipes Upsized 2033	46
Pipes Upsized Buildout	32
Minimum Existing Diameter (in)	8
Maximum Existing Diameter (in)	36
Maximum Future Diameter (in)	42

7.7 MODEL LIMITATIONS

The list below summarizes the model limitations encountered during this project and should be noted when reviewing or using the results generated by this model.

- LS information provided in the form of pumping capacity and corresponding head was assumed to be correct.
- The limited information available at KC Lake Ballinger PS including detailed configuration of adjacent pipe networks, the flow swapping with King County, and exact pump operation at this facility introduces uncertainties that could affect model results. Every effort was made to ensure information input into the model was sufficient to perform modeling tasks.

CHAPTER VIII – EDMONDS WASTEWATER TREATMENT PLANT

8.1 INTRODUCTION

The purpose of this section is to evaluate the Edmonds Wastewater Treatment Plant for its ability to meet treatment objectives over the planning period.

The Edmonds treatment plant liquid stream consists of a headworks with three mechanical screens, three rectangular primary clarifiers, three aeration basins, three circular secondary clarifiers, and a chlorine contact tank. The disinfected plant effluent is discharged through a single 36-inch diameter outfall into Puget Sound. The outfall branches into two lines 1250 feet out into the bay with two diffusers, each 160 feet long with diffuser ports at MLLW elevation that ranges from 56 to 73 feet deep. The solids stream includes belt press dewatering and incineration of the sludge cake using a fluidized bed incinerator.

A detailed description of the existing facilities is presented in Section 5.4.

The original Edmonds WWTP was completed in 1957 to treat 2.0 million gallons per day (mgd). Edmonds expanded the primary plant to a design flow of 4.0 MGD in 1959, and for a third time in 1967, to a design flow of 7.6 MGD, by adding two clarifiers and effluent pumping. The third expansion also included dewatering equipment and an incinerator for solids handling.

In 1991 the plant was expanded to secondary treatment with a capacity of 11.8 mgd for maximum month loading. A conventional secondary treatment process was implemented consisting of three aeration basins, three circular secondary clarifiers, and a chlorine contact basin. Additionally, new operations and solids handing buildings were constructed. The Edmonds Plant layout is shown in Figure 5.4.

8.2 TREATMENT REQUIREMENTS

The Edmonds wastewater treatment plant operates under the terms of NPDES Permit No. WA-002405-8 last modified May 9, 2012. A copy of the permit is included in Appendix K.

The treatment plant effluent requirements established by the permit are a maximum monthly concentration of 25 milligrams per liter (mg/L) for carbonaceous biochemical oxygen demand ($CBOD_5$), 30 mg/L for total suspended solids (TSS) and 200/ 100 mL for fecal coliform bacteria density. $CBOD_5$ and TSS effluent limits are also held to an 85% minimum removal. The facility is subject to whichever discharge limit is more stringent when reporting: concentration mg/L or 85% removal.

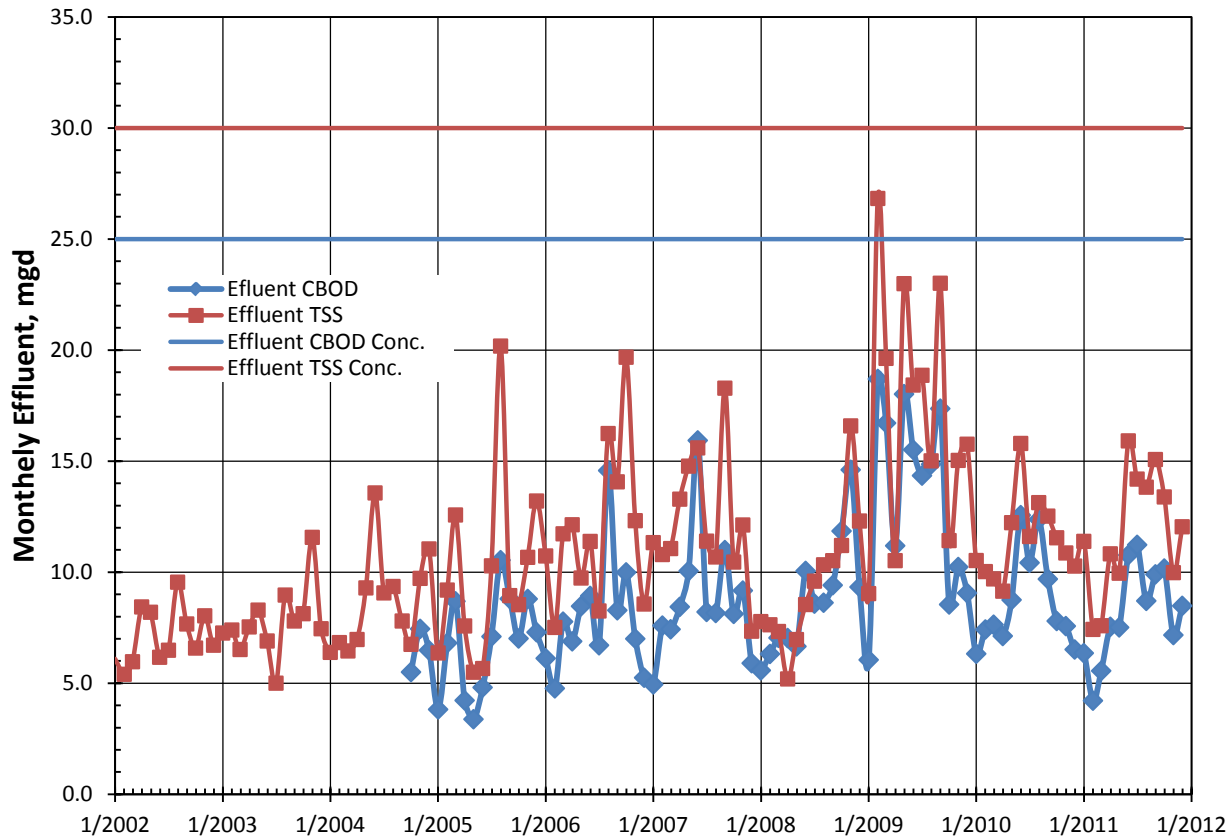
Based on a maximum month design flow of 11.8 million gallons per day (mgd), the average monthly mass discharge limit of 25 mg/L for BOD_5 and 30 mg/L for TSS is

2,460 and 2,952 pounds per day respectively. The permit also limits the chlorine residual concentration to 0.191 mg/L.

8.3 TREATMENT PERFORMANCE

Figure 8.1 is a plot of the effluent $CBOD_5$ and TSS concentration over the last 10 years. The Edmonds plant is consistently under the monthly average of 25 and 30 mg/L limit for $CBOD_5$ and TSS respectively as stipulated in the NPDES Permit.

Figure 8.1 Edmonds WWTP - Effluent $CBOD_5$/TSS Conc.



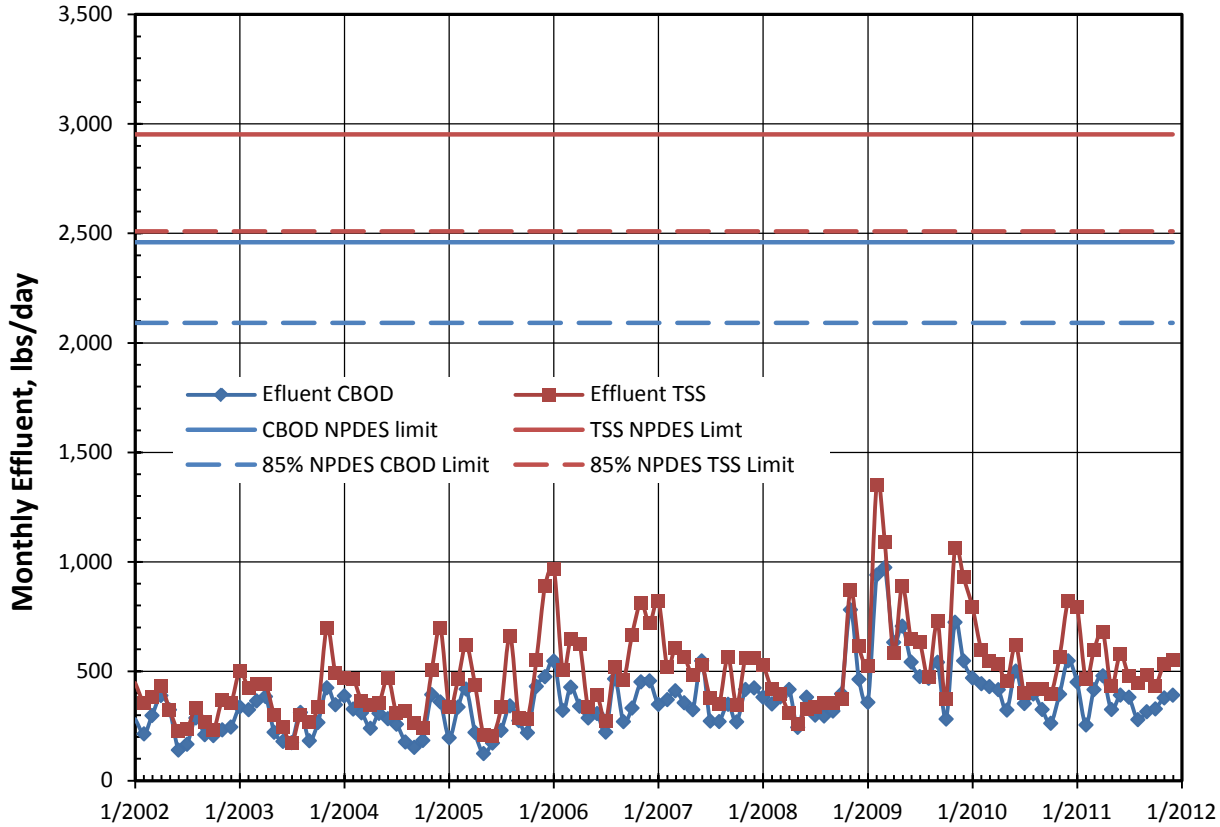
The determination of the effluent mass discharge is calculated by multiplying the concentration times the daily flow:

$$\left(\frac{mg}{L}\right) \cdot \left(\frac{million\ gallons}{day}\right) \cdot 8.34 \left(\frac{lb}{gal}\right) = \frac{lbs}{day}$$

This formula uses the measured effluent concentrations from limited composite samples and the continuously measured flow values. The results yield the total mass BOD and TSS being discharged from the plant. It should be noted, however, that such calculations tend to over-state the total mass. This is referred to as 'flow biasing'. During the wet weather months when extreme flow conditions occur, the extrapolation

of those flow conditions throughout the entire month tends to overestimate the total mass discharge. Figure 8.2 is the effluent mass loading.

Figure 8.2 Edmonds WWTP - Effluent Mass $CBOD_5$/TSS



8.4 NPDES PERMITTED CAPACITY AND HISTORICAL LOADING

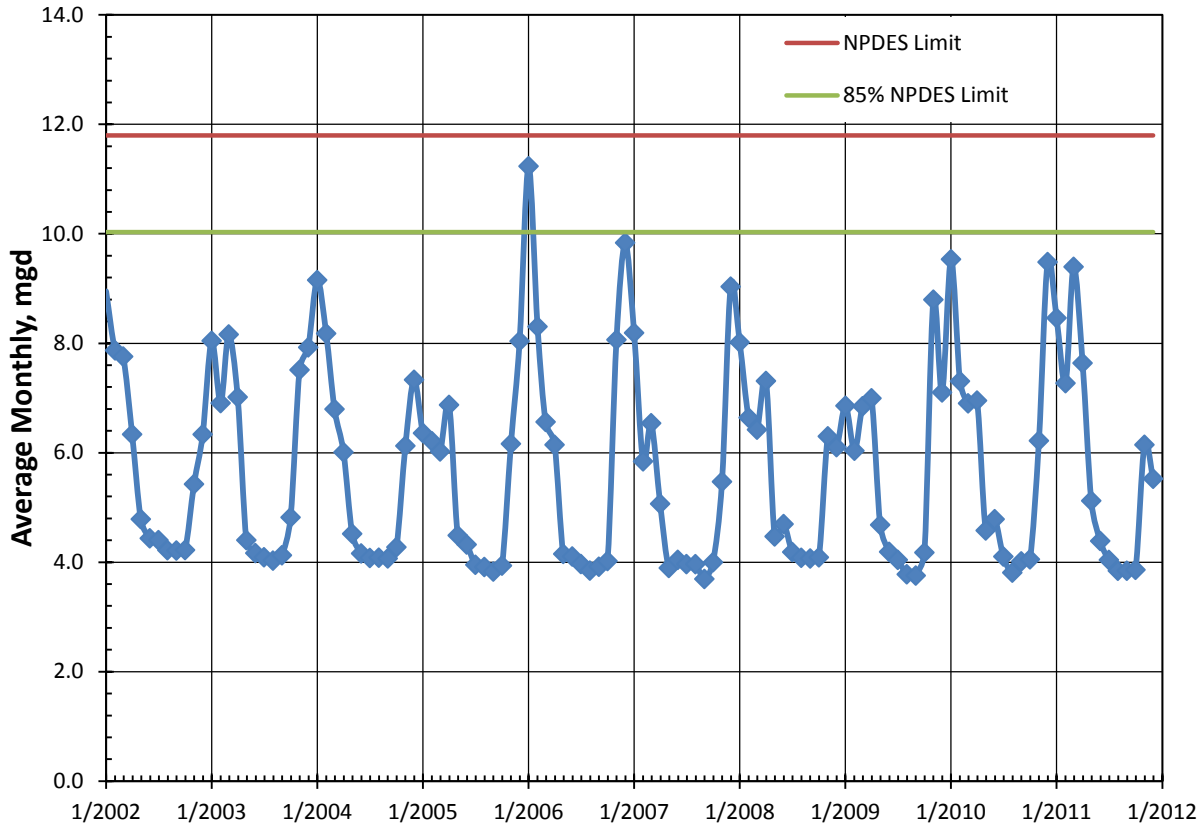
The NPDES permit specifies the permitted capacity of the plant. The Edmonds WWTP is permitted to treat a **maximum monthly flow of 11.8 mgd**. The "maximum month" criterion is the highest monthly average loading in one calendar year.

Section S4.B: *Plans for Maintaining Adequate Capacity*, states that the City of Edmonds needs to submit a plan and schedule to Ecology to maintain capacity if the influent flow reaches 85% of the design criteria for three consecutive months. When flows reach **10.03 mgd** for three months in a row the City will be subject to this condition.

There are three parshall flumes that measures flow at the Edmonds WWTP. As stated in Section 3.4.2, the loading to Edmonds has been largely influenced by the flow swapping agreement with King County through the Lake Ballinger pump station.

Figure 8.3 shows a plot of the influent flow over the last 10 years. As shown the flows are well below the plant design flow, or the level that would trigger a plant expansion study.

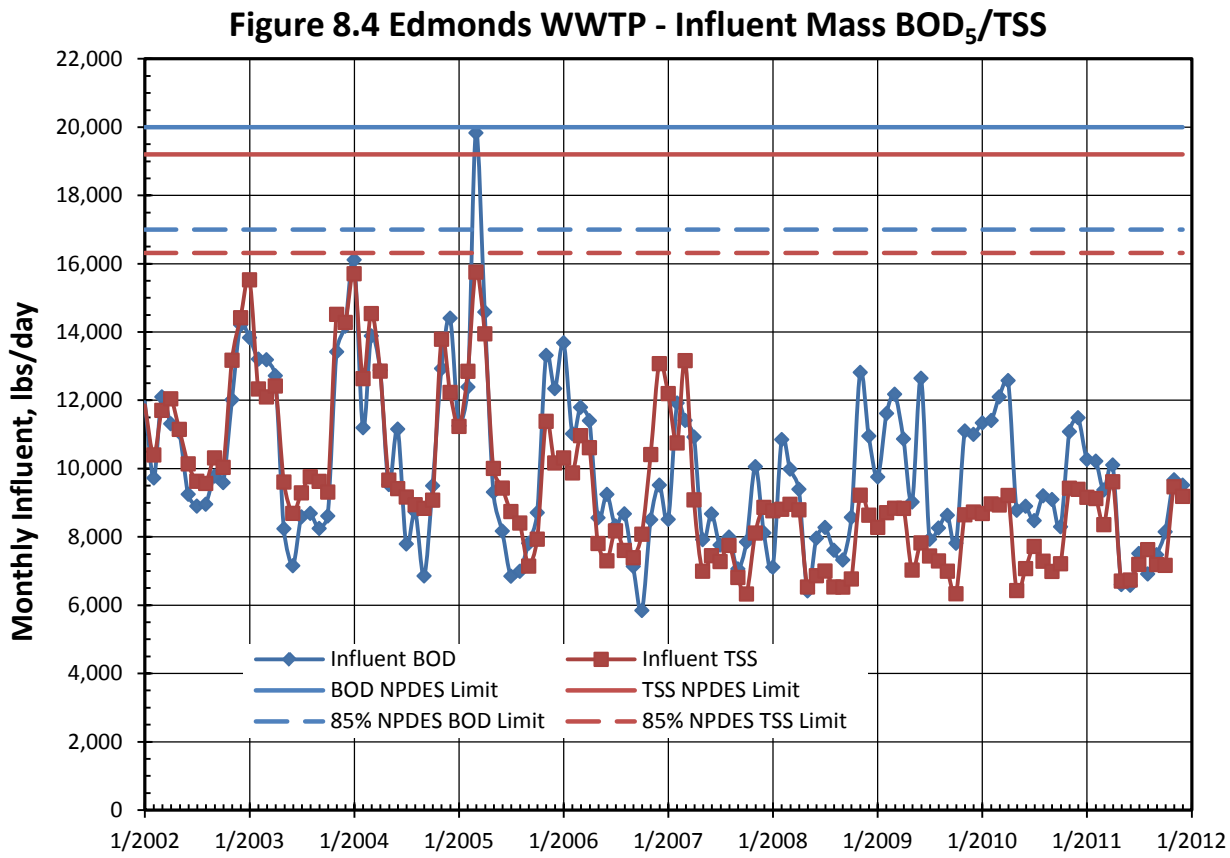
Figure 8.3 Edmonds WWTP - Influent Flow



Average monthly flows through the 10 year period of record show consistent seasonal patterns. Other than one large event in 2006 the influent flow has been far below the NPDES permit. Past flows look to be approaching the 85% limit but this figure does not reflect the new reciprocating flow agreement with King County concerning the Lake Ballinger pump station.

The NPDES permitted average BOD and TSS loading design criteria for the plant in section S4.A is **20,000 and 19,200 lbs/day respectively for maximum month** loads. When BOD loads reach **17,000 pounds per day** or TSS loads reach **16,320 pounds per day** Edmonds will be subject to the 85% planning criteria.

Figure 8.4 shows a plot of the influent mass BOD and TSS over the last 10 years.



8.5 VIOLATIONS AND BYPASSES

In April 2009 the Edmonds plant received a warning letter from the Department of Ecology (DOE) for being out of compliance with their wastewater discharge permit. The violation was for February 2009 because the discharged TSS did not meet the minimum 85% removal because of some temporary process problems. No further action was taken. Aside from the warning letter, Edmonds has had no violations in the last decade concerning treatment or bypasses.

8.6 FUTURE CAPACITY EVALUATION

A capacity analysis has been conducted as part of this comprehensive plan to predict what equipment or processes, if any, are likely to exceed their ability to handle plant flows and loads during the planning period. The capacity analysis is presented as Table 8.1.

Taking into consideration the Lake Ballinger pump station flow swap, projections for future flows and loads were made based on predicted population growth for the Edmonds service area. **The flow projections calculated for the Edmonds plant gave a maximum monthly flow of 5.72 mgd in the year 2019 and 6.79 mgd in year 2033.**

Table 8.1									
Current and Future Loadings to WWTP									
Design / Plant	**Design Data**		**Plant Data**	**NPDES**	**Projected**		**Metcalf and Eddy**		**DOE Orange Book**
Component	**Year 1991**	**Current Design**	**Year 2009-2011**	**Permit WA-002405-8**	**Year 2019**	**Year 2033**	**Typical Design**	**Range Design**	**Range Design**
Population Equivalent									
Flow, mgd									
Average Annual	6.7	9.1	5.79		5.72	6.79			
Maximum Month	8.7	11.8	9.66	11.8	8.97	10.96			
Peak Hour	31.3	40.0	30.30		47.1	57.1			
Max Day	16.8	21.6	21.60	21.5	32.1	39.6			
Max flow to secondary	22.9	22.9	22.90		22.9	22.9			
BOD_5, lbs/day									
Annual AVG	11,200	15,300	9,611		9,490	11,265			
Max Month AVG	14,100	19,200	12,647	20,000	11,744	14,349			
Max day	22,400	30,500	16,276		24,188	29,839			
TSS, lbs/day									
Annual AVG	8,300	11,300	8,051		7,949	9,436			
Max month AVG	11,600	15,900	9,615	19,200	8,929	10,909			
Max day	21,600	29,400	11,321		16,824	20,755			
Per Capita, lbs/cap/day									
Annual AVG BOD									
Annual AVG TSS									
Effluent Limits									
$CBOD_5$, lbs/day									
AVG month, 25 mg/L (NPDES)				2,460					
or									
AVG week, 40 mg/L (NPDES)				3,936					
TSS, lbs/day									
AVG month, 30 mg/L (NPDES)				2,952					
or									
AVG week, 45 mg/L (NPDES)				4,429					
Fecal Coliform Bacteria									
Monthly geometric mean				200					
Weekly geometric mean				400					
Chlorine, lbs/day									
AVG month (0.191 mg/L, NPDES)				18.8					
Max Day (0.442 mg/L, NPDES)				43.5					
Headworks									
Mechanical Bar Screens									
Number	3								
Width, ft	4								

Table 8.1									
Current and Future Loadings to WWTP									
Design / Plant	Design Data		Plant Data	NPDES	Projected		Metcalf and Eddy		DOE Orange Book
Component	Year 1991	Current Design	Year 2009-2011	Permit WA-002405-8	Year 2019	Year 2033	Typical Design	Range Design	Range Design
bar spacing, in	0.5								
Parshall Flumes									
Number	3								
Throat, ft	2								
Raw Sewage Pumps									
Number	4								
Type	vertical, non-clog								
Capacity, each, gpm	9,260								
HP, each	100								
Drive type	2 variable, 2 consant								
Primary Clarifiers									
Primary Sedimentation Tanks									
Number	3	3	3		3	3			
Clarifiers 1&2									
Width, ft	60	60	60		60	60			
Length, ft	60	60	60		60	60			
Clarifiers 3									
Width, ft	45	45	45		45	45			
Length, ft	91	91	91		91	91			
Average Depth, ft	10	10	10		10	10			
Total Surface Area, square feet	11,295	11,295	11,295		11,295	11,295			
Surface Load Rate, gpd/sf									
Annual Average	593	806	513		506	601	1,000	800 to 1,200	
Max month	770	1,045	855		794	970			
Peak hour	2,771	3,541	2,683		4,170	5,055	2,500	2,000 to 3,000	
Detention time, hrs									
Annual Average	3.0	2.2	3.5		3.5	3.0			
Max month	2.3	1.7	2.1		2.3	1.9	2	1.5 to 2.0	
Peak hour	0.6	0.5	0.7		0.4	0.4			
Max Day	1.2	0.9	0.9		0.6	0.5			
BOD Removal, %									
Annual Average flow	39%	36%	37%		37%	35%		25 to 40	
Maximum month flow	36%	33%	31%		32%	30%			
Max Day	29%	26%	28%		21%	18%			
TSS Removal, %									
Annual Average flow	61%	58%	62%		62%	61%		50 to 70	
Maximum month flow	58%	54%	57%		58%	55%			
Max Day	49%	45%	40%		32%	28%			

Table 8.1									
Current and Future Loadings to WWTP									
Design / Plant	**Design Data**		**Plant Data**	**NPDES**	**Projected**		**Metcalf and Eddy**		**DOE Orange Book**
Component	**Year 1991**	**Current Design**	**Year 2009-2011**	**Permit WA-002405-8**	**Year 2019**	**Year 2033**	**Typical Design**	**Range Design**	**Range Design**
Aeration Basins									
Number	3	3	3		3	3			
Width, ft	58	58	58		58	58			
Length, ft	75.3	75.3	75.3		75.3	75.3			
Side water depth, feet	20.6	20.6	20.6		20.6	20.6			
Volume total, gal	2,018,892	2,018,892	2,018,892		2,018,892	2,018,892			
Contact zone volume, gal	348,000	348,000	348,000		348,000	348,000			
CMAS Mode									
Total Detention Time, hr									
Annual Average	7.2	5.3	8.4		8.5	7.1			
Max month	5.6	4.1	5.0		5.4	4.4		3 to 5	
Max Day	2.9	2.2	2.2		1.5	1.2			
MLSS Conc, mg/L	1,800	1,800	1,708		1,800	1,800		1,500-4,000	
Q_R/Q, mgd/mgd								0.25 to 0.5	
F:M Ratio									
Annual Average	0.23	0.33	0.42		0.20	0.24			
Max month	0.30	0.43	0.46		0.26	0.33		0.2 to 0.6	
Max Day	0.53	0.75	0.61		0.63	0.81			
SRT, days									
Annual Average	9.3	6.3	9.4		10.0	8.1			
Max month	6.2	4.2	6.9		8.0	6.2		3 to 15	
Max Day	2.8	1.9	4.2		2.6	2.0			
Oxygen Demand, lb/hr									
Annual Average	315	452	278		275	333			
Max month	413	591	400		367	463			
Max Day	733	1041	537		880	1120			
Contact Stabilization Mode									
Contact MLSS Conc, mg/L								1,000-3,000	
Contact time, min									
Annual Average	75	55	87		88	74			
Max month	58	42	52		56	46		30 to 60	
Peak Hour, w/out bypass	16	13	17		11	9			
Peak hour, w/ bypass	22	22	22		22	22			
Max Day	30	23	23		16	13			
Stabilization MLSS Conc, mg/L								6,000-10,000	
Stabilization time, hrs									
Annual Average	12.0	8.8	13.8		14.0	11.8			
Max month	9.2	6.8	8.3		8.9	7.3			
Max Day	4.8	3.7	3.7		2.5	2.0			
Peak hour, w/ bypass	3.5	3.5	3.5		3.5	3.5		2 to 4	
Peak Hour, w/out bypass	2.6	2.0	2.6		1.7	1.4			

Table 8.1									
Current and Future Loadings to WWTP									
Design / Plant	**Design Data**		**Plant Data**	**NPDES**	**Projected**		**Metcalf and Eddy**		**DOE Orange Book**
Component	**Year 1991**	**Current Design**	**Year 2009-2011**	**Permit WA-002405-8**	**Year 2019**	**Year 2033**	**Typical Design**	**Range Design**	**Range Design**
Q_R/Q, mgd/mgd	0.50	0.50	0.50		0.50	0.50		0.50 to 1.50	
Blowers									
Number	4								
Type	multi-stage, centrifugal								
Capacity, each,	3,300								
HP, each, cfm	250								
RAS Pumps									
Number	4								
Type	Horizontal, non-clog centrifugal								
Capacity, each,gpm	2,100								
HP, each	25								
Secondary Clarificaters									
Number	3	3	3		3	3			
Diameter, ft	90	90	90		90	90			
Side water Depth, ft	17.5	17.5	17.5		17.5	17.5			
Total surface area, sq ft	19,085	19,085	19,085		19,085	19,085			
Surface loading rate, gpd/sq ft/d									
Annual average flow	351	477	304		300	356		400 to 700	
Maximum month flow	456	618	506		470	574			
Peak to secondary (w/out bypass)	1,640	2,096	1,588		2,468	2,992		1,000 to 1,600	
Peak To secondary (w/ bypass)	1,200	1,200	1,200		1,200	1,200			
Total weir length, ft									
Solids loading, lb/hr/sf									
Annual average flow	0.3	0.4	0.3		0.3	0.3			
Maximum month flow	0.4	0.6	0.5		0.4	0.5		0.8 to 1.2	
Peak hour	1.2	1.57	1.4		1.9	2.2		1.6	
Chlorine Contact Chamber									
Number of Tanks	2	2	2		2	2			
Length, ft	251	251	251		251	251			
Width, ft	5.5	5.5	5.5		5.5	5.5			
Side water depth, ft	15.5	15.5	15.5		15.5	15.5			
Total volume, gal	320,110	320,110	320,110		320,110	320,110			
Dentention Time, min									
Annual Average	69	51	80		81	68		30 to 120 min	60-120
Maximum month	53	39	48		51	42			
Peak hour	15	12	15		10	8		15 to 90 min	> 20
Number of Chlorinators									

Table 8.1									
Current and Future Loadings to WWTP									
Design / Plant	**Design Data**		**Plant Data**	**NPDES**	**Projected**		**Metcalf and Eddy**		**DOE Orange Book**
Component	**Year 1991**	**Current Design**	**Year 2009-2011**	**Permit WA-002405-8**	**Year 2019**	**Year 2033**	**Typical Design**	**Range Design**	**Range Design**
*including portion of outfall									
Chlorination Equipment									
Number of Chlorinators	2	2	2		2	2			
Capacity, lb/day	2,000	2,000	2,000		2,000	2,000			
Cylinder Size, lbs	2,000	2,000	2,000		2,000	2,000			
Cylinder Storage Number	8	8	8		8	8			
Average Daily Demand, lbs	380	380	380		380	380			
Effluent Pumps									
Number	5								
Type	Vertical, mixed flow								
Capacity, each,gpm	7,000								
HP, each	100								
Drive type	(2) VFD, (3) constant								
Primary Sludge Production									
Annual Average			4,627		4,932	5,715			
Max month			5,733		9,715	11,496			
Sludge avg TS, %			3.44%				2-6%		
Secondary Sludge Production									
Annual Average			5,484		5,413	6,631			
Max month			8,476		7,780	9,915			
Sludge avg TS, %			0.65%				0.5 to 1.5%		
Primary Sludge and Scum Pumps									
Number	6					21,411	83,898		
Type	Air operated, diaphram								
Capacity, gpm	150								
Primary Sludge Storage Tanks									
Number	1	1	1		1	1			
Volume, gal	29,000	29,000	29,000		29,000	29,000			
Detention Time, days									
Annual Average		1.2	1.8		1.7	1.5			
Maximum month		0.9	1.5		0.9	0.7			
Max day		0.8			0.8	0.8			
Mixer type and HP									

Table 8.1									
Current and Future Loadings to WWTP									
Design / Plant	**Design Data**		**Plant Data**	**NPDES**	**Projected**		**Metcalf and Eddy**		**DOE Orange Book**
Component	**Year 1991**	**Current Design**	**Year 2009-2011**	**Permit WA-002405-8**	**Year 2019**	**Year 2033**	**Typical Design**	**Range Design**	**Range Design**
Primary Sludge Transfer Pumps									
Number	2								
Type	Air operated diaphram								
Capacity, gpm	150								
WAS and Secondary Pumps									
Number	5								
Type	Progeressive Cavity								
Capacity, each,gpm	50								
HP, each	5								
Drive type	Constant								
WAS Storage Tank									
Number	1	1	1		1	1			
Volume, gal	102,000	102,000	102,000		102,000	102,000			
Detention Time, days									
Annual Average		1.7	1.0		1.0	0.9			
Maximum month		1.0	0.7		0.7	0.6			
Max day		0.6							
Mixer type and HP									
WAS Transfer Pumps									
Number	2								
Type	Progeressive Cavity								
Capacity, each,gpm	150								
HP, each	7.5								
Drive type	VFD								
Belt Filter Press									
Number	2	2			2	2			
Width, ft	6.6	6.6			6.6	6.6			
Capacity, each, gpm	150								
Hours operated/Day									
Annual Average		12	12		12	12			
Max month		17	17		17	17			
Max Day		23.7	23.7		23.7	23.7			
Loading, gpm, one BP for hours operated									
Annual Average		108	162		162	197			
Max month		116	172		173	218			
Max Day		130			187	235			
Loading, lb dry solids/hr		509			509	509			

Table 8.1									
Current and Future Loadings to WWTP									
Design / Plant	**Design Data**		**Plant Data**	**NPDES**	**Projected**		**Metcalf and Eddy**		**DOE Orange Book**
Component	**Year 1991**	**Current Design**	**Year 2009-2011**	**Permit WA-002405-8**	**Year 2019**	**Year 2033**	**Typical Design**	**Range Design**	**Range Design**
Incinerator									
Number	1	1			1	1			
Type	Fluidized bed								
Diameter, ft	10	10			10	10			
Capacity, mmbtu	9.7	9.7			9.7	9.7			
Hours Operated Daily									
Annual Average		12	12		12	12			
Max month		17	17		17	17			
Max Day		23.7	23.7		23.7	23.7			
Capacity, lb/hr	942								
Loading, lb dry solids/hrs operated									
Annual Average			843		862	1,029			
Max month			836		1,029	1,259			
Ash Thickening									
Number	1								
Type	gravity								
Diameter, ft	8								
Ash Dewatering									
Number	1								
Type	vacuum filter								
Capacity, lb/hr	200								
Ash Production, cy/d									
Annual Average		2.1			2.1	2.1			
Max month		3.2			3.2	3.2			
Max Day		4.0			4.0	4.0			

These projected flows are far less than the overall rated capacity of 11.8 mgd for the plant and do not exceed the 85% criteria (10.03 mgd) within the planning period. The projected maximum month BOD loadings for the plant are 11,744 pounds per day in 2019 and 14,349 pounds per day in year 2033. The BOD loading in 2033 is far less than the 85% design criteria let alone the NPDES permitted limit of 20,000 lbs/day.

The projected TSS lbs/day maximum month loading for the Edmonds plant is 8,949 and 10,909 lbs/day, in years 2019 and 2033, respectively. The projected TSS load in year 2033 is less than half of the NPDES permitted limit of 19,200 lbs/day.

In addition to the overall plant capacity analysis, the capacity of the plant's individual unit processes were evaluated against typical design values, as shown in literature that is widely consulted in the wastewater engineering field, including "*Wastewater Engineering: Treatment and Reuse",* by Metcalf & Eddy; "*Design of Municipal Wastewater Treatment Plants",* prepared jointly by the Water Environment Federation (WEF) and American Society of Civil Engineers (ASCE); and "*Criteria for Sewage Works Design*" (the Orange Book) by the Washington State Department of Ecology

Using these projections the capacities of the unit processes were compared with commonly accepted design values, as shown on Table 8.1. The capacity for the mechanical equipment used was based on the manufacturer's rating and the plant design data. **None of the unit processes are projected to be significantly overloaded during the planning period.**

The only unit process that is not meeting typical design criteria is the chlorine contact chamber detention time. The facility, already aware of this, maintains elevated disinfection levels as explained in the Section 5.4.2. Furthermore, the current operation feeds sodium hypochlorite at the secondary clarifier weir overflow which increases the contact time.

8.7 FUTURE REGULATORY ISSUES FOR WWTP

The existing liquid stream processing at the Edmonds facility regularly produces compliant effluent and the capacity of the plant can easily handle the projected flows and loads. However, there are three potential regulatory issues that could impact the plant requirements in the future. The potential regulatory issues are:

- Sewage Sludge Incineration (SSI) Air Emissions
- Secondary Treatment Bypass
- Total Nitrogen Discharge Limits

8.7.1 Sewage Sludge Incineration (SSI) - Air Emissions

The most pressing issue is the requirement of new sewage sludge incinerator (SSI) air quality standards. On February 21, 2011, the EPA published their newest final SSI

emission regulations in the Federal Register Title 40 Part 60, under the provisions of the Clean Air Act (CAA), Section 129 "Solid Waste Incineration Units". These new standards supplement the older Clean Water Act (CWA 40 CFR, Part 503) regulations. The new regulations were declared to be effective on May 20, 2011. The regulations dictate different emission limits for new (or substantially modified) incinerators and for existing sewage sludge incinerators; as well as different limits for multiple hearth incinerators and fluidized bed incinerators. Existing SSI units will have 5 years to comply from the effective date of the regulations, or until May 19, 2016. The new CAA regulations will require a Title V air permit.

Previous regulations for sewage sludge incinerators (SSI) were based on emission limits established in Title 40 Part 503 of the Clean Water Act (CWA). The previous air quality emission limits were as follows, and the City has been in compliance with these limits:

- Particulate matter emission limit of 0.18 g/m^3 (0.08 grams/cu ft) dry gas at standard temperature and pressure corrected to 12% carbon dioxide.
- Beryllium emission of 10 g per 24-hour period.
- Mercury emission limit of 3,200 g per 24-hour period.
- Lead, arsenic, cadmium, chromium, and nickel feed cake limits based on ambient air quality and health risk specific concentrations.
- Total Hydrocarbons monthly average concentration of 100 ppm by volume, corrected to 0% moisture and 7% oxygen.
- Carbon monoxide monthly average concentration of 100 ppm by volume, corrected to 0% moisture and 7% oxygen.

The new emission limits that apply to the Edmonds Wastewater Treatment Plant are given in Table 8.2 below. The existing SSI regulation is for incinerators that were in operation before the new regulations. New SSI's built, or substantially modified, will be held to more stringent emission limits. Substantial modification includes any revisions to the feed system, reactor, ash system and energy recovery systems; but not the emission control equipment or routine maintenance.

In addition to new emission limits, the new regulations will require that compliance tests be conducted annually.

The "2007" column in Table 8.2 summarizes data received from the plant for their source emissions evaluation by Am Test-Air Quality, LLC, which was conducted in late May of 2007 and finalized into a report in July 31, 2007. The 2007 evaluation was based on the old regulations, so there are several pollutants (hydrogen chloride, dioxins and furans) that are currently regulated that were not sampled or tested.

Table 8.2 EPA Emission Limits for Fluidized Bed Incinerators

Pollutant	Units	Existing SSI	New SSI	2007
Cd	mg/dscm @ 7% O_2	0.0016	0.0011	0.00031
CO	ppmvd @ 7% O_2	64	27	1.6
HCl	ppmvd @ 7% O_2	0.51	0.24	-
Hg	mg/dscm @ 7% O_2	0.037	0.0010	**0.053**
NO_X	ppmvd @ 7% O_2	150	30	24
Pb	mg/dscm @ 7% O_2	0.0074	0.00062	**0.180**
PCDD/PCDF, TEQ	ng/dscm @ 7% O_2	0.10	0.0044	-
PCDD/PCDF, TMB	ng/dscm @ 7% O_2	1.2	0.013	-
PM	mg/dscm @ 7% O_2	18	9.6	**34.8**
SO_2	ppmvd @ 7% O_2	15	5.3	10.5

Where:

Cd - Cadmium
CO - Carbon Monoxide
HCl - Hydrogen Chloride
Hg - Mercury
NO_X - Nitrogen Oxides
Pb - Lead
PCDD/PCDF - Polychlorinated Dibenzo -P-Dioxins and Polychlorinated Dibenzofurans
PM - Particulate Matter
SO_2 - Sulfur Dioxide
TEQ - Toxic Equivalency
TMB - Total Mass Balance

Stack gas emission records are limited. Assuming that this one test is representative of Edmond's sludge, improvements to the existing emission control equipment will be required. However, it should be noted that sludge quality can vary significantly between samples and one sample is not necessarily representative. A significant sampling and testing program is recommended before any modifications are made to the emissions control system.

The 2007 report conducted three runs for each of the tests and the sludge was further analyzed during each run. In Table 8.2, the 2007 column has three pollutants that exceed the new regulations for existing SSI's; mercury, lead, and particulate matter. Particulate matter and most metals (except mercury) are removed as solids by the plant's existing Venturi scrubber. Because of its extremely high vapor pressure, mercury is 100% vaporized during the incineration process. so it is not removed by the existing wet scrubber. If mercury cannot be removed by source controls, a new packed-bed carbon scrubber will be required.

The **particulate matter** concentration is above the new regulated threshold. The EnviroCare International VenturiPak™ scrubber system at Edmonds has been widely tested at other locations and generally complies with the new particulate matter regulations for existing incinerators. The VenturiPak™, if operated optimally, is typically in compliance with the new regulations for existing SSI for Cd, HCl, Pb, PM, and SO_2.

The 2007 concentrations are likely the results of the scrubber system not operating optimally. An evaluation of the system was conducted in 2012 which resulted in a new venturi throat and additional sprays were added. A compliance test was conducted in 2013 and all new standards were met.

If further optimization of the existing scrubber is needed to meet the new regulations, then additional treatment to remove small (sub-micron) particulates will be required. EnviroCare makes a wet electrostatic precipitator (Star™ ESP) that can be retro-fit with the existing scrubber. The estimated cost of the retro-fit would be about $0.8 million. A pilot test of this equipment is scheduled in 2013.

Lead emissions appear to be very high but this is misleading. The first two emission test runs were in compliance but the third test run was 400 times the concentration of the first two. Considering that the lead concentration in the bio-solids varied by only 9% (at one standard deviation) suggests that the concentration found in the third emissions run was invalid. The skewed emissions test run was perhaps a recording, operations, or lab error but it is not likely representative of typical emission levels. A new stack test would confirm this.

Mercury emissions are not reduced by the existing scrubber system and other actions will likely be necessary for lowering this emissions concentration. Edmonds has two choices to control mercury emissions:

- Require amalgam separators at dental offices
- Implement mercury emission removal equipment

Amalgams are the mercury fillings used in dentistry. Requiring dentists in the service area to use amalgam separators would decrease the amount of mercury in the waste stream. Amalgam separators would be preferred for Edmonds because of the costs of mercury removal treatment processes. The City has already begun a campaign to reduce these discharges, but results are not yet known.

Mercury emission removal equipment, such as that provided by Kombisorbon® would remove 99% of mercury, dioxins, furans and more. The system works by directing the flume gas through a sulfur impregnated activated carbon filter. The adsorbent (activated carbon) can be divided into several layers and removes mercury in all forms through adsorption and chemical reactions. The removal system includes a dust protection layer to extend the life of the activated carbon. The service life of the dust protection and adsorbent layers is estimated to be 3 to 4 years. A budgetary proposal has been received for the Edmonds facility and the system would cost about $1.4 million. Dust protection and adsorbent material replacement cost is roughly $30,000.

Before any actions are further considered Edmonds needs to perform at least one more stack test. The incinerated solids may have changed dramatically due to plant influent changes. The estimated cost to conduct these annual tests is about $25,000.

8.7.2 Secondary Bypass

The Edmonds treatment plant has the ability to route peak flows around the secondary treatment units (aeration basins and secondary clarifiers). The plant has never used this bypass, and the flow projections shown in Table 8.1 predict that the future peak day flow will not exceed the plant peak day design capacity of 21.5 mgd. Therefore the current permit does not allow for bypassing and blending of secondary effluent. However, for long-range planning purposes this may be necessary in the future.

The practice of bypassing peak wet weather flows around secondary treatment processes, and blending the bypass with secondary effluent, has been commonly used in the past throughout the US. In recent years this practice has become more controversial, and the EPA was asked to formalize a bypass regulation that specifically authorizes these bypasses. In December, 2005 the EPA published the provisions that allow for bypasses in the Federal Register at 40 CFR 122.41(m). The key provisions include:

- Discharges must meet secondary effluent limitations, including the 85% removal requirement, or any other more stringent requirements that are necessary to meet water quality standards
- All flows diverted from secondary treatment units must receive a minimum of primary treatment and any supplemental treatment or technology shown to be feasible. The policy does not authorize diversions around any other treatment units, including primary treatment units
- The availability of feasible alternatives will be determined on a plant-by-plant basis, and the authority to bypass the secondary process will be incorporated into the plant's NPDES permit.
- The permittee is responsible for submitting a comprehensive analysis of the feasibility of eliminating the secondary bypass
- If the DOE determines that there is no feasible alternative to secondary bypass flow diversion, then they may approve secondary flow diversion

8.7.3 Total Nitrogen Discharge Limits

Nitrogen is a nutrient which is believed to be one of the main causes of oxygen depletion in South Puget Sound (south of Tacoma Narrows). As a result, the Department of Ecology is conducting a TMDL Study of all of the sources of nitrogen entering Puget Sound (including the effects from discharges north of the Narrows). Ecology is adding nitrogen monitoring requirements to all permits for plants discharging to Puget Sound, in order to gather data for the study.

Although not imminent, for long-range planning purposes, consideration should be given as to how Edmonds plants would meet a future total nitrogen limit.

Total nitrogen (TN) removal is normally accomplished by biological nitrification and de-nitrification, just as carbonaceous BOD removal is currently accomplished in the

aeration basins. However, the slower growing nitrifying micro-organisms require about three times the minimum detention time that is recommended for carbonaceous BOD removal. In addition anoxic (without dissolved oxygen) basins are needed to provide biological de-nitrification. De-nitrification is the conversion of nitrates to nitrogen gas through bacteria stripping the nitrates of their oxygen; the nitrogen gas then releases to the atmosphere.

The total additional tankage required would be about 6 million gallons. The only space available for new aeration and anoxic basins would be to expand the plant to the parking lot across 2nd Avenue S. east of the facility; which is the facilities property. This site is not large enough to accommodate conventional activated sludge tanks

Edmonds other option would be converting the plant's activated sludge process to a membrane bioreactor (MBR) system. This choice is the most logical for plants with space restraints. Whereas conventional activated sludge plants operate at a mixed liquor suspended solids (MLSS) concentration of 2,000 to 4,000 mg/L, MBRs operate at a concentration of 8,000 to 12,000 mg/L. This higher concentration reduces the required aeration basin size proportionately, so the required basins would be reduced to about 2.0 million gallons, or about the volume of the existing aeration basins.

In addition, with the MBR process the liquid and solids are separated by a membrane, not by gravity settling, so the need for secondary clarifiers is eliminated. This, in turn, would allow space for the required membrane basins and membrane support building. Additionally the MBR plant would have to improve the headworks screening for the MBR system. Screening requirement is 3 mm (1/8") sized openings, current bar screens have 6 mm (1/4") openings.

8.8 PLANT IMPROVEMENTS AND ADDITIONAL NEEDS

8.8.1 Improvements since 2006 Comprehensive Plan

Since the 2006 Comprehensive Plan, the City has completed or is in the process of completing the following improvements at the WWTP.

1. 2007-Electrical Improvement Project. #C-251
    i. Replace the three main switch gear breakers with draw-out style breakers to allow us to service the breakers without a total plant power outage.
    ii. Add a 600 amp breaker to the "B" side distribution panel for a feeder to the 100 building.
2. 2007-MCC Feeder Installation. #M-009
    i. Added a new MCC to the 100 building for the new screenings equipment and to move some of the load from the existing MCC

due to under size cables between the existing MCC breaker and the MCC bus bars.

3. 2007-Screenings System Improvement. #C-161
    i. Replaced the influent bar screens with Headworks bar screens (3).
    ii. Replaced the screenings pump with two Wemco pumps.
    iii. Modified the screenings hopper feed water to use raw sewage from the influent pumps
    iv. Added flow meters on the hopper make up water and the screenings transfer flow.
    v. Added a JWC Macho Monster grinder between the screenings conveyer and the screenings hopper.
    vi. Replaced the old screenings de-watering unit with a Headworks washer compactor.
4. 2009-Odor Control Improvement Project. #C-311
    i. Install duct work, a VFD controlled fan, and carbon scrubber on the three Aeration Basins.
    ii. Install duct work, a two speed fan and a carbon scrubber on the secondary clarifier #2.
    iii. Enclose secondary clarifier #2
    iv. Remove the ventilation louvers and the window between the incinerator room and the belt press room.
    v. Install two fans and duct work to bring outside air into the belt press room.
    vi. Install a fan and duct work to allow us to route the foul air from the Waste Activated Sludge (WAS) storage tank to the incinerator while the incinerator is running. Or route it to the chemical scrubber when the incinerator is down
    vii. Added duct work to route the air from the Raw Sludge storage tank through fan #FIC-654.
5. 2009-Secondary Clarifier #2 Refurbishment. #C-316
    i. Strip and repaint all the steel in secondary clarifier #2.
6. 2009-Clay Feeder Project. #C-317
    i. Install a platform over the Sludge Hopper in the incinerator room.
    ii. Install a kaolin clay feeder on the platform that will feed Kaolin clay into the sludge hopper.
    iii. Install a control panel for the feeder with a VFD and timers for the vibrator.
    iv. This system allows us to control the undesirable effects of high sodium content in the sludge. When we feed clay we can control the melting point of the ash.

7. 2009-Aration Basin Control Up-grade. #M-050
    i. Install new Dissolved Oxygen probes on all three Basins.
    ii. Install new Total Suspended Solids probes on all three basins.
    iii. Install three instrument transmitters and three radio transmitters on the basins.
    iv. Install a radio receiver in the CP-301 and hook it into the Programmable Logic Controller (PLC).
    v. Program the PLC to trend the TSS of the basins.
8. 2010-Energy Efficiency Up-grade. #C-322
    i. Replace the course air diffuser in the WAS storage tank with Sanitair membrane style fine bubble diffusers.
    ii. Replace the centrifugal aeration blower 304 with a high efficiency turbo style blower.
9. 2010-300 PLC Upgrade. #C-328
    i. Replace the old Input/Output (I/O) PLC cards with new model cards.
10. 2010-Sludge Pump Replacement. #M-054
    i. Replace air operated RAW Sludge Transfer pump #RST-608 with an electric driven duel diaphragm Penn Valley pump. This will save electricity usage by reducing the demand on the air compressors.
11. 2011-Lighting Up-grade. C-366
    i. Replace all the florescent lighting and some outside lighting with high efficiency lighting.
    ii. Install motion sensors in various locations around the plant.
12. 2011-Outfall Diffuser Project. #C-367
    i. Have the diffuser orifice plates removed to allow less head lose through the diffusers
    ii. Perform a new mixing zone analysis.
13. 2012-A Basin Up-grade. #C-365
    i. Remove all the diffusers and piping grids in Aeration Basin #1.
    ii. Install two baffle walls to convert the complete mix basin to a plug flow basin.
    iii. Install Sanitair's new panel style diffusers.
    iv. Replace the existing single air control valve to the basin with two control valves, one on each grid section.
14. 2012-VFD Replacement. C-384
    i. Replace three, obsolete Variable Frequency Drives (VFD) with new VFDs.
    ii. Install two new VFDs on pumps DSP-615 and BDW-401.
15. 2012-Switch Gear Access Platform.

i. Install a platform over secondary clarifier #1 behind the plants main electrical switch gear to allow personnel access to the rear panels of the switch gear.

16. 2012-Fiber Optic Network. C-387
    i. Replace the existing plant PLC and SCADA network cables with Fiber Optic cable.
17. 2012-Non-Potable Water Pump Up-grade. C-322
    i. Replace one 50 HP non-potable water pump with a 30 HP pump and a VFD.
    ii. Install a booster pump, in the belt press room, for the high pressure applications,
18. 2012-Hypochlorite Pump Relocation. C-386
    i. Relocate the sodium hypochlorite pumps from the hypo room to the caustic storage area down stairs.
    ii. Install an uninterruptible power supply to the power circuit for the disinfection pumps
    iii. Add a fourth pump for disinfection.
19. 2012-Roof Replacement. C-383
    i. Replace aging roofs on buildings 100, 300, and 600.
20. 2012-Underground Storage Tank (UST) Monitoring Up-grade.
    i. Up-grade the level indicator on the UST to have the ability to perform statistical inventory control. This will bring us into compliance with the Department of Ecology.
    ii. Up-grade the leak monitoring system to a more reliable model.

8.8.2 Additional WWTP Improvements

Current or future modifications at the WWTP, due to obsolescence, operator preferences, or energy upgrades include the following (refer to Table 9.5):

WWTP-1 Switchgear Upgrade. The existing automatic transfer switch is corroded and failing. This improvement will insure reliable emergency power.

WWTP-2 Incinerator Testing and Compliance. Install new air emissions and monitoring equipment on the existing incinerator, modify pre-heat burner fuel source from diesel to natural gas and install a secondary heat exchanger to preheat air for plume suppression.

WWTP-3 Control System Upgrades. This work would begin in Building 600.

WWTP-4	Ameresco Energy Project. Replace the water feature pump and install a VFD. Install thermostat and controls on Shop heater. Evaluate replacement of Sludge Pump.
WWTP-5	Facility Improvements. This would include upgrades and expansion of the facilities, including the Men's Locker room.
WWTP-6	Variable Frequency Drive Upgrade. Replaces three old drives and installs two new drives
WWTP-7	Upgrade Flow Telemetry Equipment to improve data retrieval accuracy.
WWTP-8	Secondary Clarifier #3 Steel Coating, Weir washer and concrete coating and repair.
WWTP-9	Secondary Clarifier #1 Steel Coating, Weir washer and concrete coating and repair.
WWTP-10	Chlorine Contact Chamber Inspection and Coating.
WWTP-11	Diesel Day Tank. Obsolete day tank.
WWTP-12	Polymer Make up Equipment. Equipment has past its useful life.
WWTP-13	Unanticipated Plant and Operational Improvements and Repairs.
WWTP-14	Screenings Improvements. Evaluate options for better handling of screening materials.
WWTP-15	Belt Filter Press Energy Project. Evaluate the best solids handling options to maximize solids capture and cake.
WWTP-16	Convert 200 HP Blower to Turbo Blower. Energy saving measure.
WWTP-17	Upgrade Heat Pumps in Building 700. Energy saving measure
WWTP-18	Upgrade the Control Valve Actuators on the Effluent Pumps.
WWTP-19	Automatic Flow Shearing Process. Energy Saving measure.
WWTP-20	Recoat Primary Clarifier #1 Steel Equipment and Concrete Repair.
WWTP-21	Chemical Use Area. Improve access to eyewash and maneuverability.

CHAPTER IX – COMPREHENESIVE PLAN AND CAPITAL IMPROVEMENTS

9.1 CAPITAL IMPROVEMENT PROJECTS RANKING

Three major components make up the Capital Improvements Program (CIP), 1) those reoccurring maintenance issues, 2) that infrastructure that has known deficiencies or integrity issues and 3) that infrastructure that needs to be upsized resulting from population growth and the associated increase in flow values. Together these three components comprise the CIP. The City has an extensive and detailed categorization of the entire system.

Each fault/problem was assigned a point value which reflects the City staff's assessment and judgment. The City has three main categories of deficiencies:

a) the Red Area, which are chronic O&M issues that require the frequent and repeated attention of the City O&M Staff. The City has identified line segments that require regular flushing. This flushing schedule prioritizes the severity of the condition by the frequency of flushing. The location of these segments is presented in Appendix F.1 and also included in the I&I Study. Reportedly some problem segments have been removed from the trouble list due to actions implemented by the maintenance staff. The source of many of these problems stem from either low flow or grease accumulations. In the latter case, most of the property owners have been notified of pre-treatment requirements and the City's Fats, Oils and Grease policy.

b) the Granite system. Areas of know deficiencies have been identified through the City's Granite Software. This is a very comprehensive listing of known problems. These problems are categorized using approximately 28 descriptors. These descriptors have been aggregated into issues that are O&M in nature and which generally are individually minor, but collectively may warrant a CIP. The second Granite category are those CIP that could be rectified using trenchless technologies and the last category are those issues that likely would require major construction including digging up and replacement of the line segment.

c) Capacity Issues. With forecasted population and development, the anticipated future flows were applied to the existing piping infrastructure to determine which pipes are currently or, in the future, will be over capacity and surcharging the system.

A comprehensive listing of the Capital Improvement Projects considered all three of these factors. Isolated reports of minor faults or problems generally do not warrant a CIP. However, when several reoccurring maintenance issues are found in a single pipe reach, that segment might become a candidate for replacement or repair. Consequently, all faults/problems have been listed by pipe reach to aggregate the

problem areas. The detailed presentation of the individual problems is listed in Appendix F (Tables F.1 – Red Areas; Table F.2 – Granite O&M segments; Table F.3 – Granite Known Deficiencies-Trenchless; Table F.4 – Granite Known Deficiencies-Dig up and Replace).

The assignment of points is summarized in Table 9.1

TABLE 9.1
Point Assignment for Capital Improvement Projects

Category	Red Areas	Granite - O&M	Granite - Trenchless	Granite - Dig up and Replace	Capacity
Grease	5				
Dirt, Grease, Grit	5				
Girt	5				
Black Water	5				
None	0				
Grit, Black Water	5				
Grit (a lot)	6				
N/A	0				
Clean Flume		1			
Brush Sensor		1			
Depressions in Pipe		4			
Problem Laterals - Abandoned		6			
Debris and Deposits		0			
Grease - Medium		0			
Problem Laterals - Connections		5			
Medium Root Problems		2			
Light Root Problems		1			
Roots		1			
Joint Gasket Exposed - Severe		2			
Problem Joint - Offset Medium		2			
Joint Separation - Medium		2			
Joint Separation - Small		1			
Joint Separation		1			
Crack			5		
Heavy Root Problem			3		
Hole in Pipe - Medium			9		
Hole in Pipe - Small			8		
Hole in Pipe			8		
Joint Separated - Large			3		
Infiltration in Joint			5		
Deformed				7	
Broken				4	
Broken Hole				4	
Pipe Repair				10	
Hole in Pipe - Large				10	
Joint Offset - Large				3	
Capacity - Model					10
Known Surcharging Pipe Segments					20

These point assignments were made to each fault/problem and then summed by pipe segment. Ranking of the most severe segments were done both including and excluding the 'Granite-O&M' problems. Both rankings are listed in Appendix F (Table F.6 – All categories and Table F.7 – without Granite O&M). The pipe segment ranking presented in Table 9.2 represents the ranking without the 'Granite-O&M' components. This table identifies only the top ranked projects that are expected to be funded in the 6-year funding window. The ranking of all projects is presented in Table F.7. It was felt that this ranking best reflects the problems that can be resolved by a CIP project. The exclusion of the 'Granite-O&M' problems were viewed to be reoccurring maintenance issues such as flushing and root cutting and were viewed as maintenance issues that are not easily solved with a CIP. Those areas will require continued vigilance and follow up to intercept fats, oils and grease before they enter the City's system. Those problems noted to have 'low flow' are typically associated with new developments that have not completely built out. With time, these problems may resolve themselves without a CIP.

In addition, there were other Granite descriptors that were entries which were unassociated with any deficiency. These codings included camera out of water, cleanout, continue against flow, continue with flow, continue TV after jetting, end of pipe, end of push camera, end of run, infiltration, inside drop, lateral, outside drop, pipe continue, pipe diameter change, pipe direction change, pipe type, start against flow, start with flow, status, stop, and TV from other end.

9.2 CAPACITY LIMITATIONS IN EXISTING LINES

Based on the future estimated population growth presented in Chapter 6 and the flow projections and modeling results found in Chapter 7, certain deficiencies were anticipated in the collection and conveyance system. The population projections and corresponding flow projections were based on four time periods: 2013 (current), 2019, 2033 and build out. The CIP is presented in three time periods: 2013 to 2019, 2019 to 2033 and lastly 2033 to build out. The identification of the capacity issues for each of these three periods is presented in Table F.5 (Appendix F).

The line capacity issues together with the other known and scheduled projects and are ranked on Table 9.2 and presented on Figure 9.1. These ranked projects total $10,244,475 to be spread over the five years between 2015 and 2019 or about $2,000,000 per year. From this pool of projects the City can prioritize, select and coordinate with other City projects. In addition to these identified projects, Table F.7 (Appendix F) has a long list of other projects, with lower rankings, from which the City could choose.

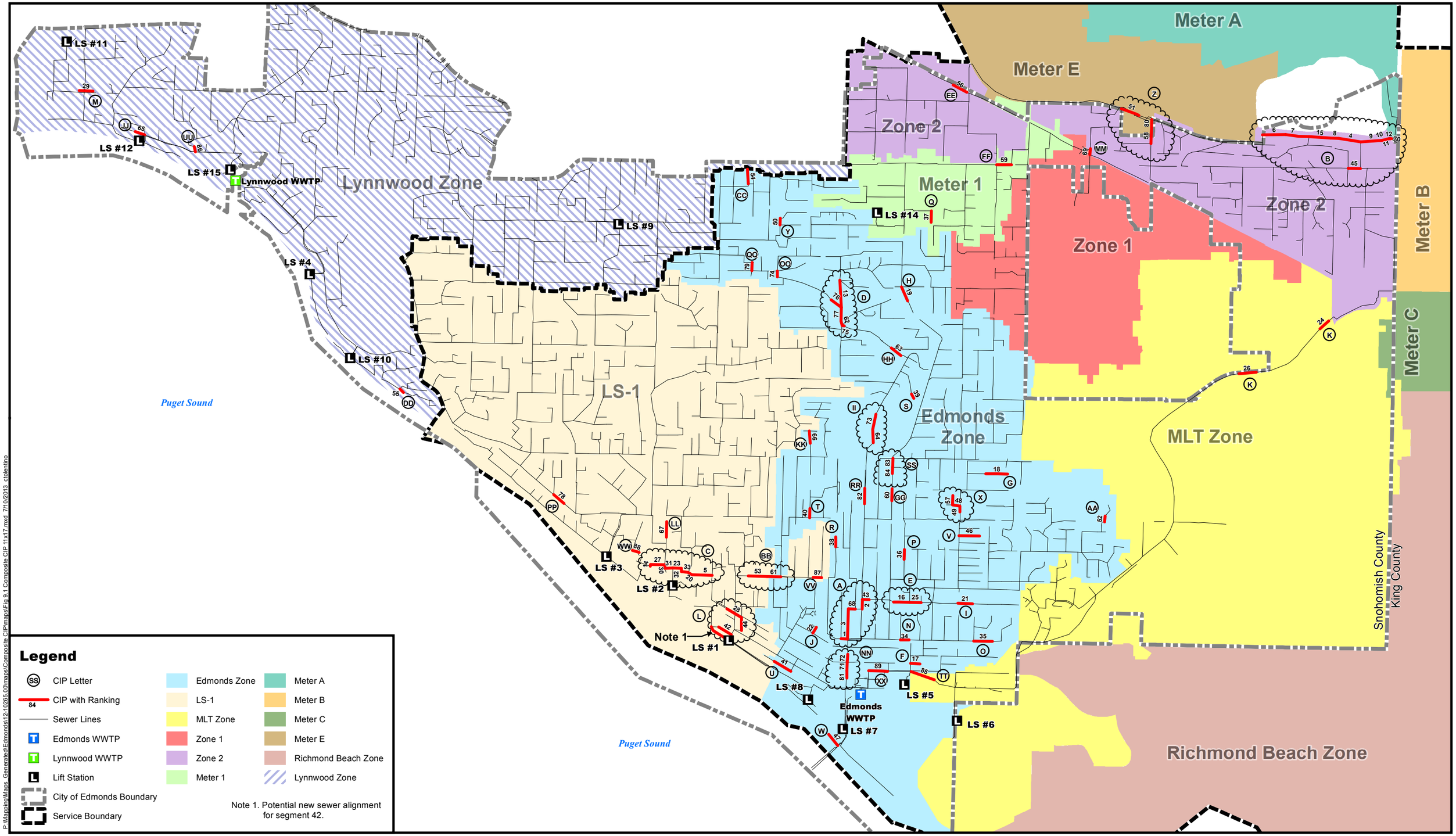
The more distant CIPs, such as those shown for 2019 to 2033 and 2033 to build out, are based on extended population and flow forecasts and will tend to be less precise. None-the-less, they are presented for informational purposes and as an indicator of future potential capacity issues while providing the level of service in Chapter 4.

Table 9.2
Ranking and Composite Capital Improvement Projects - Without Granite O&M Only

CIP Letter	Segment and Ranking Number	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Ranking and Point Assignment: Red Area	Granite - Trenchless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL	Granite O&M	Cost Estimate (see Appendix E)
A	Coll -1	Multiple Defects	8-75-8-57	144			0	38	0	0		38	0	
	Coll -2	Multiple Defects	8-50-8-52	213	Increase 10" to 12"	F.5	0	15	8	10		33	34	
	Coll -68	Multiple Defects	8-59-8-58	148			0	10	0	0		10	5	$ 309,842
	Coll -43	Multiple Defects	8-51-8-50	150	Increase 10" to 12"	F.5	0	5	0	10		15	4	
	Coll -3	Multiple Defects	8-58-8-57	657			0	30	0	0		30	176	
B	Coll -4	Multiple Defects	17-61-17-84	484	Increase 24" to 36"	F.5	0	0	0	10	20	30	28	
	Coll -6	Multiple Defects	17-47-17-48	500	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30	4	
	Coll -7	Multiple Defects	17-48-17-59	506	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30	4	
	Coll -8	Multiple Defects	17-60-17-61	179	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30	4	
	Coll -9	Multiple Defects	17-84-17-85	457	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30	4	
	Coll -10	Multiple Defects	17-85-17-86	111	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30	4	$ 2,113,193
	Coll -11	Multiple Defects	17-86-17-87	43	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30	4	
	Coll -12	Multiple Defects	17-87-17-88	35	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30	4	
	Coll -15	Capacity - Model	17-59-17-60	463	Increase 24" to 36"	F.5	0	0	0	10	20	30		
	Coll -45	Multiple Defects	17-78-17-82	266	Longitudinal - Wider (8" - 12")	F.2 and F.5	0	5	0	10		15	0	
	Coll -70	Multiple Defects	17-88-17-89	19	Increase 24" to 36"	F.1 and F.5	0	0	0	10		10	4	
C	Coll -5	Multiple Defects	8-265-8-266	438	Increase 15" to 21"	F.5	0	0	0	10	20	30	6	
	Coll -14	Multiple Defects	8-244-8-243	305	Increase 10" to 12"	F.5	0	0	0	10	20	30	3	
	Coll -20	Multiple Defects	8-249-8-265	98			0	3	0	0	20	23	1	
	Coll -23	Roots	8-246-8-247	180		F.1	0	0	0	0	20	20	1	
	Coll -27	Multiple Defects	8-243-8-242	305	Increase 10" to 12"	F.5	0	10	0	10		20	0	$ 736,038
	Coll -30	Observed Surcharge	8-242-8-245	78							20	20		
	Coll -31	Observed Surcharge	8-245-8-246	173							20	20		
	Coll -32	Observed Surcharge	8-247-8-248	71							20	20		
	Coll -33	Observed Surcharge	8-248-8-249	147							20	20		
D	Coll -13	Multiple Defects	9-224-9-202	591	Increase 8" to 15"	F.5	10	10	0	10		30	4	
	Coll -62	Multiple Defects	9-20-9-19	268	Increase 10" to 15"		0	0	0	10		10	8	
	Coll -75	Multiple Defects	9-19-9-18	50	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10	4	$ 547,117
	Coll -76	Multiple Defects	9-201-9-202	280	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10	4	
	Coll -77	Multiple Defects	9-202-9-20	299	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10	4	
E	Coll -16	Multiple Defects	12-75-8-14	349			0	0	28	0		28	0	$ 355,687
	Coll -25	Multiple Defects	12-73-12-75	247	Increase 8 to 12"	F.3 and F.5	0	0	10	10		20	0	
F	Coll -17	Multiple Defects	11-8-11-7	207			0	26	0	0		26	12	$ 44,693
G	Coll -18	Multiple Defects	12-143-12-142	475			0	25	0	0		25	5	$ 104,450
H	Coll -19	Multiple Defects	13-53-9-212	325			0	25	0	0		25	4	$ 43,802
I	Coll -21	Multiple Defects	12-109-12-110	319			0	20	0	0		20	5	$ 29,193
J	Coll -22	Multiple Defects	8-332-8-331	144			0	20	0	0		20	5	$ 23,531
K	Coll -24	Multiple Defects	16-128-16-129	252	Increase 24" to 36"	F.3	0	0	10	10		20	0	$ 620,525
	Coll -26	Multiple Defects	16-133-16-134	379	Increase 24" to 36"	F.3 and F.5	0	0	10	10		20	0	
L	Coll -28	Multiple Defects	8-280-8-281	371	Increase 15" to 21"	F.5	0	10	0	10		20	0	
	Coll -42	Multiple Defects	8-285-8-284	319			0	15	0	0		15	5	$ 506,839
	Coll -44	Multiple Defects	8-281-8-282	281	Increase 15" to 21"	F.5	0	5	0	10		15	1	
M	Coll -29	Multiple Defects	1-55-1-52	297			0	0	20	0		20	0	$ 149,270
N	Coll -34	Multiple Defects	12-84A-12-83	189			0	5	14	0		19	10	$ 92,363
O	Coll -35	Multiple Defects	12-101-12-95	406			0	5	14	0		19	2	$ 206,654
P	Coll -36	Multiple Defects	12-49-12-50	220			0	8	10	0		18	0	$ 122,160
Q	Coll -37	Multiple Defects	13-22-13-22A	247			0	18	0	0		18	0	$ 37,898
R	Coll -38	Multiple Defects	8-68B-8-68	217			0	17	0	0		17	2	$ 48,491
S	Coll -39	Multiple Defects	12N-79-13-65B	109			0	3	14	0		17	0	$ 63,942
T	Coll -40	Multiple Defects	8-107-8-106	201			0	10	6	0		16	6	$ 115,289

Table 9.2
Ranking and Composite Capital Improvement Projects - Without Granite O&M Only

CIP Letter	Segment and Ranking Number	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Ranking and Point Assignment: Red Area	Granite - Trenchless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL	Granite O&M	Cost Estimate (see Appendix E)
U	Coll -41	Multiple Defects	7-79-7-80	419			0	15	0	0		15	30	$ 158,717
V	Coll -46	Multiple Defects	12-126-12-125	443			0	15	0	0		15	0	$ 170,957
W	Coll -47	Multiple Defects	7-9-7-10	304			0	14	0	0		14	15	$ 115,879
X	Coll -48	Multiple Defects	12-134-12-132	159			0	14	0	0		14	2	
	Coll -49	Multiple Defects	12-132-12-131	129			0	14	0	0		14	0	$ 127,173
	Coll -57	Multiple Defects	12-133-12-134	197			0	0	10	0		10	16	
Y	Coll -50	Multiple Defects	9-299-9-298	145			0	3	10	0		13	6	$ 39,790
Z	Coll -51	Multiple Defects	14-56-14-62	406	Increase 12" to 18"	F.5	0	3	0	10		13	2	
	Coll -58	Multiple Defects	14-66-14-65	348			0	10	0	0		10	16	$ 189,931
	Coll -80	Multiple Defects	14-65-14-64	175			0	0	10	0		10	4	
AA	Coll -52	Multiple Defects	12-248-12-247	128			0	13	0	0		13	0	$ 23,239
BB	Coll -53	Multiple Defects	8-136-8-137	401			0	12	0	0		12	14	$ 48,578
	Coll -61	Multiple Defects	8-135-8-316	96			5	5	0	0		10	9	
CC	Coll -54	Multiple Defects	9-363A-9-363	318			0	12	0	0		12	8	$ 38,492
DD	Coll -55	Multiple Defects	14-3-14-3A	105			0	9	3	0		12	0	$ 27,890
EE	Coll -56	Multiple Defects	2-113A-2-113	336			0	11	0	0		11	1	$ 52,922
FF	Coll -59	Multiple Defects	14-34-14-33	328	Increase 10" to 12"	F.5	0	0	0	10		10	13	$ 108,920
GG	Coll -60	Multiple Defects	8-4-8-5	262	Increase 8" to 12"	F.5	0	0	0	10		10	12	$ 154,225
HH	Coll -63	Multiple Defects	9-11-9-10	268	Increase 10" to 15"	F.5	0	0	0	10		10	6	$ 160,101
II	Coll -64	Multiple Defects	8-35-8-36	287	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10	5	$ 290,138
	Coll -73	Multiple Defects	8-34-8-35	334	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10	4	
JJ	Coll -65	Multiple Defects	1-36A-1-36	214			0	0	10	0		10	5	$ 109,761
KK	Coll -66	Multiple Defects	8-114-8-113	269			0	0	10	0		10	5	$ 137,041
LL	Coll -67	Multiple Defects	8-240-8-239	336			0	10	0	0		10	5	$ 43,021
MM	Coll -69	Multiple Defects	14-48-14-50	130	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10	4	$ 114,781
NN	Coll -71	Multiple Defects	7-47-7-50	187	Increase 12" to 18"	F.1 and F.5	0	0	0	10		10	4	
	Coll -72	Multiple Defects	7-48-7-47	166	Increase 12" to 18"	F.1 and F.5	0	0	0	10		10	4	$ 330,952
	Coll -81	Multiple Defects	7-50-7-52	159			0	10	0	0		10	4	
OO	Coll -74	Multiple Defects	9-193-9-196	128	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10	4	$ 38,164
PP	Coll -78	Multiple Defects	4-163-4-162	295	Increase 10" to 12"	F.5	0	0	0	10		10	4	$ 109,250
QQ	Coll -79	Multiple Defects	9-188-9-189	174	Increase 8" to 12"	F.5	0	0	0	10		10	4	$ 53,872
RR	Coll -82	Multiple Defects	8-41-8-42	332	Increase 8" to 15"	F.5	0	0	0	10		10	3	$ 222,590
SS	Coll -83	Multiple Defects	8-2-8-2A	197	Increase 8" to 12"	F.5	0	0	0	10		10	2	$ 190,375
	Coll -84	Multiple Defects	8-2A-8-3	134	Increase 8" to 12"	F.5	0	0	0	10		10	2	
TT	Coll -85	Multiple Defects	11-19-11-18	526	Increase from 24 to 42	F.5	0	0	0	10		10	1	$ 362,003
UU	Coll -86	Multiple Defects	3-12F-3-12E	116			0	0	10	0		10	1	$ 56,142
VV	Coll -87	Multiple Defects	8-97-8-98	186			0	10	0	0		10	1	$ 20,920
WW	Coll -88	Multiple Defects	4-83-4-82	150	Increase 10" to 12"	F.1 and F.5	0	0	0	10		10	0	$ 49,610
XX	Coll -89	Multiple Defects	7-33-7-32	441	Increase 30" to 42"	F.1 and F.5	0	0	0	10		10	0	$ 428,064
TOTAL														$ 10,244,475



P:\Mapping\Maps_Generated\Edmonds\12-10265.00\maps\Composite CIP\maps\Fig 9.1 Composite CIP 11x17.mxd 7/10/2013 ctolentino

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Capacity Limited Pipes: Aqualyze Inc., June 2013
Sewer Zones: City of Edmonds, December 2011
GIS Data: City of Edmonds, Snohomish County & King County.
Data sources supplied may not reflect current or actual conditions. This map is a geographic representation based on information available. It does not represent survey data. No warranty is made concerning the accuracy, currency, or completeness of data depicted on this map.

NORTH

0 1,000 2,000 4,000 Feet

Scale in Feet

COMPOSITE CIP

COMPREHENSIVE SEWER PLAN
City of Edmonds
July 2013

Figure
9.1

9.3 BASIS FOR CIP COSTS ESTIMATES

Construction cost estimates were prepared for most of the CIP projects listed in Table 9.3. Documentation for these estimates can be found in Appendix E. Those projects that do not have supporting cost estimates are based on actual bid amounts or detailed cost estimating done during the design phases. Certain assumption needed to be made in terms of quantities and unit prices. Those assumptions are presented below.

Several unit price items were used to determine the cost estimates. Quantities were estimated for each item and unit prices were estimated from recent bid results. An estimated construction cost was developed for each project including contingencies and sales tax. Total project costs were then estimated for each improvement. All costs are 2013 dollars and summarized on Table 9.3.

CONSTRUCTION ESTIMATES-ASSUMPTIONS

- 10% of the construction costs are Mobilization.
- Traffic control at $5/LF of mainline sewer.
- Trench dewatering estimated at $5/LF.
- Sheeting, shoring and bracing estimated at $5/LF.
- Saw cutting along both sides of the trench estimated to be required for the entire length of the mainline sewer.
- Pavement removal is limited to a trench width of 60 inches, plus an allowance of 12 inches on both sides of the trench, for a total width of 84 inches.
- Temporary sewer bypass estimated to be $5/LF for all cut and cover installations.
- Import trench backfill is estimated based on the assumption that 50% of all excavation will require imported material. Maximum width is 60 inches and an average depth of 8 feet.
- Crushed surfacing, base course is assumed to be 8 inches deep and a maximum pay width of 84 inches.

TABLE 9.3 Capital Improvements Projects										
Sub-Basin	Description	CIP No.	2013 - 2019 (2013 Dollars)							
			2013	2014	2015	2016	2017	2018	2019	2012 - 2019 Total
Collection System (See Appendix E for Cost Estimates)										
	2012 Sewer Replacement / Rehab Improvements		$350,000	$849,029						$1,199,029
	2013 Sewer Replacement / Rehab Improvements		$120,000	$1,807,767						$1,927,767
	2014 Sewer Replacement / Rehab Improvements			$191,262						$191,262
	City-wide Sewer Improvements			$33,981						$33,981
	City-wide CIPP Sewer Rehabilitation		$302,600	$436,893						$739,493
	Meter Installation Basin LS-01		$72,600							$72,600
	Meter Installations Basin Edmonds Zone			$19,417						$19,417
	Smoke Test in Basin LS-01		$75,000							$75,000
	Comprehensive Sewer Plan		$99,100							$99,100
	2015 Sewer Replacement / Rehab Improvements				$2,000,000					$2,000,000
	2016 Sewer Replacement / Rehab Improvements					$2,000,000				$2,000,000
	2017 Sewer Replacement / Rehab Improvements						$2,000,000			$2,000,000
	2018 Sewer Replacement / Rehab Improvements							$2,000,000		$2,000,000
	2019 Sewer Replacement / Rehab Improvements								$2,000,000	$2,000,000
	Collection System Subtotal		**$1,019,300**	**$3,338,349**	**$2,000,000**	**$2,000,000**	**$2,000,000**	**$2,000,000**	**$2,000,000**	$14,357,649
PUMP STATIONS										
	Pump Station Rehabilitation (PS #3, 4, 5, 9, 10, 11, 12, 14, 15)		$4,822,810							$4,822,810
	Pump Station Subtotal		**$4,822,810**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$4,822,810**
Edmond WWTP										
	Switchgear Upgrade	WWTP-1	$1,297,724							$1,297,724
	Incinerator Testing and Compliance	WWTP-2	$100,000	$90,000	$850,000					$1,040,000
	Control System Upgrades	WWTP-3	$67,469	$250,000	$80,000	$80,000	$80,000	$80,000		$637,469
	Ameresco Energy Project	WWTP-4	$15,000							$15,000
	Facility Improvement	WWTP-5	$350,000							$350,000
	Variable Frequency Drive upgrade	WWTP-6	$25,000							$25,000
	Upgrade Flow Telemetry Equipment	WWTP-7	$15,000	$10,000						$25,000
	Secondary Clarifier #3 Steel Coating, weir washer, concrete	WWTP-8		$175,000						$175,000
	Secondary Clarifier #1 Steel Coating, weir washer, concrete	WWTP-9				$125,000				$125,000
	Chlorine Contact Chamber Inspection and Coating	WWTP-10		$250,000		$250,000				$500,000
	Diesel Day Tank	WWTP-11		$6,000						$6,000
	Polymer Make Up Equipment	WWTP-12		$80,000						$80,000
	Unanticipated Plant and Operational Improvements/Repairs	WWTP-13		$50,000	$50,000	$50,000	$425,000	$750,000	$750,000	$2,075,000
	Screenings Improvements	WWTP-14		$20,000					$100,000	$120,000
	Belt Filter Press Energy Project	WWTP-15		$50,000	$20,000	$500,000				$570,000

TABLE 9.3 Capital Improvements Projects										
Sub-Basin	Description	CIP No.	2013 - 2019 (2013 Dollars)							
			2013	2014	2015	2016	2017	2018	2019	2012 - 2019 Total
	Convert 200 HP blower to Turbo Blower	WWTP-16					$350,000			$350,000
	Upgrade Heat Pumps in Building 700	WWTP-17					$50,000			$50,000
	Ugrade Control Valve Actuators on Effluent Pumps	WWTP-18					$35,000			$35,000
	Automatic Flow Shearing Process	WWTP-19					$35,000			$35,000
	Recoat Primary Clarifier #1 Steel Equipment/Concrete Repair	WWTP-20						$100,000		$100,000
	Chemical Use Area	WWTP-21							$125,000	$125,000
	Unspent Funds from 2012		$40,511							$40,511
	Subtotal EDMONDS WWTP		**$1,910,704**	**$981,000**	**$1,000,000**	**$1,005,000**	**$975,000**	**$930,000**	**$975,000**	**$7,776,704**
TOTAL COST			**$7,752,814**	**$4,319,349**	**$3,000,000**	**$3,005,000**	**$2,975,000**	**$2,930,000**	**$2,975,000**	**$26,957,163**

- Crushed surfacing, top course is assumed to be 4 inches deep and a maximum pay width of 84 inches.
- HMA is based on a maximum thickness of 3 inches applied over a width of 20 feet (1/2 road) for the entire length of all mainline sewers.
- Restoration is based on 5% of the construction subtotal.
- Cleanup and testing is based on 5% of the construction subtotal.
- Manholes - It is assumed that the terminal manholes will be salvaged and only the intermediate manholes will be replaced or modified.
- Lift station rehabilitation assumes that no excavation will be necessary and that the needed increase in the capacity can be accomplished with pump and motor changes, and electrical revisions.

ALLIED AND OTHER COSTS – ASSUMPTIONS

- 40% contingency to address pre-design level of cost estimating.
- 9.0% State Sales Tax.
- 12% of the estimated construction cost is for engineering design, survey, geotechnical investigation and permits.
- 7% of the estimated construction cost is for construction services.
- 2% of the estimated construction cost is for District Administration.
- 1 % of the estimated construction cost is for legal.

9.4 WASTEWATER REUSE

RCW 90.48.112 requires consideration of reclaimed water in wastewater plans. Although the law does not specifically require implementation of a reclaimed water alternative, it strongly encourages it. RCW 90.46.005 states in part that to the extent that reclaimed water is appropriate for beneficial uses, it should be so used to preserve potable water for drinking purposes.

9.4.1 Regulatory Requirements

Beneficial use of reclaimed water for irrigation of crops, supplemental stream or wetland flow enhancement, groundwater recharge, toilet and urinal flushing, etc. requires treatment to reclamation and reuse standards, which are more stringent than the conventional secondary standards required for surface water disposal using an outfall. The added treatment facilities required include effluent coagulation, filtration, additional disinfection and more treatment facility redundancy and reliability requirements.

The use of reclaimed water is permitted in the State of Washington, and is jointly regulated by the State Departments of Health (Division of Drinking Water); and Department of Ecology. The "*State of Washington Reclamation and Reuse Standards*", September, 1997 (Publication #97-23) provides the guidance for acceptable reclaimed water treatment and use. Under all reuse options, the proposal must demonstrate the beneficial uses being made of the reclaimed water. Membrane Bio-reactors (MBRs) are not specifically mentioned in this publication, though it has generally and widely been adopted as an acceptable treatment process meeting reuse standards.

The State Reclamation Standards define four levels of treatment required depending on the final use of the reclaimed water. Class A reclaimed water is the highest quality and can be utilized for any of the permitted uses. In addition to conventional secondary activated sludge treatment (oxidation and sedimentation), Class A reclaimed water requires coagulation, filtration, and disinfection to less than 2.2 total coliform per 100 ml, which is a very stringent disinfection standard. The MBR treatment process (with disinfection) will also produce Class A reclaimed water (with added disinfection), because the coagulation occurs within the activated sludge process itself and filtration is provided through the fine pore membranes.

Classes B, C, and D reclaimed water do not require filtration, and Class C and D have less stringent disinfection requirements. Use of these classes is generally restricted to irrigation of non-food crops (such as forest land) with restricted public exposure.

Because the most logical uses of this reclaimed water involve irrigation of golf courses and public parks, which are subject to human exposure, treatment to Class A reclaimed water standards is recommended.

In addition, the reclaimed water must be reliably generated. Emergency storage or alternative discharge options must be provided for upset conditions. Excess flow will continue to be discharged to Puget Sound.

The standards also require automatic alarms, treatment unit redundancy, and qualified operations staffing.

9.4.2 Potential Uses and Demand

While reuse of reclaimed wastewater treatment plant effluent is becoming more and more common, the demand for year-round reclaimed effluent in the Pacific Northwest is very limited, particularly in a suburban setting. Nevertheless, the City has made

accommodations for use of reclaimed water at the WWTP.

In assessing the potential use of Class A reclaimed water, sites were identified for irrigation and/or industrial, commercial and public use. Irrigation can include parks, commercial nurseries, golf courses, and cemeteries. Industrial uses of reclaimed water can include boiler feed, cooling, process water, sewer flushing, and processing plant wash down. There were no industrial sites identified in the City's service area. Thus, the main uses of reclaimed water from the WWTP would be irrigation of open access areas.

This analysis looked at the top 25 water consumers in the City. Their water usage for the winter months of November through February was compared to the annual average water usage. If these top water users had significant irrigational uses, the difference would be evident when comparing these values. Oddly, only a handful of users exhibited increased irrigational demands of the City's domestic water supply. The most significant users were Swedish Hospital, the City of Lynnwood and 99 Ranch Market. These users actually reported either no increase in irrigational needs or a reduction in summertime uses. Consequently the volume of irrigational demands within a three mile radius of the plant is relatively small as presented in Table 9.4.

TABLE 9.4
Wastewater Reuse Demand

User	Average Annual Water Consumption 2007 -2011 (CCF)	Average Winter (Nov thru Feb) Water Usage, 2007 - 2011 (CCF)	Average Non-Winter usage (Mar - Oct), 2007 - 2011 (CCF)	Average Monthly Winter Water Usage (CCF)	Average Monthly Non-Winter Water Usage (CCF)	Estimated Irrigational Monthly Demand (CCF)
Highland Park Condominiums	4,782	1,253	3,529	313	441	128
Tops Foods	7,459	1,945	5,514	486	689	203
Edmonds School (1)	5,491	1,450	4,041	363	505	143
Park Ballinger Apartments	4,557	1,495	3,062	374	383	9
TOTAL						483

Note 1. The Edmonds School values are likely skewed since the schools are largely unused during the summer months

9.4.3 Reclaimed Water Treatment Facilities at WWTP

Effluent Quality

The effluent produced by the City's WWTP would likely require an effluent filter added to the last stage of a secondary treatment process to meet the Class C reclaimed water standard. This system could potentially be designed within the space constraints at the WWTP.

It is assumed that the reclaimed water will be pumped to off-site irrigation users, and that no on-site storage will be provided.

9.4.4 Reclaimed Water Conveyance and Distribution

Conveyance Alternatives
Conveyance of reclaimed water by pumping is the only logical and practical conveyance method.

Truck hauling could be considered for other general uses, such as sewer flushing, street washing, dust control, roadside planter watering, etc. But this expected volume of usage is likely to be very small.

Conveyance and Distribution Facilities
The conveyance of reclaimed water from the WWTP would require a pump station and 27,200 feet of 4" diameter force main.

9.4.5 Economic Analysis of Reuse

A present worth factor of 12.46 based on 5% interest rate and 20-year project life is used for economic analysis.

Estimated Capital Cost of Treatment and Conveyance

Site work	$100,000
Reclaimed water booster station	400,000
Conveyance	900,000
Distribution	350,000
Subtotal	$1,750,000
Contingencies @ 40%	700,000
Subtotal	$2,450,000
State Sales Tax @ 9.0%	220,000
Total Construction	$2,670,000
Engineering @ 12%	$320,000
Construction Management @ 7%	190,000
City Administration @ 2%	53,000
Legal @ 1%	27,000
Total Capital	$3,260,000
Amortized Annual Capital Cost	$262,000

Estimated Annual O&M Cost of Treatment and Conveyance

Treatment & Conveyance	
Chemicals	$6,000
Electricity	1,000
Equipment maintenance and replacement	12,000
Labor	40,000
Total Annual O&M Cost	$59,000

Total Annual Cost	**$321,000**

Based on an average monthly usage of 483 CCF or a total of about 2,898 CCF during a six month period during the year. At $2.30/ccf, the annual of cost of water is only $6,700. The cost of conveying reclaimed water for irrigational uses does not financially make sense.

CHAPTER X – OPERATIONS AND MAINTENANCE PROGRAM

10.1 CITY MANAGEMENT AND PERSONNEL

The City's Public Works & Utilities Department is composed of approximately 75 full time positions that are organized into seven distinct divisions. The division heads report to the Public Works Director who is responsible for the overall management of the Department.

10.1.1 Organization

Two divisions of the Public Works & Utilities Department have specific functions that are vital to the inner workings and function of the wastewater utility. These divisions work independently, yet cooperatively, in a symbiotic relationship with one another.

The City's sewer collection system is under the general management of Jim Waite. The City's wastewater treatment plant is under the general management of Pamela Randolph. Additional employees of the Public Works & Utilities Department within the Engineering Division and Administration Division which provide tertiary support to the Sewer Section of the Water/Sewer Division and Wastewater Treatment Plant Division are not accounted for in the above employment numbers.

10.1.2 Certification and Training

The City encourages its employees to obtain certification and training for skills relevant to operating and maintaining the sewer system. All staff must, at a minimum, have the following:

- A high school diploma or GED.
- A driver's license.

In addition, the City provides employees with opportunities for training and certification relative to their position function. Each staff member annually receives some training. Depending on the employee's function, training may include safety, confined space entry, record keeping, pump station electrical and instrumentation, pump station operation, public relations, vactor truck operations and emergency response. Training is provided in varying mixes of the following categories:

- Manufacturer training by various equipment suppliers and representatives.
- On-the-job training in the field, the shop, or in the office.
- In-house class room training.

- Industry-wide training at conferences and seminars away from the City.

To promote the improvement of its employees, the City may elect to pay for annual certification fees, employee time and tuition during certification training courses and provides time off for certification testing. The City also provides staff opportunities to receive the continuing education necessary to maintain certification. Professional growth requirements for certification are met through continuing education units (CEU).

10.2 OPERATIONS AND MAINTENANCE ACTIVITIES AND PROGRAMS

This section presents the operations and maintenance activities, including preventive and corrective routines, procedures and wastewater related programs.

10.2.1 Collection System Maintenance

10.2.1.1 Lift Stations

The City has a two-person crew that is dedicated to lift station maintenance and incident response. This crew visits every lift station a minimum of once per week. Those stations that are older or that have a tendency to be a source of problems are visited more frequently.

The emergency generators are exercised a minimum of once per month. That frequency increases to twice per month during the winter months. Typically the generators are exercised for a 1 to 2 hour period.

Approximately half of the wet wells are washed down every month. These wet wells are those that have a high incident of grease accumulation. The remaining wet wells are washed down on a bi-monthly frequency.

10.2.1.2 Sanitary Sewers

The City's staff has established a plan to conduct regular internal inspection (closed circuit televising) of 680,000 linear feet of pipeline. The established schedule is to complete about 33% each year. The digital records of these inspections are reviewed by the technicians and any segment that is identified as needing repair, sliplining or replacement is noted. Similarly, those segments that are structurally sound, but in need of routine attention are also tracked and, if warranted, added to the 'frequent flushing' list. Those lines that have deficiencies are logged and tracked on Granite, the City's O&M tracking software.

The lines that have been previously identified as needing routine maintenance and flushing are identified in Appendix F.

The staff is also alert to the potential of odor concerns, though odor complaints in the collection system are extremely rare.

The crews will also hydraulically jet the lines at the time of internal inspections if needed. Additionally, there are designated areas that are chronic maintenance problems that are more frequently cleaned. In some cases, the cleaning is conducted as often as every three months.

10.2.2 WWTP Operations and Maintenance

The program maintenance protocol currently being used at the WWTPs consists of a system that tracks historical preventative maintenance measures for each piece of equipment. This system is the backbone of scheduling all preventative maintenance. All routine preventative maintenance like oil changes, lubrication and exercising of infrequently used equipment and corrective maintenance performed are chronicled on this record.

The plant staff does most of the repairs and rebuilds with in-house personnel. More complex tasks such as motor rewinding, electrical or instrumentation modifications are out sourced to a third party.

Critical equipment that could affect effluent quality has redundant and backup equipment 'on-the-shelf'. This redundancy allows the City to respond to equipment failures without effluent violations. With the backup equipment available the City currently does not routinely replace old equipment until such time as the maintenance efforts become burdensome and replacement is the prudent decision.

10.3 PROGRAMS

10.3.1 Pretreatment Program

The City, through Ordinance No. 3401, established pretreatment requirements for all non-residential dischargers into the City's system (see Appendix H). These standards include a general prohibition that disallows any discharge that would result in a pass through or interference with the Public Owned Treatment Works. The intent of this ordinance is to:

1. Prevent the introduction of pollutants into the POTW which will pass through the POTW inadequately treated, into the receiving waters or otherwise be incompatible with the POTW
2. Ensure that the quality of the POTW sludge is maintained at a level which allows its use and disposal in compliance with the applicable statues and regulations.
3. Protect the POTW personnel who may be affected by wastewater and sludge in the course of their employment and to protect the general public
4. Improve the opportunity to recycle and reclaim wastewater and biosolids from the POTW
5. Promote strategies that reduce the amounts of pollution generated by users, thereby reducing the associated hazards to the POTW and receiving waters.

This policy also contains a specific and detailed description of the prohibited substances. The following is a general summary of some, but not all, of those specific prohibitions:

- Any substance that is considered explosive and/or has a flashpoint of less than 140 degrees Fahrenheit.
- Any substance that may cause an obstruction to the flow in a sewer or at the plant. This includes garbage with particles greater than one-quarter inch (1/4"), waste from industrial processes including sludges, screenings, and pretreatment residues, animal guts or tissues, paunch manure, bones, hair, hides or fleshings, entrails, whole blood, feathers, ashes, cinders, sand, earth, gravel, coal, rubbish, spent lime stone or marble dust, metal, glass, straw, shavings, grass clippings, rags, spent grains, spent hops, waste paper, wood, plastics, gas, tar, asphalt residues, residues from refining, or processing of fuel or lubrication oil, mud, or glass grinding or polishing wastes.
- Any wastewater generally having a pH less than 5.0 or greater than 11.0
- Any wastewater containing petroleum oil, non-biodegradeable cutting oil or product or mineral oil origin
- Any noxious or malodorous substance
- Any substance that may result in toxic gases, vapors or fumes.
- Medical wastes
- Trucked or hauled pollutants (including Septage)
- Any sludges, screenings or other residues from pre-treatment wastes
- Substances that might result in biosolids to be unsuitable for reclamation
- Substances containing color such as stains, dyes, and paints
- Wastewater that is greater than 104 degrees Fahrenheit.
- Any amount of unpolluted water including non-contact cooling water, stormwater, and other indirect inflow sources.
- Wastewater causing effluent toxicity in an analytical test
- Wastewater containing radioactive wastes.
- Detergents and other substances that may cause foaming
- Any substance that may cause fire or explosion
- Any substance that would result in a violation of the City's NPDES permit.
- Any substance that may harm the sewer system or treatment equipment
- Any hazardous or dangerous waste as defined by WAC 173-303
- Persistent pesticides
- Slug loadings
- Fats, Oils and Greases interfering with the operation of the plant
- Metal concentrations must not exceed
    - Arsenic 0.36 mg/l
    - Cadmium 0.27 mg/l
    - Chromium 1.99 mg/l
    - Copper 2.98mg/l
    - Cyanide 0.29 mg/l
    - Lead 1.09 mg/l
    - Mercury 0.07 mg/l

- o Nickel 2.14 mg/l
- o Silver 1.44 mg/l
- o Zinc 5.13 mg/l
- o Non-polar FOGs 100 mg/l

- High strength dischargers of BOD, TSS and FOG are obligated to have special provisions that might restrict their rate of discharge or have specific pretreatment requirements.

The City's pretreatment resolution also defines the requirements for sizing and maintaining the grease traps and/or interceptors.

Failure to comply with the limitations and prohibitions presented above may result in the issuance of a Corrective Order and, if the directive of the corrective order is not followed, fines may be imposed on the violator.

10.3.2 Water Reclamation and Reuse

The current plant uses chlorinated effluent for wash down purposes within the plant. No offsite use is currently allowed. The plant does not meter wash down water, so the volume of reuse water is not known.

10.3.3 Biosolids Recycling

All biosolids generated at the plants are incinerated onsite. The ash is transported to the local transfer station which is then hauled to the landfill.

10.3.4 Sewage Spill Response Plan

Emergency response to reported sewage spills in the collection system are forwarded to the Water/Sewer Division. During non-business hours, the City has a rotating assignment among the staff to be on-call to respond to incidents 24 hours a day, 7 days per week.

Protection against accidental discharges of pollutants to the WWTP may prompt the director to require the violators to implement spill plans to prevent future discharges. When such plans are required by the director, they shall contain at least the following elements:

1. Description of discharge practices, including non-routine batch discharges;
2. Description of stored chemicals;
3. Procedures for immediately notifying the POTW of any accidental or slug discharge. Such notification must also be given for any discharge which would violate any of the standards in ECC 7.91.010 through 7.91.040; and
4. Procedures to prevent adverse impact from any accidental or slug discharge. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading

operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment for emergency response.

Any discharger is obligated to notify the WWTP immediately upon the occurrence of a slug load or "accidental discharge" of substances regulated by Chapters 7.90 through 7.102 ECC. The notification shall include location of discharge, date and time thereof, type of waste, concentration and volume, and corrective actions.

Within seven days following an accidental discharge, the user is obligated to submit a detailed written report describing the cause of the discharge and the measures to be taken by the user to prevent similar future occurrences.

The City has a reporting protocol that includes informing the Department of Ecology within the next business day of the event.

10.3.5 CMOM

The EPA has issued draft regulations implementing the Capacity, Management, Operations, and Maintenance (CMOM) program. CMOM requires the development of facility maintenance plans, tracking of asset condition, establishing level of service and performance goals. Key requirements are outlined below:

1. Capacity Assurance Plan
   - evaluate existing system;
   - identify capacity deficiencies;
   - establish short and long-term remedies to capacity deficiencies.

2. Management Program
   - specify program goals;
   - establish organizational structure
   - legal authority (e.g. service agreements) to manage flow;
   - establish program measures and ranking of O&M activities based on current capacity and structural deficiencies.
   - audit documentation of changes in system condition and performance
   - establish standards and requirements for new construction as well as rehabilitation and repair.

3. Overflow Response Plan (ORP)
   - steps to respond to SSO's and to implement response plan

4. Audit Operations and Maintenance performance
   - initial assessment of O&M activities;
   - establish performance goals, measures and priorities
   - perform periodic audits to identify progress and required revisions to the program.

The City Staff has utilized an asset tracking system called Granite. This system is a data management system that chronicles the condition of all known problem segments in the City. This data is included in Appendix F. This data was integrated into the CIP listings in this chapter.

10.3.6 Puget Sound Water Quality Management Plan

The Federal Water Pollution Control Act established the requirement for a Water Quality Management Plan. Resultantly, RCW 90.71 established the need of a Puget Sound Water Quality Management Plan. The stated objectives of this governance are to recover of the Puget Sound waters by the year 2020. This Comprehensive Sewer Plan is consistent with the intended goals of the Water Quality Management Plan.

10.4 MANAGEMENT SYSTEM / RECORD KEEPING

10.4.1 Collection System

The City maintains an ongoing record of existing and as-built sewer extensions. Previously these records were retained as AutoCAD files, though more recently, the City has developed GIS based drawings in an effort to have a more comprehensive and consolidated record of pipe age, size and material, invert and rim elevations, slopes and manhole identifiers. As the GIS mapping expands, the O&M activities should be incorporated into this data base.

These activities should include the last time the pipe segments were internally televised, flushed and jetted. It could also include incident reports, backup events and surcharging manholes.

10.4.2 National Pollution Discharge Elimination System (NPDES) Permit

The City's NPDES permit requires that record keeping be maintained and that regular reporting be made to DOE. Any spills in the City's collection system are reported as part of the NPDES Permit requirements. A copy of the City's current NPDES Permit is included in Appendix K.

10.5 PERFORMANCE INDICATORS

10.5.1 Wastewater Treatment Plant

The treatment plant operates under the current NPDES Permit No. WA-0024058. This permit requires regular reporting of influent loading and effluent mass and concentrations discharged through the existing marine outfall.

Performance of the plant is presented in Figures 8-1 through 8-4. From the period 2002 through 2012, the plant had no violations of the limits defined in the permits.

The NPDES permits also define the maximum allowable influent loadings and concentrations. None of the loading limitations were exceeded for the period 2002 through 2012.

In addition, the WWTP has other permits and regulations that affect operations, e.g. PSCAA permit that regulates the air emissions.

10.6 CONDITION ASSESSMENT

10.6.1 Collection System

The City staff has an ongoing routine of performing internal inspection of the City's lines. As described in section 10.2.1.2 the staff TVs approximately 230,000 linear feet of pipe each year. These records are retained and reviewed to judge the progression of the deterioration of those pipe segments.

The staff also maintains a frequent flush list. The frequency and any particular observances are tracked to specifically address these chronic problem areas.

10.6.2 Lift Stations

The City is currently undertaking an aggressive program of lift station rehabilitation. It is anticipated that this program will be concluded in 2013 – 2014. This work is included in Table 9.3.

10.7 SEWER DIVISION STAFFING NEEDS

The City employs a total of 7.5 FTE in the Sewer Division.

To compare the pipeline and lift station staffing with other wastewater purveyors, the report has looked at the Woodinville Water District, Southwest Suburban Sewer District and Alderwood Water and Wastewater District.

The summary below also presents the estimates as used by EPA in the *Estimating Costs and Manpower Requirements for Conventional Wastewater Treatment Facilities* and *Innovative and Alternative Technology Assessment Manual*.

Agency	Service Area, Ac	Lift Stations	Current Staff	Length Pipe, LF	Person/ 100,000 LF	Person/ 10,000 Ac
Woodinville WD	1,261	2	3	181,000	1.66	23.8

SWSSD	7,848	11	7	1,419,700	0.50	9.0
AWWD	24,498	14	10	1,942,900	0.50	4.1
City of Edmonds	5,700	14	7.5	680,000	0.90	13.2
EPA Estimate for Edmonds			12.3			

As expected, the personnel per acre values decrease as the size of the service area increases. However, using a very conservative application of the EPA guidelines, it would suggest that the City might be under staffed.

Prior to adding staff, it is recommended that the City revisit their previous staffing studies to determine if adding staff is warranted.

10.8 WWTP STAFFING

The WWTP is staffed 18 hours/day, 7 days/week. The City has a total WWTP Staff of 15 FTE.

The EPA *Estimating Costs and Manpower Requirements for Conventional Wastewater Treatment Facilities* suggests that a WWTP the size and complexity of the Edmonds plants could support 25 FTE. This publication is several years old and tended to overestimate the manpower requirement.

Chapter 11 – FINANCIAL PLAN

11.1 INTRODUCTION

The objective of the sewer system financial plan is first to identify the total cost of providing sewer service, and then to present a financial program that allows the sewer utility to remain financially viable during the execution of its 7-year Capital Improvement Program (CIP), as defined in Chapter XI of this document. This viability analysis considers the historical financial condition of the utility, the sufficiency of utility revenues to meet current and future financial and policy obligations, and the financial impact of executing the CIP.

11.2 PAST FINANCIAL PERFORMANCE

The City of Edmonds legally owns and operates a combined utility fund that includes water, sewer, and stormwater utilities. Therefore, standard financial statements are not readily available for the sewer utility alone. Financial information regarding each individual utility is available in the form of utility accounting reports at a sub-account level of detail. Using these reports and detailed utility financial data provided by City staff, we tried to construct a simple financial report mimicking income and cash flow statements.

Table 11.1 summarizes the sewer utility's historical revenues, operating expenses, and transfer and debt service payments.

Table 11.1: Historical Financial Performance (2008 – 2012)

	2008	2009	2010	2011	2012
REVENUES					
Sewer Sales	$ 4,971,286	$ 5,177,227	$ 5,128,274	$ 5,159,508	$ 5,204,471
Intergovernmental Services	1,742,983	1,795,899	1,737,886	1,809,936	2,002,393
Miscellaneous Revenues	234,292	173,053	142,737	186,609	131,085
Total Revenues	**$ 6,948,561**	**$ 7,146,179**	**$ 7,008,896**	**$ 7,156,053**	**$ 7,337,950**
OPERATING EXPENDITURES					
Salaries and Wages	$ 1,507,104	$ 1,562,851	$ 1,595,992	$ 1,600,811	$ 1,681,040
Benefits	575,530	594,919	607,642	622,789	642,743
Supplies	479,094	504,700	475,169	503,698	564,549
Services	1,405,722	1,283,597	1,601,954	1,739,772	1,651,293
Intergovernmental Services	234,162	214,280	236,574	194,661	88,441
City Utility Tax	280,997	469,835	465,215	468,078	445,414
Building, Machinery, & Equipment	5,823	-	-	6,012	-
Interfund Services & Rentals	601,761	522,981	466,899	477,276	539,922
Total Operating Expenditures	**$ 5,090,193**	**$ 5,153,163**	**$ 5,449,446**	**$ 5,613,097**	**$ 5,613,402**
OPERATING SURPLUS / (DEFICIT)	**$ 1,858,369**	**$ 1,993,016**	**$ 1,559,450**	**$ 1,542,956**	**$ 1,724,548**
Debt Service Interest	$ 92,616	$ 73,085	$ 66,281	$ 56,819	$ 54,698
SURPLUS / (DEFICIT) AFTER DEBT INTEREST	**$ 1,765,753**	**$ 1,919,931**	**$ 1,493,169**	**$ 1,486,137**	**$ 1,669,850**
Debt Service Principal	$ 656,838	$ 283,307	$ 314,886	$ 318,928	$ 300,796
Interfund Transfers Out for Capital	601,000	1,428,815	3,524,169	661,545	556,874
TOTAL CASH OUTLAY	**$ 6,440,647**	**$ 6,938,370**	**$ 9,354,782**	**$ 6,650,390**	**$ 6,525,770**
CASH SURPLUS / DEFICIT	**$ 507,915**	**$ 207,809**	**$ (2,345,886)**	**$ 505,663**	**$ 812,179**

Overall, the sewer utility's total revenues have been stable around $7.0 million in each of the last five years. Of that total, rate revenues have been stable around $5.2 million in last five years. Historically, the City's growth rate has been low, and the City did not adjust its sewer rates in the last five years. The City utility tax rate was increased from 6% to 10% at the beginning of 2009. As a result the utility's rate revenues increased from approximately $5.0 million in 2008 to $5.2 million in 2009.

The City maintains and operates a wastewater treatment plant that also serves neighboring jurisdictions through interlocal agreements. The City's major partnering jurisdictions are the City of Mountlake Terrace, Olympic View Water and Sewer District, and Ronald Sewer District. These jurisdictions share the cost of maintaining and operating the treatment plant proportional to their wastewater flow. Revenues from these agencies slightly increased from $1.7 million in 2010 to $2.0 million in 2012. This increase is the result of overall O&M cost increases (as can be seen from the total operating expenditures).

Total operating expenditures increased from $5.1 million in 2008 to $5.6 million in 2012. The most noticeable contributors to this increase were the growth in City utility taxes, services, and salaries and wages. As mentioned earlier, the increase in the utility tax expenditure was the result of a utility tax rate adjustment in 2009. Increases in the other two expense categories were mainly a result of, and in line with, inflationary trends.

Over the last five years, the utility posted operating surpluses ($1.7 million on average). These surpluses have been used to make debt service payments (principal and interest), and transferred to the capital construction fund for funding the utility's capital projects.

Generally speaking, the utility has not been burdened by its debt service obligations. The utility generated operating surpluses sufficient to cover its debt service payments.

Over the last five years, the City transferred approximately $6.8 million from the sewer operating fund to the sewer capital construction fund to pay for the utility's capital needs. On average, this amount corresponds to approximately $1.4 million a year. Transfers out for capital peaked in 2010 with an approximately $3.5 million transfer. In that year, the utility posted a cash deficit of $2.3 million and used its available cash balances to meet the deficiency. In the remainder of the analysis period (i.e., 2008, 2009,2011, and 2012), the utility generated cash surpluses after paying for its operating expenditures, servicing debt, and transferring monies for its capital needs.

In short, the utility has been financially healthy and self-sufficient in recent years. On the other hand, the utility needs to fund substantial capital investment to rehabilitate its aging infrastructure, as identified in this comprehensive plan. To finance these capital projects and maintain the financial strength of the utility, the City will need a series of rate increases. The analysis of the utility's capital funding needs and other financial requirements, and hence projected rate adjustments, are provided later in this chapter.

11.3 CAPITAL FUNDING RESOURCES

The City may fund the sewer CIP from a variety of sources. In general, these sources can be summarized as: 1) governmental grant and loan programs; 2) publicly issued debt (tax exempt or taxable); and 3) cash resources and revenues. These sources are described below.

11.3.1 Government Programs

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However due to budgetary constraints, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining miscellaneous grant programs are generally lightly funded and heavily subscribed. Nonetheless, the benefit of even low-interest loans makes the effort of applying worthwhile. The major funding sources are as follows:

Department of Ecology Grants and Loans.

The Department of Ecology (Ecology) Water Quality Program administers three major funding programs that provide low interest loans, grants, or loan and grant combinations for projects that protect, preserve and enhance water quality in Washington State. These loan and grant programs are primarily for wastewater projects. Each funding cycle begins in the fall when Ecology accepts project applications. Ecology rates and ranks applications based on the highest-priority needs. The amount of available grant and loan funding varies from year to year based on the state's biennial budget appropriation process and the

annual congressional federal budget. The three sources of funding for water quality projects are

- Centennial Clean Water Fund Grant Program,
- Federal Clean Water Act Section 319 Nonpoint-Source Grant Program, and
- Washington State Water Pollution Control Revolving Fund Loan Program.

Public Works Trust Fund (PWTF) Loans. Cities, towns, counties and special purpose districts are eligible to receive loans. Water, sewer, storm, roads, bridges and solid waste/recycling are eligible and funds may be used for repair, replacement, rehabilitation, reconstruction and improvements including reasonable growth (generally the 20-year growth projection in the comprehensive plan).

In 2011, the PWTF Board made some significant changes in its loan programs. Jurisdictions are no longer required to contribute a local match towards project costs. The standard loan offer is 1% interest repaid over a 20-year term. Applicants may request alternative loan terms. Shorter repayments terms qualify for a lower interest rate (0.5% for 10-year term, and 0.75% for 15-year term), while longer repayment terms require a higher interest rate (1.5% for 25-year term, and 2% for 30-yearterm). Applicants may qualify for additional interest rate reductions based on financial distress. All loan terms are subject to negotiation and Public Works Board approval.

The Public Works Assistance Account did not receive a 2013-15 biennial appropriation. As part of the biennial budget prioritization process, the funding in the Public Works Assistance Account was diverted to the General fund to help pay for competing state priorities.

11.3.2 Public Debt

General Obligation Bonds. General obligation (G.O.) bonds are bonds secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low interest rates and few financial restrictions. However, the authority to issue councilmanic G.O. bonds is restricted in terms of the amount and use of the funds, as defined by the Washington State constitution and statute. Specifically, the amount of debt that can be issued without a public vote is linked to assessed valuation.

RCW 39.36.020 states:

> *"(ii) Counties, cities, and towns are limited to an indebtedness amount not exceeding one and one-half percent of the value of the taxable property in such counties, cities, or towns without the assent of three-fifths of the voters therein voting at an election held for that purpose.*
>
> *(b) In cases requiring such assent counties, cities, towns, and public hospital districts are limited to a total indebtedness of two and one-half percent of the value of the taxable property therein."*

While bonding capacity can limit the availability of councilmanic G.O. bonds for utility

purposes, these can sometimes play a valuable role in project financing. A rate savings may be realized through two avenues: the lower interest rate and related bond costs; and the extension of the repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an ad valorem property tax levy.

Revenue Bonds. Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the rate revenues of the issuing utility and the debt obligation does not extend to the City's other revenue sources. With this limited commitment, revenue bonds typically bear higher interest rates than G.O. bonds and also require security conditions related to the maintenance of dedicated reserves (a bond reserve) and financial performance (added bond debt service coverage). The City agrees to satisfy these requirements by ordinance as a condition of bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no bonding limit, except perhaps the practical limit of the utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing bonds problematic.

11.3.3 Cash Resources

Capital Facilities Charges. A capital facilities charge (CFC) as provided for by RCW 35.92.025, refers to a one-time charge imposed on new customers as a condition of connection to the utility system. The purpose of the CFC is two-fold: (1) to promote equity between new and existing customers; and (2) to provide a source of revenue to fund capital projects. Equity is served by providing a vehicle for new customers to share in the capital costs incurred to support their addition to the system. CFC revenues provide a source of cash flow used to support utility capital needs; revenue can only be used to fund utility capital projects or to pay debt service incurred to finance those projects.

In the absence of a CFC, growth-related capital costs must be borne in large part by existing customers. In addition, the net investment in the utility already collected from existing customers, whether through rates, charges and/or assessments, would be diluted by the addition of new customers, effectively subsidizing new customers with prior customers' payments. To establish equity, a CFC should recover a proportionate share of the existing and future infrastructure costs from a new customer. From a financial perspective, a new customer should become financially equivalent to an existing customer by paying the CFC.

The City updated its capital facilities charges at the end of 2011, and adopted a three-year phase-in strategy to implement its new capital facilities charges. The City is currently in the second year of its three-year phase-in period. The City currently imposes a charge of $3,495.25 per equivalent dwelling unit (EDU) for its sewer utility. The charge is expected to increase to $4,417 per ERU at the beginning of 2014.

Utility Funds and Cash Reserves. User charges (rates) paid by the utility's customers are the main funding source for all sewer utility activities. The rates cover total annual costs associated with operation and maintenance of the sewer system, and other ongoing costs of providing sewer service. Rates can pay for capital improvement projects in two

ways: either paying for debt service or directly paying for capital projects. Although funding capital costs directly through rates does not result in additional interest expense associated with issuing debt, this approach can cause large and/or volatile rate increases.

11.3.4 Summary

An ideal funding strategy would include the use of grants and low-cost loans when debt issuance is required. However, these resources are very limited and competitive in nature and do not provide a reliable source of funding for planning purposes. It is recommended that the City pursue these funding avenues but assume for planning purposes that bond financing will be utilized to meet needs above the utility's available cash resources. G.O. bonds may be useful for special circumstances, but due to the bonding capacity limits, this vehicle is most often reserved for other City (non-utility) purposes. Revenue bonds are a more secure financing mechanism for utility needs. The Capital Financing Strategy developed to fund the updated CIP assumes the following funding priority:

1. Available grant funds,
2. Accumulated capital cash reserves,
3. Annual use of excess cash (above minimum balance targets) from operating reserves,
4. Capital reserves and other miscellaneous capital resources, including government program loans to the extent that they are accessible,
5. Revenue bond financing, and
6. Direct rate funding.

11.4 FINANCIAL PLAN

The City of Edmonds' sewer utility operates as an enterprise fund and as such it is responsible for funding all of its related costs. It is not dependent on general tax revenues or general fund resources. The primary sources of funding for the utility are retail and wholesale sewer service charges. The City controls the level of service charges by ordinance, and subject to statutory authority, can adjust user charges as needed to meet financial objectives.

The financial plan can only provide a qualified assurance of financial feasibility if it considers the total system costs of providing sewer service – both operating and capital. To meet these objectives, the following elements are completed:

- **Capital Funding Plan** – This plan identifies total CIP obligations for the planning period 2013 – 2019. The plan defines a strategy for funding the CIP, including an analysis of available resources from rate revenues, existing reserves, capital facilities charges, debt financing and any special resources that may be readily available (e.g. grants, developer contributions, etc). The capital funding plan impacts the financial plan through the use of debt financing (resulting in annual debt service) and the assumed rate revenue resources available for capital funding.

- **Financial Plan** – This forecast identifies annual non-capital costs associated with the operation, maintenance, and administration of the sewer system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity along with testing for satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, debt service, and reserve contributions, as well as any coverage requirements associated with long-term debt.

11.4.1 Financial Policies

A brief summary of the key financial policy assumptions used in the financial analysis, as well as those recommended in the financial program are discussed below:

Reserve Policies. Utility reserves serve multiple functions. They can be used to address the variability and timing of expenditures and receipts; occasional disruptions in activities, costs or revenues; utility debt obligations; and many other functions. The collective use of individual reserves helps to limit the City's exposure to revenue shortfalls and meet long-term capital obligations. Common reserves among municipal utilities are operating reserves, capital contingency reserves, and bond reserves.

- **Operating Reserve** – An operating reserve, or working capital reserve, provides a minimum unrestricted fund balance needed to accommodate the short-term cycles of revenues and expenses. These reserves are intended to address both anticipated and unanticipated changes in revenues and expenses. Anticipated changes may include billing and receipt cycles, payroll cycles, and other payables. Operating reserves can be used to meet short-term cash deficiencies due to the timing of actual revenues and expenditures.

  Generally, utilities target a certain number of days of working capital as a beginning cash balance to provide the liquidity needed to allow regular management of payables and payment cycles. Consistent with industry practice, a working capital reserve of between 45 to 60 days of operating and maintenance (O&M) expenses are targeted in this analysis. Based upon the City's 2013 sewer budget, the target range is equivalent to between $700,000 and $935,000.

- **Capital Contingency Reserve** – A capital contingency reserve is an amount of cash set aside in case of an emergency should a piece of equipment or a portion of the utility's infrastructure fail unexpectedly. Additionally, the reserve could be used for other unanticipated capital needs including capital project cost overruns. There are various approaches to identifying an appropriate level for this reserve, such as (1) identifying a percentage of utility system fixed asset costs and, (2) determining the cost of replacing highly critical assets or facilities. As an industry standard, the target capital contingency reserve is typically set at 1-2% of original asset value or average annual CIP spending. For purposes of this analysis, no minimum target fund balance is set, per City staff's direction, to reduce the utility's rate adjustment needs.

- **Bond Reserve** – Bond covenants often establish reserve requirements as a means of protecting an agency against the risk of nonpayment. The bond reserve can be funded with cash on hand, but is more often funded at the time of borrowing as part of the bond principal. This reserve requirement can also be met by using a surety bond. The City maintains a restricted bond reserve in compliance with its bond covenants.

System Reinvestment Policies. The purpose of system reinvestment funding is to provide for the replacement of aging system facilities to ensure sustainability of the system for ongoing operation. Each year, the utility's assets lose value, and as they lose value they are moving toward eventual replacement. That accumulating loss in value and future liability is typically measured for reporting purposes through annual depreciation expense, which is based on the original cost of the asset over its anticipated useful life. While this expense reflects the consumption of the existing asset and its original investment, the replacement of that asset will likely cost much more, factoring in inflation and construction conditions. Therefore, the added annual replacement liability is even greater than the annual depreciation expense.

On the spectrum of policy options related to system reinvestment funding, basing a system reinvestment policy on the projected replacement cost of assets would result in the largest immediate rate impact and the lowest future debt obligation. A policy based on annual depreciation expense has the next greatest immediate rate impact. This policy does not target a replacement reserve level sufficient to cash fund 100% of future replacement costs and therefore assumes some replacement costs will be debt-financed.

One approach aimed at mitigating the accumulating asset replacement liability, as well as current rate impacts, is to fund an amount from rates equal to annual depreciation expense, net of annual debt principal repayment. Annual debt principal payments are one source of annual equity contribution to the system. Using annual depreciation expense as the measure of annual equity loss, and as a basis for a system reinvestment policy, it is appropriate then, to reduce the annual depreciation expense by the annual equity contribution, as measured by debt principal repayment. This approach tends to balance reducing near-term rate impacts with mitigating accumulating asset replacement liability.

The analysis provided herein does not incorporate any system reinvestment funding, per City staff's direction, to reduce immediate rate impacts.

Debt Policies. Bond covenants often establish a minimum debt coverage ratio as a means of protecting an agency against the risk of nonpayment. Typically, the revenue bond coverage requirement is expressed as a multiple of the annual debt service payment, and ranges between 1.25 and 2.00 (the higher the perceived creditworthiness of borrower, lower the bond coverage requirement). A 1.25 coverage requirement means that annual rate revenue must be set sufficient to support annual operating expenses, annual revenue bond debt repayment, and a cushion of 25% of the annual revenue bond debt repayment. For the purposes of this analysis, it is assumed that the sewer utility will meet a 1.25 revenue bond coverage ratio independently, without relying on the City's water and stormwater utilities' financial performance.

11.4.2 Capital Funding Plan

The City of Edmonds' share of the CIP developed for this plan totals $26.5 million ($28.4 million inflated) over the 2013-2019 planning horizon. Costs are escalated to the year of planned spending for financing projections at an annual inflation rate of 3%.

The CIP consists of three components; wastewater treatment plant projects, collection system projects, and projects driven by the operating needs and/or to improve operating efficiency. Partnering jurisdictions (i.e. City of Edmonds, City of Mountlake Terrace, Olympic View Water and Sewer District, and Ronald Sewer District) share the cost of wastewater treatment plant projects based on each jurisdiction's capacity share in the treatment plan in accordance with the interlocal agreement dated May 17, 1988. The City of Edmonds' share is 50.787%.

Table 11.2 summarizes annual CIP expenditures in 2013 and inflated costs.

Table 11.2: Capital Improvement Program (2013 – 2019)

	2013	2014	2015	2016	2017	2018	2019	TOTAL
In 2013 Dollars								
WWTP Projects - Total	$ 1,910,704	$ 981,000	$ 1,000,000	$ 1,005,000	$ 975,000	$ 930,000	$ 975,000	**$ 7,776,704**
WWTP Projects - City of Edmonds' Share	$ 970,389	$ 498,220	$ 507,870	$ 510,409	$ 495,173	$ 472,319	$ 495,173	**$ 3,949,555**
Collection System Projects	5,842,110	3,338,350	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	**19,180,460**
Maintenance Related Projects	743,000	597,000	754,000	440,000	425,000	425,000	-	**3,384,000**
TOTAL CIP for the CITY OF EDMONDS	**$ 7,555,499**	**$ 4,433,570**	**$ 3,261,870**	**$ 2,950,409**	**$ 2,920,173**	**$ 2,897,319**	**$ 2,495,173**	**$ 26,514,014**
Inflated Dollars								
WWTP Projects - Total	$ 1,910,704	$ 1,010,430	$ 1,060,900	$ 1,098,191	$ 1,097,371	$ 1,078,125	$ 1,164,201	**$ 8,419,922**
WWTP Projects - City of Edmonds' Share	$ 970,389	$ 513,167	$ 538,799	$ 557,738	$ 557,322	$ 547,547	$ 591,263	**$ 4,276,226**
Collection System Projects	5,842,110	3,438,500	2,121,800	2,185,454	2,251,018	2,318,548	2,388,105	**20,545,534**
Maintenance Related Projects	743,000	614,910	799,919	480,800	478,341	492,691	-	**3,609,661**
TOTAL CIP for the CITY OF EDMONDS	**$ 7,555,499**	**$ 4,566,577**	**$ 3,460,518**	**$ 3,223,992**	**$ 3,286,681**	**$ 3,358,787**	**$ 2,979,367**	**$ 28,431,421**

The capital funding plan determines the total resources available to meet CIP costs and further evaluates if new debt financing will be required. The City is assumed to entirely fund its share using sewer utility sources (either by cash financing or debt issues). The 2013 beginning balance of the sewer utility fund was $7,603,137. Of this amount, $1,250,000 is assumed to be reserved as working capital based on the set operating fund target balances, and the remainder ($6,353,137) is assumed to be available for capital. The capital funding plan is summarized in Table 11-3 below.

Table 11.3: Annual Capital Fund Cash Flow (2013 – 2019)

	2013	2014	2015	2016	2017	2018	2019
Beginning Balance	$ 6,353,137	$ 7,816,336	$ 3,512,765	$ 490,166	$ 3,358,237	$ 407,884	$ 3,064,195
plus: Grants / Donations / Outside Sources	47,000	-	-	-	-	-	-
plus: Capital Facilities Charges	10,000	10,000	10,000	10,000	10,000	10,000	10,000
plus: Net Debt Proceeds Available for Projects	8,300,000	-	-	6,000,000	-	6,000,000	-
plus: Interest Earnings	15,883	19,541	17,564	3,676	33,582	5,099	45,963
plus: Transfer of Surplus from Operating Fund	645,816	233,466	410,354	78,387	292,745	-	227,991
less: Capital Expenditures	(7,555,499)	(4,566,577)	(3,460,518)	(3,223,992)	(3,286,681)	(3,358,787)	(2,979,367)
Ending Balance	**$ 7,816,336**	**$ 3,512,765**	**$ 490,166**	**$ 3,358,237**	**$ 407,884**	**$ 3,064,195**	**$ 368,782**

The costs shown in the table are inflated to the year of spending. A majority (71.4%) of the 7-year CIP is projected to be financed with new debt issues. The remaining 28.6% of the 7-year CIP is financed from utility resources such as existing cash balances, rates, capital facility charge revenues, and capital fund interest earnings. The capital funding strategy anticipates three bond issues, one in 2013 in the amount of $8.3 million (the City is already in the process of issuing), and the other two in 2016 and 2018 both in the amount of $6.0 million.

11.4.3 Financial Forecast

The Financial Forecast, or revenue requirement analysis, projects the amount of annual rate revenue needed to meet the utility's financial obligations. The analysis incorporates operating revenues, operating and maintenance (O&M) expenses, debt service payments, rate funded capital needs, and any other identified revenues or expenses related to utility operations, and determines the sufficiency of the current level of rates. Revenue needs are also impacted by debt covenants (typically applicable to revenue bonds) and specific fiscal policies and financial goals of the utility (as described above).

For this analysis, two revenue sufficiency criteria have been developed to reflect the financial goals and constraints of the utility: (1) cash needs must be met and (2) debt coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

Cash Test. The cash flow test identifies all known cash requirements for the utility in each year of the planning period. Capital needs are identified and a capital funding strategy is established. This may include the use of debt, cash reserves, outside assistance, and rate funding. Cash requirements to be funded from rates are determined. Typically, these include O&M expenses, debt service payments, system reinvestment funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the utility are then compared to total operating revenues (under current rates) to forecast annual revenue surpluses or shortfalls.

Coverage Test. The coverage test is based on a commitment made by the City when issuing revenue bonds. For purposes of this analysis, revenue bond debt is assumed for any needed debt issuance. As a security condition of issuance, the City is required per covenant to agree that the revenue bond debt would have a higher priority for payment (a senior lien) than most other utility expenditures; the only outlays with a higher lien are O&M expenses. Debt service coverage is expressed as a multiplier of the annual revenue bond debt service payment. For example, a 1.0 coverage factor would imply no additional cushion is required. A 1.25 coverage factor means revenues must be sufficient to pay O&M expenses, annual revenue bond debt service payments, plus an additional 25% of annual revenue bond debt service payments. The excess cash flow derived from the added coverage, if any, can be used for any utility purpose, including funding capital projects. The existing coverage requirement on the City's outstanding revenue bonds is 1.25 times bond debt.

In determining the annual revenue requirement, both cash and coverage sufficiency tests must be met – the test with the greatest deficiency drives the level of needed rate increase

in any given year. The analysis uses this rate revenue requirement to indicate annual rate adjustments.

11.4.4 Projected Financial Performance

The revenue requirement analysis is based on the following data, assumptions, and adjustments:

- The 2013 budget is used as the basis of the analysis.
- Rate revenues under existing rates are calculated to increase with customer growth. Customer growth assumptions are provided by City staff, and projected to be approximately 0.5% per year.
- Labor costs (i.e. salaries and wages) are escalated annually at 3%.
- Benefits costs are escalated annually at 10%.
- Other operating and maintenance expenses are escalated annually at 3%.
- The City's annual fund interest earnings rate is assumed to be 0.25 in 2013 and 2014. From this level, it is assumed to increase by 25 basis points (i.e. 0.25%) each year, reaching 1.5% in 2019.
- Inflated capital expenses reflect annual construction cost inflation of 3% starting in 2014.
- In addition to maintenance and operating costs, revenue requirements include capital costs for new debt service incurred to fund the CIP.
- The City is currently in the process of issuing a revenue bond in 2013 to fund the capital needs of its three utilities (i.e. sewer, water, and stormwater) through 2015. The analysis presented herein is based on the draft borrowing terms and repayment schedule for the anticipated 2013 issue as provided by City's bond advisor.
- The forecast assumes a revenue bond interest rate of 5%, a repayment term of 20 years, and required coverage of 1.25 times debt service for the proposed subsequent bond issues.
- The 2013 beginning balance of the sewer utility fund was $7,603,137. Of this amount, $1,250,000 is assumed to be reserved as working capital based on the set operating fund target balances, and the remainder is assumed to be transferred to the capital fund.

Table 11.4 summarizes the projected financial performance and rate revenue requirements of the sewer utility for 2013 through 2019 based upon the above assumptions.

Table 11.4: Summary of Revenue Requirements (2013 – 2019)

Revenue Requirements	2013	2014	2015	2016	2017	2018	2019
Revenues							
Rate Revenues Under Existing Rates **[a]**	$ 4,935,000	$ 4,959,675	$ 4,984,473	$ 5,009,396	$ 5,034,443	$ 5,059,615	$ 5,084,913
Non-Rate Revenues	69,030	69,670	73,953	78,432	88,356	94,579	108,748
Total Revenues	**$ 5,004,030**	**$ 5,029,345**	**$ 5,058,427**	**$ 5,087,828**	**$ 5,122,798**	**$ 5,154,194**	**$ 5,193,661**
Expenses							
411 Sewer Cash O&M Expenses **[b]**	$ 2,193,939	$ 2,279,110	$ 2,368,721	$ 2,462,948	$ 2,562,107	$ 2,666,539	$ 2,776,614
411 Treatment O&M - Edmonds Only	1,888,449	1,962,640	2,040,811	2,123,256	2,210,296	2,302,282	2,399,595
Transfer to Fund 414 (excl. Capital)	130,201	130,500	130,807	130,785	130,098	129,695	129,979
Existing Debt Service	352,792	193,771	193,561	192,803	192,476	192,138	191,252
New Debt Service	111,637	493,478	494,508	1,018,941	1,016,994	1,543,258	1,541,999
Total Expenses	**$ 4,677,018**	**$ 5,059,498**	**$ 5,228,408**	**$ 5,928,732**	**$ 6,111,972**	**$ 6,833,913**	**$ 7,039,439**
Annual Rate Adjustment	**0.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**
Rate Revenues After Rate Increase **[a]**	$ 4,935,000	$ 5,257,256	$ 5,600,554	$ 5,966,270	$ 6,355,868	$ 6,770,906	$ 7,213,046
Net Cash Flow After Rate Increase	327,012	267,427	446,100	115,971	332,252	31,572	282,355
Coverage After Rate Increases	8.04	5.34	5.77	3.26	3.57	2.59	2.83

[a] Net of City utility taxes and intergovernmental payments from partners for wastewater treatment services.
[b] Net of City utility taxes; includes additional state taxes due to proposed rate increases.

As shown in the table, revenues under the existing rates are not sufficient to fund projected rate needs. The projected revenue deficiency is primarily due to new debt repayment obligations and funding of the proposed capital improvement program.

It is projected that the City will need to increase its sewer rates by 6% annually in 2014 through 2019. The analysis assumes that the rate adjustments would be implemented at the beginning of each year, and the new rates will be in effect for the entire year.

Table 11.5 below demonstrates the projected cash balances (operating, capital, and debt reserve funds) for the sewer utility, assuming that the rate increases proposed in Table 11.4 above are implemented.

Table 11.5: Projected Cash Balances (2013 – 2019)

Fund Balances	2013	2014	2015	2016	2017	2018	2019
Operating Fund	$ 931,197	$ 965,158	$ 1,000,904	$ 1,038,488	$ 1,077,995	$ 1,109,567	$ 1,163,931
Capital Fund	7,816,336	3,512,765	490,166	3,358,237	407,884	3,064,195	368,782
Debt Reserve Fund	629,455	629,455	629,455	1,152,914	1,152,914	1,676,374	1,676,374
Total	**$ 9,376,988**	**$ 5,107,378**	**$ 2,120,524**	**$ 5,549,639**	**$ 2,638,793**	**$ 5,850,136**	**$ 3,209,086**
Combined Minimum Target Balance	*$ 961,374*	*$ 1,315,763*	*$ 1,343,602*	*$ 1,896,223*	*$ 1,923,907*	*$ 2,481,474*	*$ 2,513,363*

The City is considering implementing higher rate adjustments to reduce its reliance on debt financing and start cash financing the utility's approximately $2.0 million a year repair and replacement needs by 2019. If the City were to implement this policy decision, the needed annual rate adjustments would be 9.5% in 2014 through 2019. The projected financial performance of the sewer utility under this scenario is summarized in Table 11.6.

Table 11.6: Summary of Revenue Requirements (2013 – 2019) – Alternative Scenario

Revenue Requirements	2013	2014	2015	2016	2017	2018	2019
Revenues							
Rate Revenues Under Existing Rates **[a]**	$ 4,935,000	$ 4,959,675	$ 4,984,473	$ 5,009,396	$ 5,034,443	$ 5,059,615	$ 5,084,913
Non-Rate Revenues	69,030	69,670	73,953	78,432	87,221	93,161	101,964
Total Revenues	**$ 5,004,030**	**$ 5,029,345**	**$ 5,058,427**	**$ 5,087,828**	**$ 5,121,664**	**$ 5,152,776**	**$ 5,186,877**
Expenses							
411 Sewer Cash O&M Expenses **[b]**	$ 2,193,939	$ 2,285,797	$ 2,383,203	$ 2,486,473	$ 2,596,080	$ 2,712,537	$ 2,836,408
411 Treatment O&M - Edmonds Only	1,888,449	1,962,640	2,040,811	2,123,256	2,210,296	2,302,282	2,399,595
Transfer to Fund 414 (excl. Capital)	130,201	130,500	130,807	130,785	130,098	129,695	129,979
Existing Debt Service	352,792	193,771	193,561	192,803	192,476	192,138	191,252
New Debt Service	111,637	493,478	494,508	905,524	903,578	1,080,869	1,079,610
Rate Funded CIP	-	-	-	-	-	57,506	1,411,664
Total Expenses	**$ 4,677,018**	**$ 5,066,185**	**$ 5,242,889**	**$ 5,838,841**	**$ 6,032,528**	**$ 6,475,028**	**$ 8,048,508**
Annual Rate Adjustment	**0.00%**	**9.50%**	**9.50%**	**9.50%**	**9.50%**	**9.50%**	**9.50%**
Rate Revenues After Rate Increase **[a]**	$ 4,935,000	$ 5,430,844	$ 5,976,508	$ 6,576,998	$ 7,237,822	$ 7,965,042	$ 8,765,329
Net Cash Flow After Rate Increase	327,012	434,329	807,572	816,589	1,292,515	1,583,175	818,786
Coverage After Rate Increases	8.04	5.63	6.40	4.23	4.83	4.61	5.22

[a] Net of City utility taxes and intergovernmental payments from partners for wastewater treatment services.
[b] Net of City utility taxes; includes additional state taxes due to proposed rate increases.

Table 11.7 below demonstrates the projected cash balances (operating, capital, and debt reserve funds) for the sewer utility under this scenario, again assuming that the rate increases shown in Table 11.6 above are implemented.

Table 11.7: Projected Cash Balances (2013 – 2019) – Alternative Scenario

Fund Balances	2013	2014	2015	2016	2017	2018	2019
Operating Fund	$ 931,197	$ 965,158	$ 1,000,904	$ 1,038,488	$ 1,077,995	$ 1,119,732	$ 1,163,931
Capital Fund	7,816,336	3,679,667	1,019,374	3,292,033	1,301,280	1,567,703	808,103
Debt Reserve Fund	629,455	629,455	629,455	1,039,498	1,039,498	1,213,985	1,213,985
Total	**$ 9,376,988**	**$ 5,274,280**	**$ 2,649,733**	**$ 5,370,019**	**$ 3,418,773**	**$ 3,901,420**	**$ 3,186,018**
Combined Minimum Target Balance	*$ 961,374*	*$ 1,315,763*	*$ 1,343,602*	*$ 1,782,807*	*$ 1,810,491*	*$ 2,019,085*	*$ 2,050,974*

If the City is able to obtain available low cost loan and/or grant alternatives to fund its capital needs, required rate increases would be less than the projected rate increases presented above.

It is important to note that these projections are based upon current assumptions and the capital program identified herein. Circumstances might change over time, causing actual rate adjustments to be higher or lower once actual costs are known. It is imperative that the City track its costs as they become available and compare them to assumptions used in the study. If significant changes occur, the City should revisit the analysis and make appropriate changes.

11.5 CURRENT AND PROJECTED RATES

The City charges its residential sewer customers a flat bi-monthly (in some cases,

monthly) rate on a "per dwelling unit" basis. All other customers are charged a bi-monthly base charge and a uniform volume charge. The volume charge is applied on a per hundred cubic feet (ccf) of water consumption basis. The City's current (2013) sewer rates are as follows:

Table 11.8: Existing Sewer Rates

Customer class / Rate category	Bi-monthly Rates
Single-family residences	
Connected	$ 50.64
Unconnected	8.16
Duplexes and multi-unit residences	
Connected (per unit)	$ 40.69
Unconnected (per unit)	8.16
All other customers	
Fixed rate (per account)	$ 5.76
Volume rate (per ccf)	3.26

Table 11.9 presents the City's projected sewer rates incorporating the rate adjustments shown in the financial forecasts under the baseline implementation scenario.

Table 11.9: Projected Sewer Rates (2014 – 2019)

Customer class / Rate category	2014	2015	2016	2017	2018	2019
Projected Rate Increases	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**
Single-family residences						
Connected	$ 53.68	$ 56.90	$ 60.31	$ 63.93	$ 67.77	$ 71.83
Unconnected	8.65	9.17	9.72	10.30	10.92	11.58
Duplexes and multi-unit residences						
Connected (per unit)	$ 43.13	$ 45.72	$ 48.46	$ 51.37	$ 54.45	$ 57.72
Unconnected (per unit)	8.65	9.17	9.72	10.30	10.92	11.58
All other customers						
Fixed rate (per account)	$ 6.11	$ 6.47	$ 6.86	$ 7.27	$ 7.71	$ 8.17
Volume rate (per ccf)	3.46	3.66	3.88	4.12	4.36	4.62

Table 11.10 presents the City's projected sewer rates incorporating the rate adjustments shown in the financial forecasts under the alternative scenario.

Table 11.10: Projected Sewer Rates (2014 – 2019) – Alternative Scenario

Customer class / Rate category	2014	2015	2016	2017	2018	2019
Projected Rate Increases	**9.50%**	**9.50%**	**9.50%**	**9.50%**	**9.50%**	**9.50%**
Single-family residences						
Connected	$ 55.45	$ 60.72	$ 66.49	$ 72.80	$ 79.72	$ 87.29
Unconnected	8.94	9.78	10.71	11.73	12.85	14.07
Duplexes and multi-unit residences						
Connected (per unit)	$ 44.56	$ 48.79	$ 53.42	$ 58.50	$ 64.06	$ 70.14
Unconnected (per unit)	8.94	9.78	10.71	11.73	12.85	14.07
All other customers						
Fixed rate (per account)	$ 6.31	$ 6.91	$ 7.56	$ 8.28	$ 9.07	$ 9.93
Volume rate (per ccf)	3.57	3.91	4.28	4.69	5.13	5.62

11.6 CONCLUSION

Starting in 2014, the City's current rates are projected to be insufficient to fully fund the forecasted financial obligations of the utility. New financial obligations for which the utility will require additional rate revenues are mostly driven by the capital financing impacts (i.e. debt service payments for the new bond issues) of the proposed $26.5 million total CIP (2013 dollars; $28.4 million inflated dollars).

To generate adequate working capital to fund utility obligations and meet annual cash flow and debt service coverage requirements, a series of rate increases will be needed in years 2014 through 2019.

APPENDIX A

I&I Study

City of Edmonds

Inflow / Infiltration Study

June 2010

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City of Edmonds

INFLOW / INFILTRATION STUDY

June 2010

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City of Edmonds
Inflow and Infiltration Study

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III.	Rainfall and Flow Data Reduction	9
IV.	Presentation of Historical Data	10
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APPENDICES

A. Flow Data for August 2008, April 2008, December 2006 and December 2007 for the following Meters:
   a. Meter 1
   b. Meter 2
   c. Meter 3
   d. Meter A
   e. Meter B
   f. Meter C
   g. Meter D
   h. Meter E
   i. Edmonds - WWTP Meter
   j. MLT – WWTP Meter
   k. Pump Station No. 1

B. Proposed Standards, Policies and Guidelines

Standards

a. S-1 Storm Drainage Connections to the Sanitary Sewer System
b. S-2 Connections to Existing Sewer System
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d. S-4 Visual Inspection of Manholes for SSES Investigations
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h. P-8 Infeasible or Prohibitively Expensive Modifications
i. P-9 Contractor Qualifications

j. P-10 Required Permits
k. P-11 Inspection and Testing
l. P-12 Property Restoration
m. P-13 Contractor Bonding, Licensing and Warranty
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Guidelines
a. G-1 Modeling and Engineering Analysis
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f. G-6 Spot Repairs (Side Sewers)
g. G-7 Manhole Lids/Inserts

I. Introduction

In recent years during significant storm events, flows at the City's wastewater treatment plant were recorded at levels previously not experienced. These peak flows reportedly created surcharged conditions, though the surcharging hasn't resulted in reported overflows.

Historically, peak flows in the City's sanitary sewer system have been recorded as progressively increasing in response to wet weather events. These trends exceed the expected flows resulting from new connections.

In an effort to be proactive, the City wants to identify and correct the most egregious sources of Inflow and Infiltration (I/I). It is understood that this focus will require an on-going effort that may well extend beyond a single year's activities.

Though the goal is to find and fix the most severe problems, it is likely that some of the identified sources will have a secondary element that will prohibit the separation of the I/I. For instance, those sources that will result in significant environmental and/or permitting issues will be identified and logged but will not be slated for immediate correction. Similarly, those circumstances that include the disconnection of downspouts and that result in saturation of hillsides, the potential creation of unsafe stability issues and downstream flooding will similarly be placed in abeyance.

Throughout the creation of this report, both BHC and City staff have worked jointly together to assemble, refine and analyze the existing rainfall and flow data. Similarly, this report sought to estimate the volume of I/I within selected drainage basins, present a proposed solution for I/I separation and estimate the associated costs of I/I separation. This report also developed City Standards, Procedures, Policies and Guidelines that provide direct benefit in the long-term reduction of I/I into the City collection system. And lastly, this report also includes the identification and assessment of egregious pipe conditions found in the City collection systems due to root intrusion or other City identified conditions.

During this I/I assessment phase, the report also prioritizes and selects I/I reduction projects from the project areas. In doing so the report prepares a Capital Improvement Plan for I/I rehabilitation and root intrusion impacted collection systems.

BHC Consultants, as the Prime Consultant and Program Manager, lead and coordinated the work performed.

Based on historical flow data, peaking factors at the Wastewater Treatment Plant (WWTP) have been in the order of 4.0 for a typical spring storm to as high as 7.6

for the December 2006 storm event.. Peaking factors are defined as the peak hourly flows divided by the average annual flows. These values, when compared to other western Washington WWTP are not particularly out of line. This does not suggest that the peaks experienced at the plant are inconsequential and should be ignored. These high flow events have twice nearly resulted in bypassing the biological treatment portion of the plant, which most certainly would have occurred had there not been a mechanical failure in one of the upstream pump stations. However, flows to the WWTP are complicated by the flow swapping agreement that Edmonds has with King County. This flow swapping, in some ways, masks the severity of the I/I problems. This, coupled with a troubling trend that suggests that the peaking factors are continuing to increase, has caused the City to analyze, identify and correct I/I sources now before the hydraulic capacity of the plant is exceeded. By initiating a proactive program of identifying and removing I/I the City may be able to postpone or eliminate costly hydraulic expansions of the WWTP. Furthermore, the City's new NPDES permit requires an annual report that summarizes I/I removal measures that have been taken.

In an effort to identify the suspected worst basins, two standard comparative measurements were used to judge the severity of I/I within the catchment basins and also allow comparison with other agencies that have completed independent I/I studies previously. These measurements are:

- Gallons I/I per acre per day
- Gallons I/I per inch-diameter-mile per day

Based on City-provided data for the length and sizes of sewer mains within each catchment area, similar data from the tributary areas from the City of Mountlake Terrace and Ronald Sewer District, this analysis will be able to identify the most likely basins with the most severe I/I.

II. Basin Delineation

From the 2006 Comprehensive Sewer Plan and basin boundary information provided by the City staff, the drainage basins which are tributary to the City's WWTP were identified. These basins were confirmed with the O&M staff to verify that the basins are correctly represented.

Using existing data for parcels, streets and public right-of-ways, and City sewer mapping and manhole information a base map was created identifying the catchment areas for each basin.

The delineation of the basins is defined by two determining conditions or criteria, 1) area directly tributary to permanent flow meters that are in place and 2) area directly tributary to pump stations. The pump stations are not equipped with flow

meters and the determination of flows was derived from the pump run records and a verification of the pumping capacity.

Flow data from the following flow meters and pump stations were used in this analysis:

- Meter A
- Meter B
- Meter C
- Meter D
- Meter E
- Meter 1
- Meter 2
- Meter 3
- Pump Station No. 1
- WWTP Flow Meter - MLT
- WWTP Flow Meter - Edmonds

The direct use of this flow data (or in some cases the subtraction of flow data between adjacent flow meters) provided the basis for defining flows from discrete basins which are schematically represented in Figure 1 and graphically presented in Figure 2.

With the basins delineated an inventory of the existing piping systems was developed. Table 1 includes an individual basin breakdown of the catchment acreage, estimated length of main line sewer, the average diameter of those pipes and the inch - diameter - mile of pipe in each catchment area. This baseline data forms the foundation for determining the metric of comparison between basins (i.e. gallons I/I per acre per day and gallons I/I per inch-diameter-mile per day).

It should be also noted that the City contracts with the following agencies for wastewater conveyance and treatment services:

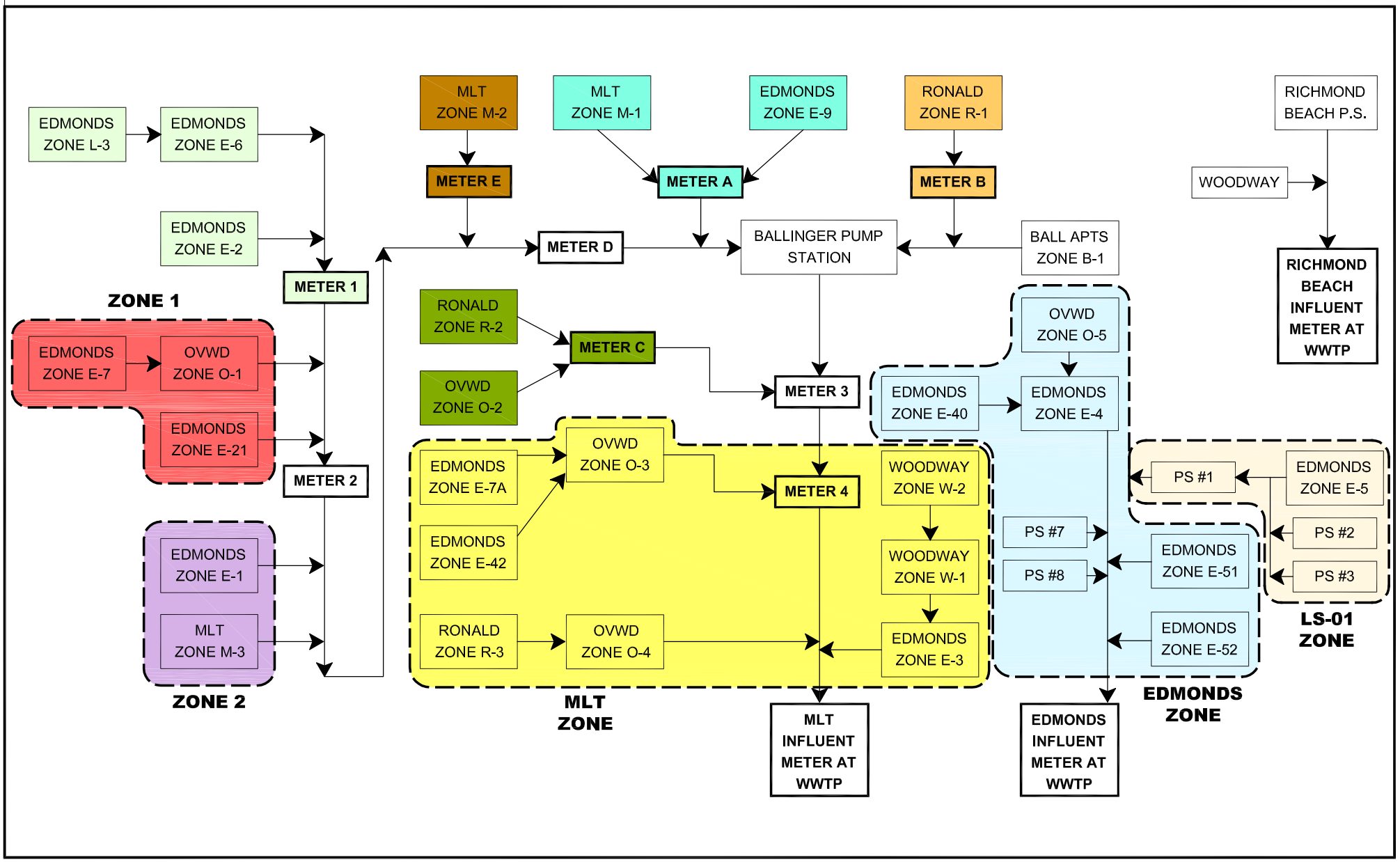
- City of Mountlake Terrace
- Ronald Sewer District
- Olympic View Water and Sewer District
- King County

The meter configuration allows a direct analysis of I/I contributions from Mountlake Terrace and Ronald Sewer District. Similarly, the flows that originate from Olympic View Water and Sewer District cannot be separated or isolated from the Edmonds flows without additional flow meter installation.

Flows from the Richmond Beach Pump Station include flows from the Town of Woodway and King County.

FILE NAME (UPDATED BY)	PLOT DATE & TIME
S:\CAD\EDMONDS\09-10166\DWG\F09-10166_FLOW DIA.DWG (GOC)	MAR 26 2010 13:54:45

XREFS: NONE



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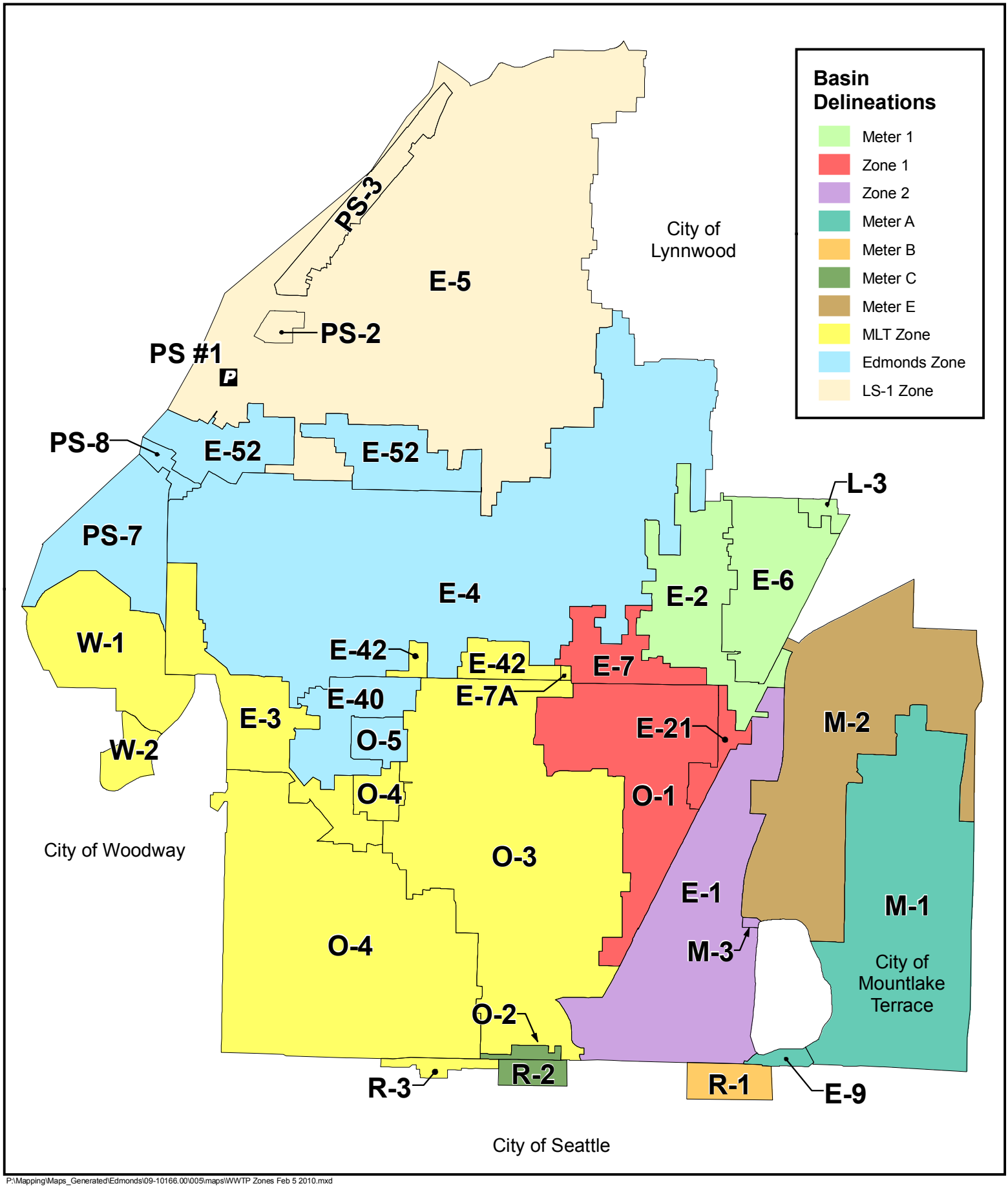
Schematic Flow Diagram

Edmonds I / I Study
Edmonds, Washington

Figure

1



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N W E S

Not To Scale

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Basin Delineations

Edmonds I/I Study
Edmonds, Washington

Figure 2

Table 1
Catchment and Tributary Areas

Metering Location	Subarea catchments			Area (acres)	Feet of pipe*		Aver Dia (inches)		Feet-inches of pipe	Inch Dia - Mile of pipe
Meter A										
(MLT)	M-1			1593.1	240,355		9.01		2,166,170	410.26
	E-9			9.3	1,578	+	28.82		45,478	8.61
	Total			1602.4	241,933				2,211,648	418.87
Meter B										
(RSD)	R-1			555.0	69,100		8.00		552,800	104.70
	Total			555.0	69,100				552,800	104.70
Meter C										
(RSD)	O-2			8.3	3,625	+	8.00		29,000	5.49
	R-2			135.0	19,700		8.00		157,600	29.85
	Total			143.3	23,325				186,600	35.34
Meter D										
	M-2	Meter E		663.0	49,442		7.78		384,659	72.85
	E-1	Zone 2		356.9	54,211		9.50	^	515,005	97.54
	M-3	Zone 2		1.6	363		23.21		8,425	1.60
	E-2	Meter 1	Meter 2	152.8	22,150		7.77	^	172,106	32.60
	L-3	Meter 1	Meter 2	10.5	93		8.00		744	0.14
	E-6	Meter 1	Meter 2	139.8	13,965		7.82	^	109,206	20.68
	E-7	Meter 2 - Meter 1 (Zone 1)	Meter 2	62.2	10,000		7.70	^	77,000	14.58
	O-1	Meter 2 - Meter 1 (Zone 1)	Meter 2	238.7	30,273		7.87	^	238,249	45.12
	E-21	Meter 2 - Meter 1 (Zone 1)	Meter 2	23.4	3,035		7.50	^	22,763	4.31
	Total			1648.8	183,532				1,528,155	289.42
Meter E										
	M-2			663.0	49,442		7.78		384,760	72.87
	Total			663.0	49,442				384,760	72.87
Meter 1										
	E-2			152.8	22,150		7.77	^	172,106	32.60
	L-3			10.5	93		8.00		744	0.14
	E-6			139.8	13,965		7.82	^	109,206	20.68
	Total			303.1	36,208				282,056	53.42

Table 1
Catchment and Tributary Areas

Metering Location	Subarea catchments				Area (acres)	Feet of pipe*		Aver Dia (inches)		Feet-inches of pipe	Inch Dia - Mile of pipe
Meter 2											
	E-2	Meter 1			152.8	22,150		7.77	^	172,106	32.60
	L-3	Meter 1			10.5	93		8.00		744	0.14
	E-6	Meter 1			139.8	13,965		7.82	^	109,206	20.68
	E-7	Meter 2 - Meter 1 (Zone 1)			62.2	10,000		7.70	^	77,000	14.58
	O-1	Meter 2 - Meter 1 (Zone 1)			238.7	30,273		7.87	^	238,249	45.12
	E-21	Meter 2 - Meter 1 (Zone 1)			23.4	3,035		7.50	^	22,763	4.31
	Total				627.4	79,516				620,067	117.44
Meter 3											
	M-1	Basin A			1593.1	240,355		9.01		2,166,170	410.26
	E-9	Basin A			9.3	1,578	+	28.82	^	45,478	8.61
	R-1	Basin B			555.0	69,100		8.00		552,800	104.70
	O-2	Basin C			8.3	3,625	+	8.00		29,000	5.49
	R-2	Basin C			135.0	19,700		8.00		157,600	29.85
	M-2	Meter E		Meter D	663.0	49,442		7.78		384,659	72.85
	E-1	Zone 2		Meter D	356.9	54,211		9.50	^	515,005	97.54
	M-3	Zone 2		Meter D	1.6	363		23.21		8,425	1.60
	E-2	Meter 1	Meter 2	Meter D	152.8	22,150		7.77	^	172,106	32.60
	L-3	Meter 1	Meter 2	Meter D	10.5	93		8.00		744	0.14
	E-6	Meter 1	Meter 2	Meter D	139.8	13,965		7.82	^	109,206	20.68
	E-7	Meter 2 - Meter 1 (Zone 1)	Meter 2	Meter D	62.2	10,000		7.70	^	77,000	14.58
	O-1	Meter 2 - Meter 1 (Zone 1)	Meter 2	Meter D	238.7	30,273		7.87	^	238,249	45.12
	E-21	Meter 2 - Meter 1 (Zone 1)	Meter 2	Meter D	23.4	3,035		7.50	^	22,763	4.31
	Total				3949.5	517,890				4,479,203	848.33
Lift Station No. 1											
	E-5	LS-01			1035.6	166,209		7.98	^	1,326,348	251.20
	PS #2	LS-01			12.0	1,526		8.43		12,864	2.44
	PS #3	LS-01			59.0	7,125		7.29	^	51,941	9.84
	Total				1106.6	174,860				1,391,153	263.48
Edmonds Meter											
	E-5	PS #1			1035.6	166,209		7.98	^	1,326,348	251.20
	PS #2	PS #1			12.0	1,526		8.43		12,864	2.44
	PS #3	PS #1			59.0	7,125		7.29	^	51,941	9.84

Table 1
Catchment and Tributary Areas

Metering Location	Subarea catchments					Area (acres)	Feet of pipe*		Aver Dia (inches)		Feet-inches of pipe	Inch Dia - Mile of pipe
	E-4	Edmonds Zone				1009.3	165,043		8.30	^	1,369,857	259.44
	E-40					81.8	11,505		7.24	^	83,296	15.78
	O-5					24.5	3,865		8.00	^	30,920	5.86
	E-52					156.2	27,288		8.11	^	221,306	41.91
	PS #7					130.7	4,007		7.27	^	29,131	5.52
	PS #8					13.3	1,616		14.14	^	22,850	4.33
	Total					2522.4	388,184				3,148,513	596.31
MLT Meter												
	M-1	Basin A			Meter 3	1593.1	240,355		9.01		2,166,170	410.26
	E-9					9.3	1,578	+	28.82	^	45,478	8.61
	R-1	Basin B				555.0	69,100		8.00		552,800	104.70
	O-2	Basin C				8.3	3,625	+	8.00		29,000	5.49
	R-2					135.0	19,700		8.00		157,600	29.85
	M-2	Meter E		Meter D		663.0	49,442		7.78		384,659	72.85
	E-1	Zone 2				356.9	54,211		9.50	^	515,005	97.54
	M-3					1.6	363		23.21		8,425	1.60
	E-2	Meter 1	Meter 2			152.8	22,150		7.77	^	172,106	32.60
	L-3					10.5	93		8.00		744	0.14
	E-6					139.8	13,965		7.82	^	109,206	20.68
	E-7	Meter 2 - Meter 1 (Zone 1)				62.2	10,000		7.70	^	77,000	14.58
	O-1					238.7	30,273		7.87	^	238,249	45.12
	E-21					23.4	3,035		7.50	^	22,763	4.31
	E-7A	MLT Zone				1.5	171		8.00		1,368	0.26
	E-42					39.2	3,753		7.99		29,986	5.68
	O-3					604.1	88,995		9.03	^	803,625	152.20
	W-1					155.4	10,911		8.00	^	87,288	16.53
	W-2					28.0	2,081		8.00	^	16,648	3.15
	E-3					146.9	23,872		13.39	^	319,646	60.54
	O-4					543.4	73,430		7.99	^	586,706	111.12
	R-3					14.3	895		8.00	^	7,160	1.36
	HS					41.1					-	-
	Total					5523.5	721,998				6,331,630	1,199.17

* Includes mainline only, no side sewers or laterals included
\+ Estimated length of pipe
^ Estimated pipe diameter to be 8" when no other information was available

III. Rainfall and Flow Data Reduction

The City's continuous flow meter readings for certain catchment areas, pump run records for the stations tributary to the City's WWTP and rainfall data as collected at the WWTP forms the basis for this analysis.

Flow and rainfall data for the period beginning in June 2006 and ending in December of 2008 were reviewed for all 10 flow meters and Lift Station 1. All rainfall data was reviewed in order to capsulate and segregate four flow and climatic conditions. Specifically the goal was to capture the following scenarios:

- *Dry weather flow during a period of low groundwater*. This condition reflects our baseline domestic flows with little or no infiltration or inflow
- *Minimal rain during a high groundwater period.* This condition was intended to capture and reflect infiltration coming from the groundwater without a significant inflow component.
- *Significant wet weather storm following a generally wet period.* This set of circumstances captures inflow component when the groundwater is already elevated.
- *Significant winter storm following a relative dry period.* This was intended to identify the inflow component.

The following time periods were selected to satisfy the conditions presented above:

- August 2008. The period was identified as a period of no or very little rain (low groundwater levels) leading up to August 18-20, 2008.
- April 2008. This time period was selected because of the sustained wet period through the spring of 2008. The supposition is that the groundwater level was elevated and sources of infiltration would manifest itself in similarly elevated base flows.
- December 25-30 2006. This time period contained the last of a series of "typical" December rain events. This rain event produced 1.39 inches of rain at the Edmonds WWTP on December 26-27.
- December 2-5, 2007. This was a significant rainfall event that produced 5.65 inches of rain at the WWTP between December 2nd and December 5th. This rain event led to widespread flooding and surcharging throughout the western Washington area. Some accounts have labeled this storm as a 50 year event.

Rainfall and flow data for these four storms for all 10 meters and Lift Station #1 were prepared and included in Appendix A.

The flow data from the drainage basin meters was reduced from 5 minute increments to hourly flow totals. Hourly rainfall data was prepared from data gathered from the rain gauge at the Edmonds WWTP.

The baseline flow data (i.e. no rain with low groundwater levels) of August 2008 show regular diurnal flow patterns and slight reaction to moderate summer showers. It is also interesting to note the variance between the weekend and weekday flow patterns. Weekend diurnal flow patterns tend to be slightly delayed and slightly higher than that seen during weekdays. This pattern is reflective of residents being at home on the weekends.

The April 2008 flow patterns show the same diurnal and weekend/weekday patterns as described above, however, the baseline is increased due to the higher groundwater levels. The response to the April 5th storm was immediate, but the baseline flows quickly returned to pre-storm levels. Minor storms that extended for approximately a day resulted in a response that quickly returned to baseline at the conclusion of the rain event. The basins appear to be insensitive to isolated and small showers.

The December 25th through 30th 2006 storms resulted in a significant response in increased flows at every metering station. The antecedent rainfall preceding December 25th delivered a significant amount of rain to the system. Rainfall continued through December 27th after which all rainfall ceased. The system slowly returned to normal over the course of the following five days.

The volume of water delivered during the December 2nd through 5th 2007 storm was unique in that the preceding period was very dry, but the storm was very intense for a two day period. The response was immediate, returning to pre-storm conditions over the course of two to three days. Storms later in that same month were characterized by a gradual increase in the baseline.

IV. Presentation of Historical Data

The measurement of I/I in terms of gallons per day per acre (gpad) and gallons per day per inch-diameter-mile (gpdpidm) was determined by calculating the average flows for the time period in question. For instance, the flow value for April and August were the average flows for the entire month. The average flow for the December 25th through 30th was the average for that six day period and similarly the average flow for the December 2nd through the 5th was determined by taking the total flow for that four day period and deriving the average for that period.

Those respective values were then divided by the total acreage for gpad and by the total inch-diameter-miles for gpdpidm. The results of those calculations are presented in Table 2. Table 2 also includes the average dry weather flows and the peak hour flows for the April and December storms.

Table 2
Basin Values

Basin/ Meter	Gallons/acre/day				Gallons/day/inch-diameter-mile				Flow, mgd			
										Peak Hour		
	August 2008	April 2008	December 25-30, 2006	December 2-5, 2007	August 2008	April 2008	December 25-30, 2006	December 2-5, 2007	Average Dry Month	April 2008	Dec 2006	Dec 2007
1	489	542	971	1,255	2,776	3,073	5,506	7,117	0.15	0.28	0.58	0.98
2	406	560	1,468	2,055	2,170	2,992	7,843	10,980	0.25	0.69	1.90	2.52
3	606	767	1,559	2,042	2,823	3,570	7,256	9,508	0.89	6.13	6.83	6.56
A	439	662	1,570	1,661	1,681	2,534	6,006	6,353	0.70	2.05	4.25	4.78
B	381	483	1,077	1,693	2,022	2,558	5,712	8,974	0.21	0.57	1.21	2.19
C	502	924	2,413	2,844	2,037	3,749	9,786	11,531	0.07	0.27	0.68	1.13
D	805	939	1,574	1,954	4,587	5,348	8,966	11,134	1.33	3.24	4.81	5.74
E	910	1,049	1,361	1,529	8,280	9,545	12,380	13,908	0.60	1.64	2.07	2.53
MLT at WWTP	292	767	1,021	903	1,343	3,535	4,701	4,158	1.44	7.50	8.35	9.76
LS-01	497	616	1,518	1,856	1,557	2,847	5,816	8,289	0.55	1.71	2.90	2.90
Edmonds at WWTP	605	737	1,499	1,968	2,560	3,116	6,341	8,324	1.49	4.55	14.02	11.59
Zone 1 (Meter 2 - Meter 1)	329	577	1,933	2,804	1,524	2,924	9,791	14,202	0.11	0.41	1.32	1.54
Zone 2 (Meter D-Meter E-Meter 2)	1,309	1,398	2,153	2,566	4,826	5,055	7,787	9,279	0.47	0.91	0.84	0.69
Edmonds Zone (EdMeter-LS-01)	665	801	1,423	1,976	2,830	3,409	6,055	8,404	0.94	2.84	11.12	8.69
MLT Zone (MLT Meter-Meter 3)	357	508	948	1,125	1,560	2,222	4,142	4,918	0.55	1.37	1.52	3.20

It is interesting to note that King County and other agencies have frequently used the measurement of gallons per acre per day to determine excessiveness of I/I. In fact, King County has used this measurement since 1961 with their component agencies that are tributary to their system. The threshold value permitted by their interlocal agreement is set at 1,100 gpad. During the County's Regional I/I program more than 800 flow meters were installed to measure the I/I values. Of those measured basins only a few dozen basins met the 1,100 gpad maximum allowable threshold. As a result the County considered, but has not yet adopted, a revised threshold of 1,500 gpad. The measurement of that threshold is generally defined as the flow volumes for any 30-minute period that exceeds 1,100 gpad. The values presented in Table 3 represent the calculated volume of I/I in excess of the summertime, dry weather baseline flows. This volume of I/I was determined by subtracting the August 2008 flows from the April 2008, December 2006 and December 2007 flows. This net increase in flows was the additional I/I components based on an average day, not the 30-minute event.

The larger sub-basins (Zone 1, Zone 2, MLT Zone, and Edmonds Zone) results were calculated by subtracting meter data and dividing by sub basin area or inch-diameter mile data for the sub-basin. When a subtraction process is used to determine results for a sub-basin, each meter subtraction reduces the reliability of the data. It should be noted that the data shown for the MLT meter at the treatment plant do not take into account the additional flows from the Ballinger pump station that is routed to the King County treatment system. The data is presented this way solely to facilitate the calculation of the results for the MLT Zone.

Average daily flows in August 2008 are assumed to be baseline domestic wastewater flows in all basins. Because average daily flow in April 2008 appears relatively insensitive to the minor rain events, the April 2008 flows were assumed to have the baseline wastewater flow plus the volume of infiltration water. Average daily August waste water flow was subtracted from average daily wastewater flow in April of 2008 to obtain the average daily flow of infiltration water. This was done for all metered basins. Additionally, August 2008 flows were subtracted from the December 2006 and December 2007 storms in order to estimate the total inflow and infiltration. The results of these calculations are shown in Table 3.

Peaking factors were calculated for April 2008, December 2007, and December 2006 rain events. The peaking factors were calculated using two sets of data. The first set was a peaking factor derived by dividing average gallon per acre-day flow by the August 2008 corresponding value. The second set of peaking factors was determined by taking the average dry weather flow divided into the peak hour flows for the April and December storms. These results are shown in Table 4.

Table 3
I/I Values

Basin / Meter	Gallons/acre/day			Gallons/in-mile-day		
	April 2008 - August 2008	December 2006 - August 2008	December 2007 - August 2008	April 2008 - August 2008	December 2006 - August 2008	December 2007 - August 2008
1	52	481	765	296	2,730	4,341
2	154	1,062	1,649	822	5,672	8,810
3	161	952	1,436	747	4,434	6,685
A	223	1,131	1,221	853	4,325	4,672
B	101	696	1,312	536	3,690	6,952
C	422	1,911	2,341	1,711	7,749	9,494
D	134	769	1,149	761	4,379	6,547
E	139	451	619	1,265	4,100	5,628
MLT at WWTP	476	729	611	2,192	3,358	2,815
LS-01	118	1,021	1,359	1,291	4,259	6,732
Edmonds at WWTP	131	894	1,363	556	3,781	5,764
Zone 1 (Meter 2 - Meter 1)	249	1,604	2,475	1,400	8,267	12,678
Zone 2 (Meter D- Meter E- Meter 2)	88	844	1,256	229	2,961	4,453
Edmonds Zone (EdMeter - LS-01)	136	758	1,310	579	3,225	5,574
MLT Zone (MLT Meter - Meter 3)	151	591	769	662	2,583	3,358

Table 4
I/I Peaking Factors

Basin / Meter	Ratio of I/I values (gpad)			Ratio of Peak Flows		
	April 2008 / August 2008	December 2006 / August 2008	December 2007 / August 2008	April 2008 / August 2008	December 2006 / August 2008	December 2007 / August 2008
1	1.1	2.0	2.6	1.9	3.9	6.5
2	1.4	3.6	5.1	2.7	7.5	9.9
3	1.3	2.6	3.4	6.9	7.7	7.4
A	1.5	3.6	3.8	2.9	6.0	6.8
B	1.3	2.8	4.4	2.7	5.7	10.4
C	1.8	4.8	5.7	3.7	9.4	15.7
D	1.2	2.0	2.4	2.4	3.6	4.3
E	1.2	1.5	1.7	2.7	3.4	4.2
MLT at WWTP	2.6	3.5	3.1	5.2	5.8	6.8
LS-01	1.2	3.1	3.7	3.1	5.3	5.3
Edmonds at WWTP	1.2	2.5	3.3	3.1	9.4	7.8
Zone 1 (Meter 2 - Meter 1)	1.8	5.9	8.5	3.9	12.4	13.1
Zone 2 (Meter D- Meter E- Meter 2)	1.1	1.6	2.0	1.9	1.8	1.5
Edmonds Zone (EdMeter - LS-01)	1.2	2.1	3.0	3.0	11.8	9.2
MLT Zone (MLT Meter - Meter 3)	1.4	2.7	3.2	2.5	2.8	5.8

The data presented in Tables 2, 3 and 4 include all flow measurement locations. Some of this data captures flow from several areas. Though the data is reliable, the larger catchment area tends to mask the specific origin and the severity of the I/I.

V. Recommendation for Smoke Testing

The following meters and their associated data, include data from combined basins:

- Meter 2
- Meter 3
- Meter D
- MLT flow meter at the WWTP
- Edmonds flow meter at the WWTP

Consequently, this data will be used to refine the catchment area by subtracting it from an upstream meter. This means that the data will be used in the following manner.

Direct read data:

- Meter 1
- Meter A
- Meter B
- Meter C
- Meter E
- LS-01

Single basin subtraction:

- Zone 1 (Meter 2 minus Meter 1)
- Edmonds Zone (Edmonds meter at WWTP minus LS-01)
- MLT Zone (MLT flow meter at WWTP minus Meter 3)

Double basin subtractions

- Zone 2 (Meter D minus Meter E minus Meter 2)

The direct read flow data will generally be considered the most reliable and the single basin subtraction data more reliable than the double basin subtraction data. However, all ten basins will be evaluated.

The other variable in analyzing the flow data is restricting the focus to those basins that collect flow only from, or predominately from, City of Edmonds customers. The non-Edmonds collection lines are of interest in determining the worst areas, however, those contract customers (i.e. Ronald S.D., Olympic View and Mountlake Terrace) are charged based on volume of flow delivered to the

Edmond's system. Consequently, the burden and incentive to correct extraneous I/I rests with the contract agencies, not the City of Edmonds.

With these constraints, the analysis has been confined to those basins that are exclusively or substantially within the City's control and jurisdiction.

The following listing defines the percentage of the basin that is owned and controlled by the City of Edmonds:

Basin / Meter	Percentage within Edmonds jurisdiction
• Meter 1	97%
• Meter A	0%
• Meter C	0%
• Meter E	0%
• LS-01	100%
• Zone 1	26%
• Edmonds Zone	98%
• MLT Zone	12%
• Zone 2	99%

The focus of our evaluation will be on those four basins that largely fall under the control and ownership of Edmonds and to a lesser degree those basins that partially include Edmonds' lines. Specifically this includes basins Meter 1, LS-01, Zone 1, Edmonds Zone, MLT Zone and Zone 2. The I/I values and peaking factors are restated in Table 5 for these six basins.

A comparison of these six basins seems to point to Zone 1 as having the highest values. The second worst or critical basin is not as easily determined. Basin LS-01 shows the next worst values in terms of I/I volume as measured by the gallons per acre per day, gallons per inch-diameter-mile and the peaking factors associated with those values. Keep in mind that those values are determined based on the average volume of I/I over the course of the storm. The other metric is the peaking factor associated with peak flows. Using this metric the Edmonds Zone basin would be considered the next most critical basin.

Zone 1 has approximately 43,300 linear feet of pipe; however, LS-01 has nearly 175,000 feet. The rule of thumb that we have found to be a good threshold is to limit the footage of pipe to 20,000 to 40,000 when trying to define the sources through smoke testing. Basins with footage much greater than this range tends to be difficult to trace down the source of I/I. Smoke testing in Zone 1 seems to be reasonably close to limit and it is expected to identify the individual sources. LS-01, however, is significantly greater than this threshold and is likely to create some challenges in refining the origins of the I/I sources.

Table 5
I/I Values and Peaking Factors for Six Edmonds Basins

Basin / Meter	Gallons/acre/day			Gallons/in-mile-day			Peaking factors (gpad)			Peaking factors (flow)		
	Apr 2008 - Aug 2008	Dec 2006 - Aug 2008	Dec 2007 - Aug 2008	Apr 2008 - Aug 2008	Dec 2006 - Aug 2008	Dec 2007 - Aug 2008	Apr 2008 / Aug 2008	Dec 2006 / Aug 2008	Dec 2007 / Aug 2008	Apr 2008 / Aug 2008	Dec 2006 / Aug 2008	Dec 2007 / Aug 2008
1	52	481	765	296	2,730	4,341	1.1	2.0	2.6	1.9	3.9	6.5
LS-01	118	1,021	1,359	1,291	4,259	6,732	1.2	3.1	3.7	3.1	5.3	5.3
Zone 1 (Meter 2 - Meter 1)	249	1,604	2,475	1,400	8,267	12,678	1.8	5.9	8.5	3.9	12.4	13.1
Zone 2 (Meter D- Meter E- Meter 2)	88	844	1,256	229	2,961	4,453	1.1	1.6	2.0	1.9	1.8	1.5
Edmonds Zone (EdMeter - LS-01)	136	758	1,310	579	3,225	5,574	1.2	2.1	3.0	3.0	11.8	9.2
MLT Zone (MLT Meter - Meter 3)	151	591	769	662	2,583	3,358	1.4	2.7	3.2	2.5	2.8	5.8

Worst Basin
2nd Worst Basin
3rd Worst Basin

The recommendation of this report is to smoke test Zone 1. It is recognized that only 26% of this basin is under the jurisdiction of the City, but it is a discrete basin with likely identifiable sources of I/I that are tributary to the City's plant. If the City elects to focus their attention to another basin that includes a greater percentage of City infrastructure, then efforts should be directed to Basin LS-01 or the Edmonds Zone basin.

VI. Capital Improvement Projects

The proposed Capital Improvement List consists of three components:

1. Initial and subsequent smoke testing and resulting CIP
2. Correction of chronic and frequent flooding areas
3. Correction of chronic and routine maintenance efforts

Smoke Testing Recommendations and Resulting CIP

The recommendation is to smoke test Zone 1. It is clear that only a minor portion of Zone 1 falls within the jurisdiction of the City. However, preliminary discussions with the Olympic View Water and Sewer District (OV) seems to indicate their willingness to perform the smoke testing on their portion of this Zone. OV has experienced some surcharging and localized flooding issues in this same basin. Their interest is two-fold. First to relieve the surcharging conditions and thereby avoid or postpone a capital project for added capacity and secondly to reduce treatment capacity charges to the City.

Correction of chronic and frequent flooding areas

In addition to the identified I/I sources resulting from the smoke testing, the City staff has also identified other known problem areas that frequently surcharge or result in flooding. These reoccurring problems are well known to the City staff. Some of these flooding areas can be resolved with a local CIP project as noted in Table 6.

These chronic problem areas are identified below. The corresponding numbers of the descriptions below match with the presentation numbers on Figure 3:

1. 727 Melody Lane, MH 244-8, surcharges and overflows down customers driveway during heavy storms. Preventing overflows at this location will flood houses. Downstream flow constriction will require a basin hydraulic analysis.
2. 1111 Brookmere, MH 265-8, house floods out of basement plumbing and MH surcharges during heavy storms
3. 224th St. SW & 77 Ave W, MH 4-13, surcharges during hard storms and needs to be bypass pumped into a MH at the end of 77th Ave W so sewer does not back up into homes on 224th.

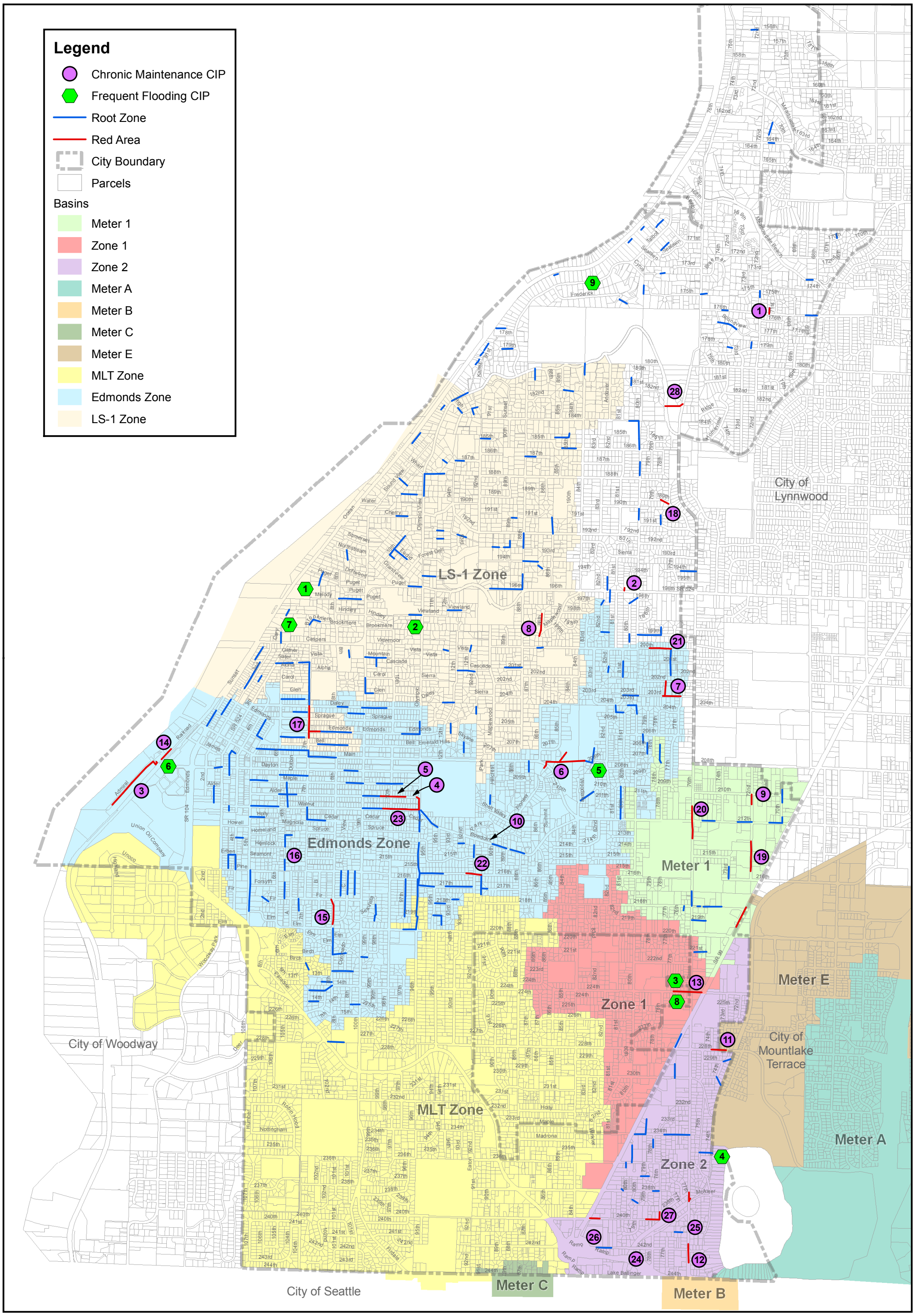
Table 6
Capital Improvement Projects

Category		Year							
		2010	2011	2012	2013	2014	2015	2016	2017
Smoke Testing and Resulting CIP									
	Smoke Test Zone 1 (Edmonds portion only)	$ 25,000							
	CIP from Zone 1 (Edmonds portion only)**		$ 700,000						
	Meter Installations in Basin LS-01			$ 20,000					
	Smoke Test in Basin LS-01				$ 75,000				
	CIP in Basin LS-01 **					$ 700,000			
	Meter Installation in Basin Edmonds Zone					$ 20,000			
	Smoke Testing in Edmonds Zone						$ 100,000		
	CIP in Edmonds Zone **							$ 700,000	
Chronic and Frequent Flooding									
1	MH 244-8 overflow - downstream hydraulic analysis req'd		+++						
2	In-line check valve on side sewer (1111 Brookmere)		$ 1,500						
3	In-line check valve on side sewer (along 224th)		$ 1,500						
4	Gasketed ring and cover at MH 48-17		+++						
5	Gasketed ring and cover at MH 224-9		+++						
6	Gasketed ring and cover at MH 15 and 16			$ 1,500					
7	Gasketed ring and cover at MH 298 and 299			$ 1,500					
8	Flow meter at MH 152A-13				$ 20,000				
9	Gasketed ring and cover (or rainstop) at MH 80-2				$ 1,500				
Reoccuring Maintenance Issues									
1	7117 176th Street SW. 30 foot belly and 150 feet of roots						$ 100,000		
2	8015 196th Street SW. Sixty feet of 6-inch line.						$ 30,000		
3	465 Admiral Way. 1500 feet of 8-inch line.						$ 750,000		
4	1053 Alder Street. 330 feet of 8-inch line.						$ 170,000		
5	949 Alder St. 600 feet of 8-inch line. Also see Comprehensive Sewer Plan Problem 7		$ 35,000	$ 345,000					
6	Pine Ridge Park, 8610 Main St, 8529 Main St and 8400 204th St SW. 1,325 feet 8- and 10-inch line.								$ 650,000
7	7703 203rd Street. 700 feet of 8-inch line.								$ 350,000
8	8705 Maplewood Ln. 350 feet of 8-inch line.								$ 175,000
9	7122 210th St. 300 feet of 8-inch line.								$ 150,000
10	9126 Bowdoin St. 120 feet of 6-inch lateral.								$ 60,000
11	7313 228th St SW. 350 feet of 8-inch line								$ 175,000
12	7530 242nd Pl SW. 350 feet of 8-inch line								$ 175,000
13	Sanitary Sewer Comprehensive Plan – Problem 11. On 224th St at 76th Ave. 800 feet of 8-inch pipe		$ 30,000	$ 290,000					

Table 6
Capital Improvement Projects

Category	Year							
	2010	2011	2012	2013	2014	2015	2016	2017
14 Sanitary Sewer Comprehensive Plan – Problem 12. On Beach at Dayton St. Approximately 350 feet of 6-inch pipe replaced with 8-inch		$ 15,000	$ 155,000					
15 Sanitary Sewer Comprehensive Plan – Problem 18. On 8th Ave S between Fir and Elm St. 600 feet of 8-inch line			$ 26,000	$ 234,000				
16 Sanitary Sewer Comprehensive Plan – Problem 19. On Hemlock St. 800 feet of 8-inch line			$ 40,000	$ 365,000				
17 Sanitary Sewer Comprehensive Plan – Problem 20. On 7th Ave N. 500 feet of 8-inch line			$ 50,000	$ 450,000				
18 Sanitary Sewer Comprehensive Plan – Problem 21. On Dellwood Dr. 500 feet of 8-inch line		$ 20,000	$ 200,000					
19 Sanitary Sewer Comprehensive Plan – Problem 22. On 72nd Ave W. 500 feet of 8-inch line			$ 25,000	$ 225,000				
20 Sanitary Sewer Comprehensive Plan – Problem 23. On 76th Ave W. 500 feet of 8-inch line			$ 25,000	$ 225,000				
21 Sanitary Sewer Comprehensive Plan – Problem 24. On 200th St SW. 250 feet of 8-inch line			$ 20,000	$ 225,000				
22 Sanitary Sewer Comprehensive Plan – Problem 25. On 216th St SW. 350 feet of 8-inch line			$ 15,000	$ 155,000				
23 Sanitary Sewer Comprehensive Plan – Problem 26. On Walnut at 96th Ave. 1000 feet of 8-inch line					$ 45,000	$ 405,000		
24 Sanitary Sewer Comprehensive Plan – Problem 27. On Northwest Traction right-of-way. 700 feet of 8-inch line					$ 30,000	$ 330,000		
25 Sanitary Sewer Comprehensive Plan – Problem 28. On 76th Ave W. 150 feet of 8-inch line					$ 5,000	$ 80,000		
26 Sanitary Sewer Comprehensive Plan – Problem 29. On 240th St SW. 250 feet of 8-inch line					$ 10,000	$ 120,000		
27 Sanitary Sewer Comprehensive Plan – Problem 30. On 238th St SW. 800 feet of 8-inch line						$ 40,000	$ 390,000	
28 Sanitary Sewer Comprehensive Plan – Problem 31. Off of Olympic View Dr at 76th Ave. 400 feet of 8-inch line							$ 250,000	
TOTAL	$25,000	$803,000	$1,214,000	$1,975,500	$810,000	$2,125,000	$1,340,000	$1,735,000

** Placeholder amount. Final amount is dependent on results of the smoke testing.
+++ Downstream Hydraulic Analysis required to prevent surcharging at this MH.



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CITY OF EDMONDS Inc. 1890

Root Zones and Red Areas

Edmonds I/I Study
Edmonds, Washington
May 12, 2010

Figure 3

P:\Mapping\Maps_Generated\Edmonds\09-10166.00\006\maps\Fig 3 Rootzone & Red Area 11x17.mxd

4. 23615 74th Ave W, MH 48-17, when lake rises during hard storms the manhole surcharges flowing sewage into the lake, then takes inflow from the lake into the manhole as the lake rises over the manhole and the sewer recedes in the main line. Preventing overflows at this location will flood houses. Downstream flow constriction will require a basin hydraulic analysis.
5. 20830 Woodlake Dr., MH 224-9, pond rises and MH goes under water backing sewage out of a cleanout at 20830. Preventing overflows at this location will flood houses. Downstream flow constriction will require a basin hydraulic analysis.
6. Between SR104 and Railroad Ave. on Dayton, MH 15 & 16 flood when the street floods during hard storms.
7. 832 and 828 Cary Rd., MH 298-8 and 299-8 go under water during hard storms when the creek floods.
8. MH 152A-13 (between 82nd and 83rd Avenue on 220th Street) could use a flow meter to calculate flows going into the Olympic View service area to see if we are contributing to their high flows on 224th and 77th Ave W.
9. MH 80-2, MH 78-2, 8403 and 8307 Talbot Rd. Manholes under water during storms.

<u>Correction of chronic and routine maintenance efforts</u>

There are dozens of regular and reoccurring maintenance efforts throughout the City. These areas include those pipe segments that are on the City's routine maintenance schedule and might include flushing of the lines that have sags in the alignment, root intrusion and grease accumulations. The City staff has characterized these chronic areas as the Red Area problems (which are the highest priority) and the Root Zone which require attention but generally on a less frequent basis. These areas are graphically presented on Figure 3.

The following are a brief description of the Red Area problems, corresponding numbers are shown on Figure 3. Problem areas 1 through 12 were collected from the maintenance staff and problems 13 through 26 were included in the previous Sanitary Sewer Comprehensive Plan.

1. 7117 176th Street SW. Thirty foot belly and 150 feet of roots (Sheet 3-93 to Sheet 3-94 c/o).
2. 8015 196th Street SW. Sixty feet of 6-inch line with belly and sag (Sheet 5-334A).
3. 465 Admiral Way. Approximately 1500 feet of 8-inch line beginning at MH 2 through MH 6 with bellies, flat grade and grease accumulations (Sheet 7).
4. 1053 Alder Street. 330 feet of 8-inch line with flat grade and bellies (Sheet 8-32B to Sheet 12-2 and Sheet 8-32A to Sheet 8-32B).

5. 949 Alder Street. Approximately 600 feet of 8-inch line with flat grades and bellies (Sheet 8-30 to Sheet 8-31 and Sheet 8-31 to Sheet 8-32). Also refer to Comprehensive Sewer Plan Problem 7.
6. Pine Ridge Park area, 8610 Main Street, 8529 Main Street and 8400 204th Street SW. Approximately 1,325 feet 8- and 10-inch line. Manholes 9-18, 9-19, 9-20, 9-201, 9-202 and 9-224.
7. 7703 203rd Street. Approximately 700 feet of 8-inch line with bellies and flat grade (Sheet 9-314 to Sheet 9-313 and Sheet 9-366 Sheet 9-314).
8. 8705 Maplewood Lane. Approximately 350 feet of 8-inch line with bellies and flat grade (Sheet 9-137 to Sheet 9-138).
9. 7122 210th Street. Approximately 300 feet of 8-inch line with bellies and grease accumulation (Sheet 10-23 to Sheet 10-25).
10. 9126 Bowdoin Street. Approximately 120 feet of 6-inch lateral with flat grade and root intrusion.
11. 7313 228th Street SW. Approximately 350 feet of 8-inch line with bellies (Sheet 14-65 to Sheet 14-66).
12. 7530 242nd Pl SW. Approximately 350 feet of 8-inch line with bellies (Sheet 17-81 to Sheet 17-80).
13. Sanitary Sewer Comprehensive Plan – Problem 11. On 224th at the intersection with 76th Avenue. Approximately 800 feet of 8-inch pipe.
14. Sanitary Sewer Comprehensive Plan – Problem 12.On Beach Place at the intersection with Dayton Street. Replace approximately 350 feet of 6-inch line with 8-inch pipe.
15. Sanitary Sewer Comprehensive Plan – Problem 18. On 8th Avenue South between Fir and Elm Street. Approximately 600 feet of 8-inch line with flat grade.
16. Sanitary Sewer Comprehensive Plan – Problem 19. On Hemlock Street. Approximately 800 feet of 8-inch line with numerous bellies.
17. Sanitary Sewer Comprehensive Plan – Problem 20. On Seventh Avenue North. Approximately 500 feet of 8-inch line with numerous bellies.
18. Sanitary Sewer Comprehensive Plan – Problem 21. On Dellwood Drive. Approximately 500 feet of 8-inch line with numerous bellies and accumulation of grease.
19. Sanitary Sewer Comprehensive Plan – Problem 22. On 72nd Avenue West. Approximately 500 feet of 8-inch line with numerous bellies and accumulation of grease.
20. Sanitary Sewer Comprehensive Plan – Problem 23. On 76th Avenue West. Approximately 500 feet of 8-inch line with numerous bellies and accumulation of grease.
21. Sanitary Sewer Comprehensive Plan – Problem 24. On 200th Street SW. Approximately 250 feet of 8-inch line with numerous bellies, flat grade and accumulation of solids.
22. Sanitary Sewer Comprehensive Plan – Problem 25. On 216th Street SW. Approximately 350 feet of 8-inch line with numerous bellies and accumulation of grease.

23. Sanitary Sewer Comprehensive Plan – Problem 26. On Walnut between 96th Avenue and 9th Avenue South. Approximately 1000 feet of 8-inch line with flat grade and accumulation of solids.
24. Sanitary Sewer Comprehensive Plan – Problem 27. On Northwest Traction right-of-way. Approximately 700 feet of 8-inch line with flat grade, bellies and accumulation of solids and grease.
25. Sanitary Sewer Comprehensive Plan – Problem 28. On 76th Avenue West. Approximately 150 feet of 8-inch line with flat grade.
26. Sanitary Sewer Comprehensive Plan – Problem 29. On 240th Street SW. Approximately 250 feet of 8-inch line with bellies and grease accumulation.
27. Sanitary Sewer Comprehensive Plan – Problem 30. On 238th Street SW. Approximately 800 feet of 8-inch line with bellies and grease accumulation.
28. Sanitary Sewer Comprehensive Plan – Problem 31. Off of Olympic View Drive at 76th Avenue. Approximately 400 feet of 8-inch line with bellies and root intrusion.

VII. Proposed Standards, Policies and Guidelines

The proposed standards, policies and guidelines described herein address a wide range of topics, including sewer evaluations, connections to side sewers, pipeline and manhole leak inspections, system maintenance, and construction practices and materials for I/I control projects.

They are intended to:

- Guide the engineering and construction of future system infrastructure (both new and rehabilitated) to achieve long-term I/I control

- Limit system degradation and I/I increases over time

Some of the subjects covered are as follows:

- Establish proper construction practices and materials for I/I repair and rehabilitation projects

- Encourage appropriate inspection and testing prior to acceptance of new or rehabilitated sections of sewer

- Develop inspection and repair standards for new and existing structures on private property

- Encourage appropriate system maintenance

- Provide appropriate predesign, investigation of I/I conditions, inspection of construction, and enforcement of standards.

The proposed standards, policies and guidelines address only features of the public and private sewer systems associated with I/I. They are intended to augment and emphasize individual City standards which outline requirements for overall sewer system design, construction and rehabilitation.

A total of 33 Standards, 17 Policies and 7 Guidelines have been developed for the City's consideration in formulating an effective, on-going I/I Control Program for City-wide implementation as needed. They are derived from a set of similar draft requirements prepared for King County under its Regional I/I Control Program. The County's draft standards and policies reflect extensive input from the Engineering & Planning Subcommittee of the Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC), of which the City of Edmonds is one of the 34 member agencies.

Funding Options
While the overall objective of an I/I program would be reduction of capital and O&M costs, with the potential reduction in rates, options for ensuring compliance with I/I standards include whether or not surcharges or incentives should be established.

Surcharges are an additional fee that could be charged to City customers for exceeding a predetermined I/I threshold or for causing increased costs related to conveying and treating I/I.

Incentives provide financial rewards, in the form of lower rates or rebates, to City customers for reducing I/I flow.

Cost sharing can spread the cost of a project among the City, State and Ratepayers through a variety of options.

Private Property
The cost and potential disruption associated with reducing I/I from private property sources are considerable and affect the ability and willingness of property owners to undertake corrective actions.

There are also constraints, including issues of legality and equity that the City must address if public funding is used to defray some or all of the cost of private sewer rehabilitation.

Public Education
Experience elsewhere indicates that property owner participation increases with knowledge about I/I and its impacts on the cost of wastewater conveyance,

treatment and disposal. Implementation of an I/I reduction/control program, especially as it includes private property and/or rate issues, necessitates some amount of public education and involvement.

PROPOSED STANDARDS, POLICIES & GUIDELINES

Each standard, policy or guideline is listed in Appendix B, and consists of the following:

- **Title** – A brief name of the Standard
- **Control Measure Description** – A description of why the Standard is being proposed
- **Standard/Policy/Guideline** – A description in sufficient detail for engineers and City representatives to compare with existing standards
- **Potential City Impacts** – Indicates the potential impact on the City, including additional staffing requirements and other aspects of daily operations. Elements that could add or reduce costs to normal processes are listed.
- **Potential Impacts to Ratepayers** – Indicates potential impact to Ratepayers on private property. Elements that could add or reduce costs to normal processes are listed.

The following table provides a summary and brief description of the proposed Standards, Policies and Guidelines (See Appendix B for a detailed description of the proposed action).

SUMMARY OF PROPOSED STANDARDS, POLICIES & GUIDELINES

Number	Title	Rehab Projects Only	Both New & Rehab
STANDARDS			
Standard 1	Storm Drainage Connections to the Sanitary Sewer		√
Standard 2	Connections to Existing System		√
Standard 3	Allowable Connections to Side Sewers		√
Standard 4	Visual Inspection of Manholes for SSES Investigations	√	

Number	Title	Rehab Projects Only	Both New & Rehab
Standard 5	Closed Circuit Television (CCTV) Inspection of Sewers for SSES Investigation	√	
Standard 6	Smoke Testing for SSES Investigations	√	
Standard 7	Dye Testing for SSES Investigations	√	
Standard 8	Design Capacity for Pipeline Rehabilitation Projects	√	
Standard 9	Pipe Anchoring		√
Standard 10	Manhole Location & Covers		√
Standard 11	Manhole Size		√
Standard 12	Sewer System Design		√
Standard 13	Manhole Joints		√
Standard 14	Side Sewer Connection Location & Taps		√
Standard 15	Abandonment Requirements		√
Standard 16	Pipe Materials		√
Standard 17	Pipe Rehabilitation Methods	√	
Standard 18	Inspection Wyes / Cleanouts		√
Standard 19	Inspection of Pipe Installation & Backfill		√
Standard 20	Pipe Zone Bedding & Trench Backfill		√
Standard 21	Manhole Leveling Rings		√
Standard 22	Root Intrusion	√	
Standard 23	Root Intrusion (Private Property)	√	
Standard 24	Pipeline Leak Testing		√
Standard 25	Side Sewer Visual Inspection		√
Standard 26	Side Sewer/Lateral Leak Testing		√
Standard 27	Manhole Leak Testing		√

Number	Title	Rehab Projects Only	Both New & Rehab
Standard 28	Product Specific Inspection		√
Standard 29	Product Specific Inspection (Private Property)		√
Standard 30	CCTV Inspection		√
Standard 31	Side Sewer CCTV Requirements		√
Standard 32	Certification, Warranty & Qualifications		√
Standard 33	Bonding & Warranty Inspections		√

POLICIES

Policy 1	Public Awareness of I/I: Educational Materials		√
Policy 2	Responsibility for Community		√
Policy 3	Public Funding for I/I Reduction Projects		√
Policy 4	Rates, Incentives & Surcharges		√
Policy 5	Cost Sharing		√
Policy 6	Storm Water Drainage Ordinances		√
Policy 7	Responsibility for Storm Water Drainage		√
Policy 8	Infeasible or Prohibitively Expensive Modifications		√
Policy 9	Contractor Qualifications		√
Policy 10	Required Permits		√
Policy 11	Inspection Training		√
Policy 12	Property Restoration	√	
Policy 13	Bonding, Licensing, Insurance and Warranty Provisions		√
Policy 14	Access to Private Property		√
Policy 15	Limiting Liability		√
Policy 16	Legislative Action Requirements		√

Number	Title	Rehab Projects Only	Both New & Rehab
Policy 17	Side Sewer Ownership & Responsibility		√

GUIDELINES

Guideline1	Modeling and Engineering Analysis		√
Guideline 2	Lateral and Side Sewer Rehabilitation Methods	√	
Guideline 3	Pipe Protection / Depth of Cover		√
Guideline 4	Manhole Rehabilitation	√	
Guideline 5	Spot Repairs	√	
Guideline 6	Spot Repairs (Private Property)	√	
Guideline 7	Manhole Lids/Inserts	√	

Adoption of these standards, policies and guidelines should be prioritized to facilitate a systematic incorporation of the governance surrounding these I/I issues. Table 7 that follows has divided the standards, policies and guidelines into five categories:

1. Public Education
2. Implementation
3. Planning and Design
4. New Construction
5. Existing Facilities

It is recommended that those standards, policies and guidelines that are bolded and shaded should be incorporated first.

Table 7
Prioritzation of Standards, Policies and Guidelines

Major Category	Application	Item No.		I/I Reduction Potential	City Staffing Impact
EDUCATION	All	**P1**	**Public Awareness: Educational Materials**	Long Term	Low
		P2	**Responsibility for Community Education**	Long Term	Low
IMPLEMENTATION (COUNCIL ACTION)	All	**P3**	**Public Funding for I/I Reduction Projects**		
		P4	**Rates, Incentives & Surcharges**		Medium
		P17	**Side Sewer Ownership & Responsibility**		
		P5	Cost Sharing		
PLANNING/DESIGN	All	**P9**	**Contractor Qualifications**	Long Term	
		P11	**Inspection Training**		Medium
		P6	Stormwater Drainage Ordinances		
		P10	Required Permits		
		P16	Legislative Action Requirements		
NEW CONSTRUCTION	All	**S19**	**Inspection of Pipe Installation & Backfill**	Long Term	Low
		S32	**Certification, Warranty & Qualifications**	Long Term	Low
		P7	Responsibility for Stormwater Drainage		
		S9	Pipe Anchoring		
		S16	Pipe Materials		
	PUBLIC Only	**S24**	**Pipeline Leak Testing**	Long Term	Low
		S27	**Manhole Leak Testing**	Long Term	Low
		S30	**CCTV Inspection**	Long Term	Medium
		S1	**Storm Drainage Connections to Sanitary Sewer**	Long Term	Low
		G1	Modeling & Engineering Analysis		
		S10	Manhole Location & Covers		
		S11	Manhole Size		
		S12	Sewer System Design		
		S13	Manhole Joints		
		S21	Manhole Leveling Rings		
		S28	Product Specific Inspection		
	PRIVATE Only	**S3**	**Allowable Connections to Side Sewers**	Long Term	Medium
		S14	**Side Sewer Connection Location & Taps**		Low
		S20	**Pipe Zone Bedding & Trench Backfill**	Long Term	Low
		S25	**Side Sewer Visual Inspection**		Low
		S26	**Side Sewer/Lateral Leak Testing**	Long Term	
		S31	**Side Sewer CCTV Requirements**	Long Term	Low
		P8	Infeasible or Prohibitively Expensive Modifications		
		S18	Inspection Wyes/Cleanouts		
		G3	Pipe Protection/Depth of Cover		
		S29	Product Specific Inspection (Private Property)		
		S33	Bonding & Warranty Inspections		
EXISTING CONSTRUCTION	All	**S5**	**CCTV Inspection of Sewers for SSES**	Long Term	Low
		S6	**Smoke Testing for SSES**		Low
		S7	**Dye Testing for SSES**		Low
		S19	**Inspection of Pipe Installation & Backfill**	Long Term	Low
		P7	Responsibility for Storm Drainage		
		P13	Bonding, Licensing, Insurance & Warranty		
		S8	Design Capacity for Pipeline Rehab Projects		
		S15	Abandonment Requirements		
		S16	Pipe Materials		
		S17	Pipe Rehabilitation Methods		
		S22	Root Intrusion		
		S32	Certification, Warranty & Qualifications		
	PUBLIC Only	**S2**	**Connections to Existing Systems**		
		G5	**Spot Repairs**	Medium	Low
		S24	**Pipeline Leak Testing**	Long Term	
		S30	**CCTV Inspection**	Long Term	Medium
		S4	Visual Inspection of Maholes for SSES		
		G1	Modeling & Engineering Analysis		
		G4	Manhole Rehabilitation		
		S21	Manhole Leveling Rings		
		G7	Manhole Lids/Inserts		
		S28	Product Specific Inspection		
	PRIVATE Only	**P14**	**Access to Private Property**		Low
		S3	**Allowable Connections to Side Sewers**	Long Term	Medium
		S14	**Side Sewer Connection Location & Taps**		Low
		S20	**Pipe Zone Bedding & Trench Backfill**	Long Term	Low
		S31	**Side Sewer CCTV Requirements**	Long Term	Low
		P8	Infeasible or Prohibitively Expensive Modifications		
		P12	Property Restoration		
		P15	Limiting Liability		
		G2	Lateral & Side Sewer Rehabilitation Methods		
		S18	Inspection Wyes/Cleanouts		
		G3	Pipe Protection/Depth of Cover		
		G6	Spot Repairs (Private Property)		
		S33	Bonding & Warranty Inspections		

APPENDIX A

Flow Data from

August 2008, April 2008, December 2006 and December 2007

Meter 1

Meter 2

Meter 3

Meter A

Meter B

Meter C

Meter D

Meter E

Edmonds Meter

MLT Meter

Lift Station No. 1

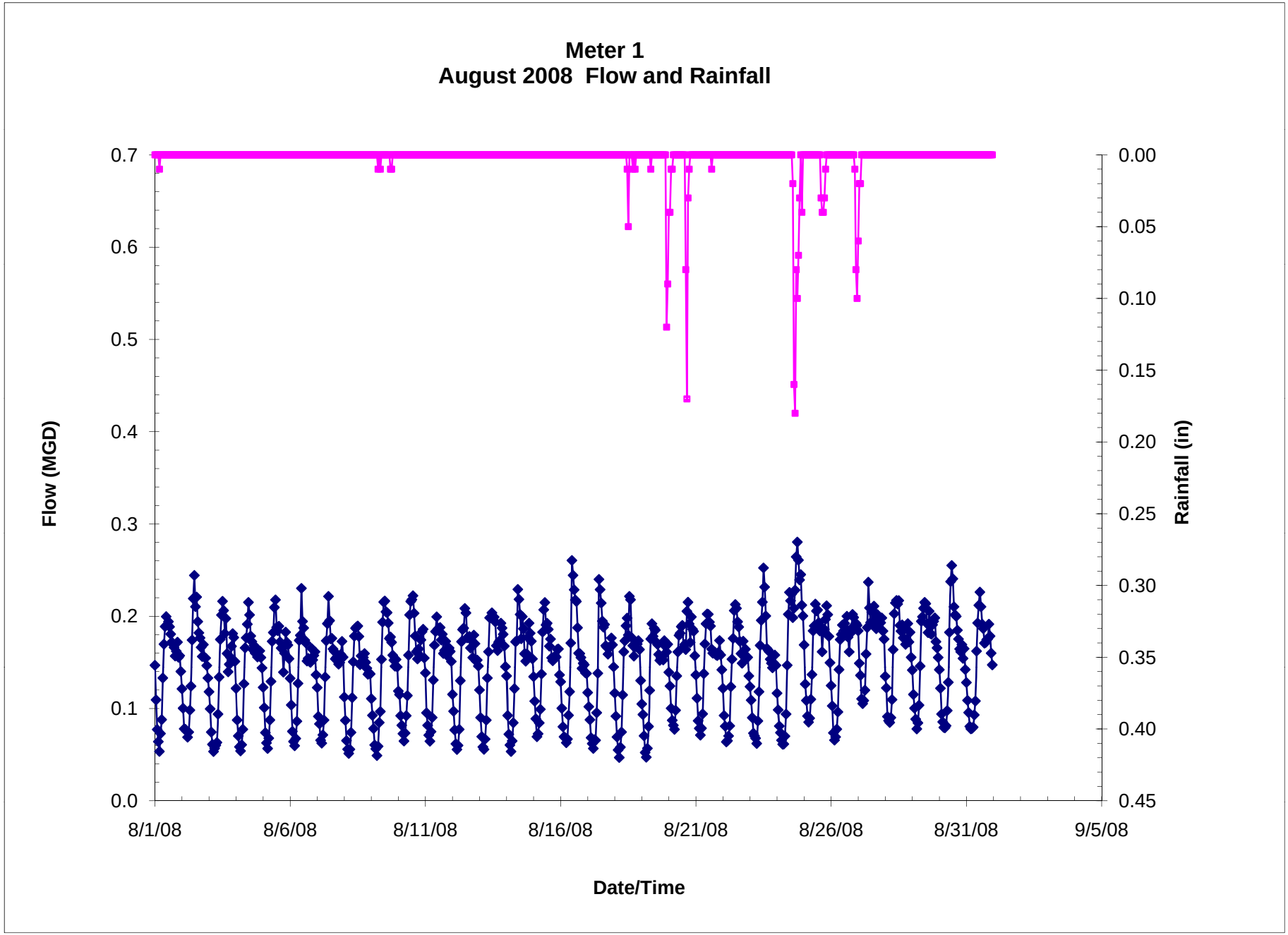
Meter 1

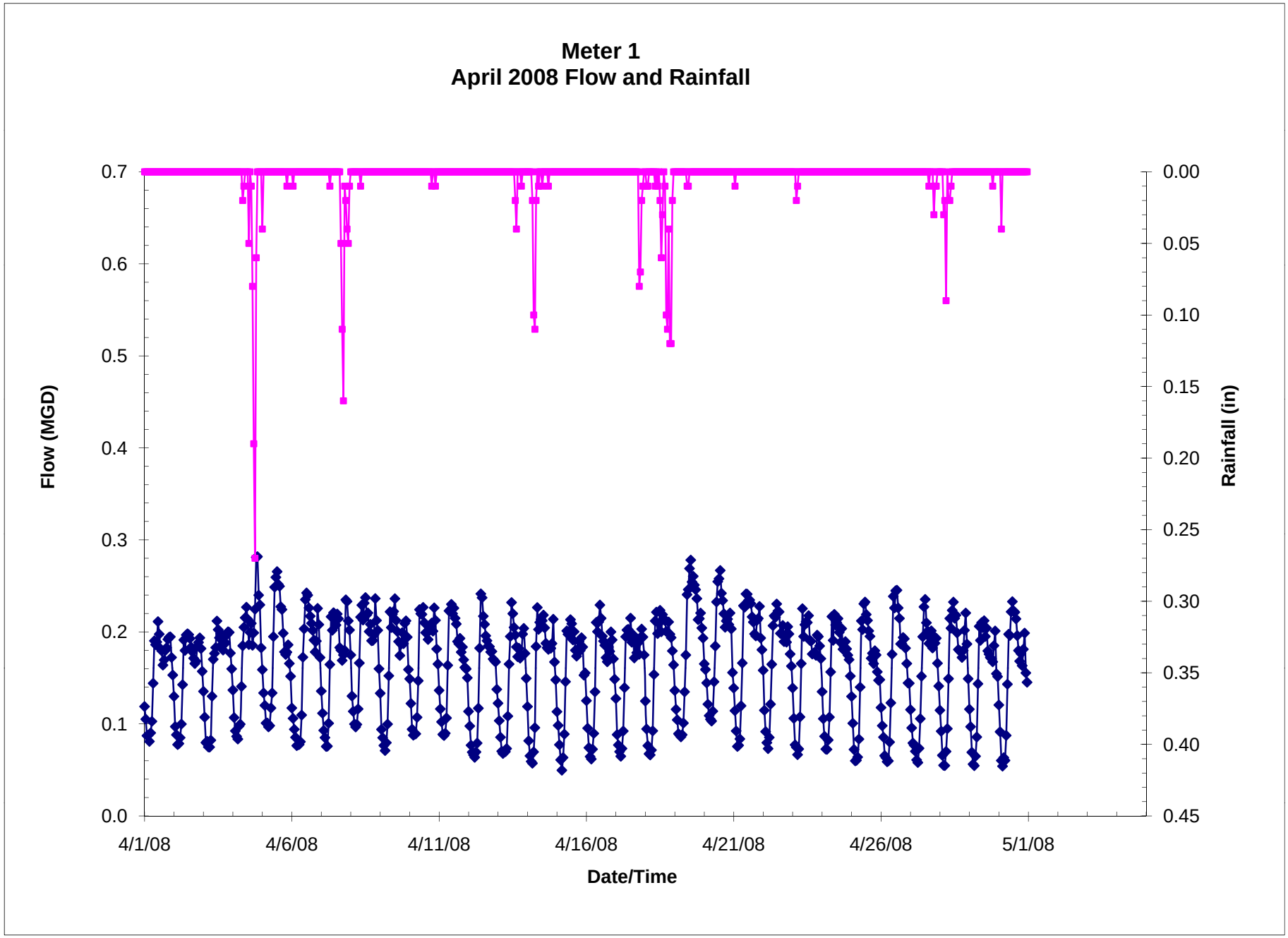
August 2008

April 2008

December 2006

December 2007


Meter 1
August 2008 Flow and Rainfall
Flow (MGD)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
9/5/08
Date/Time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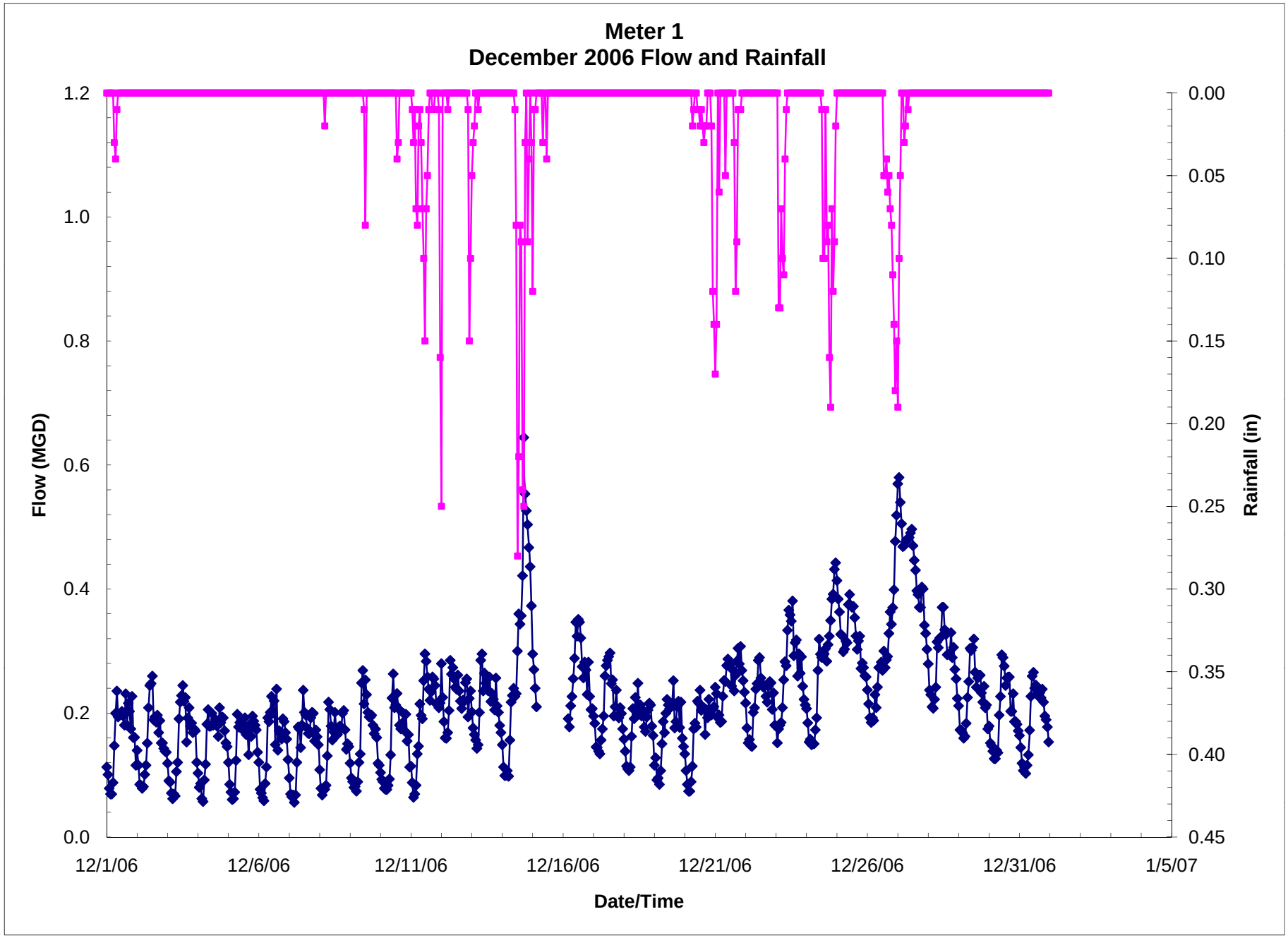
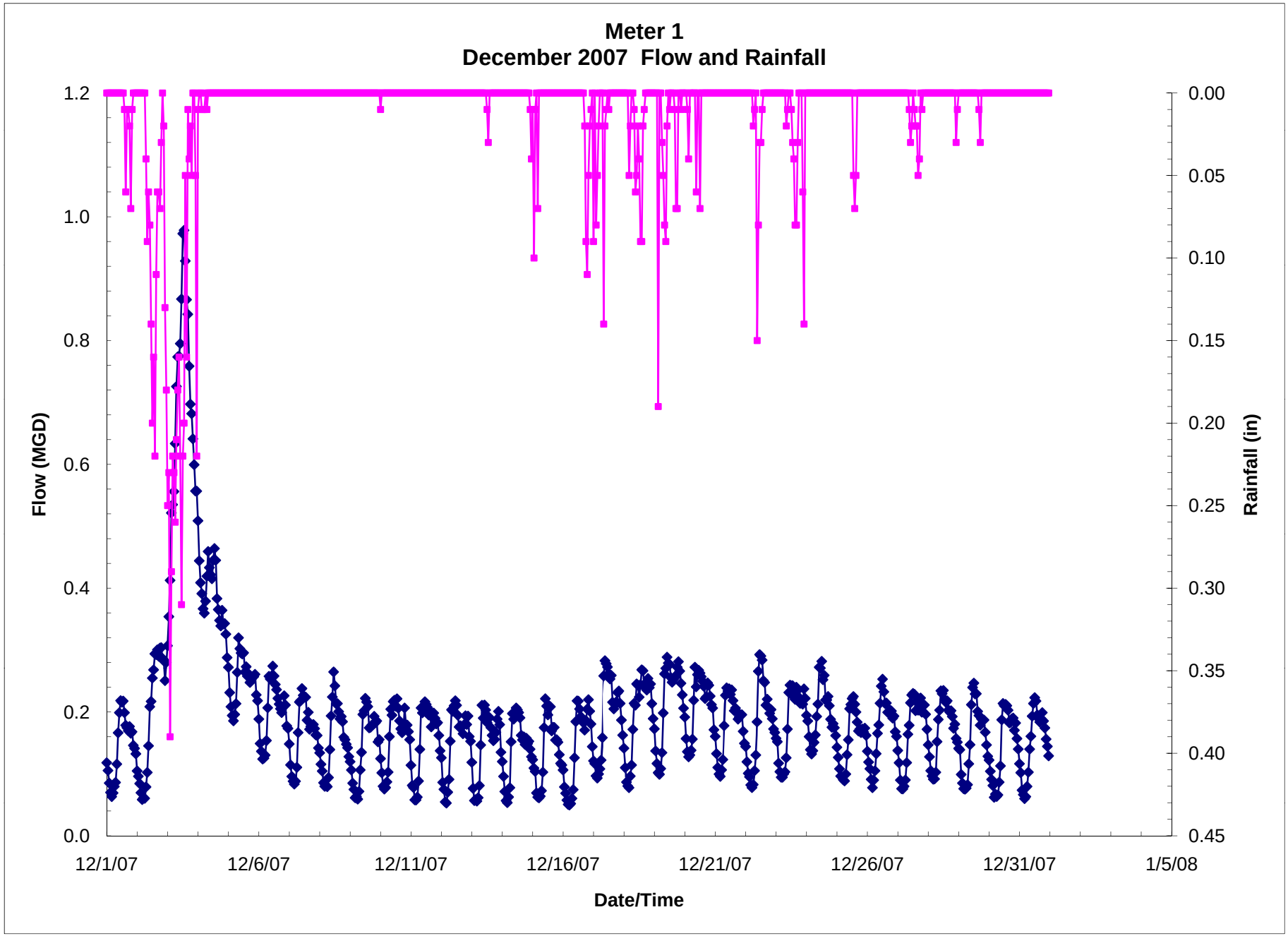
April 2008 Flow and Rainfall
Flow (MGD)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
Date/Time


Meter 1
December 2006 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07


Meter 1
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

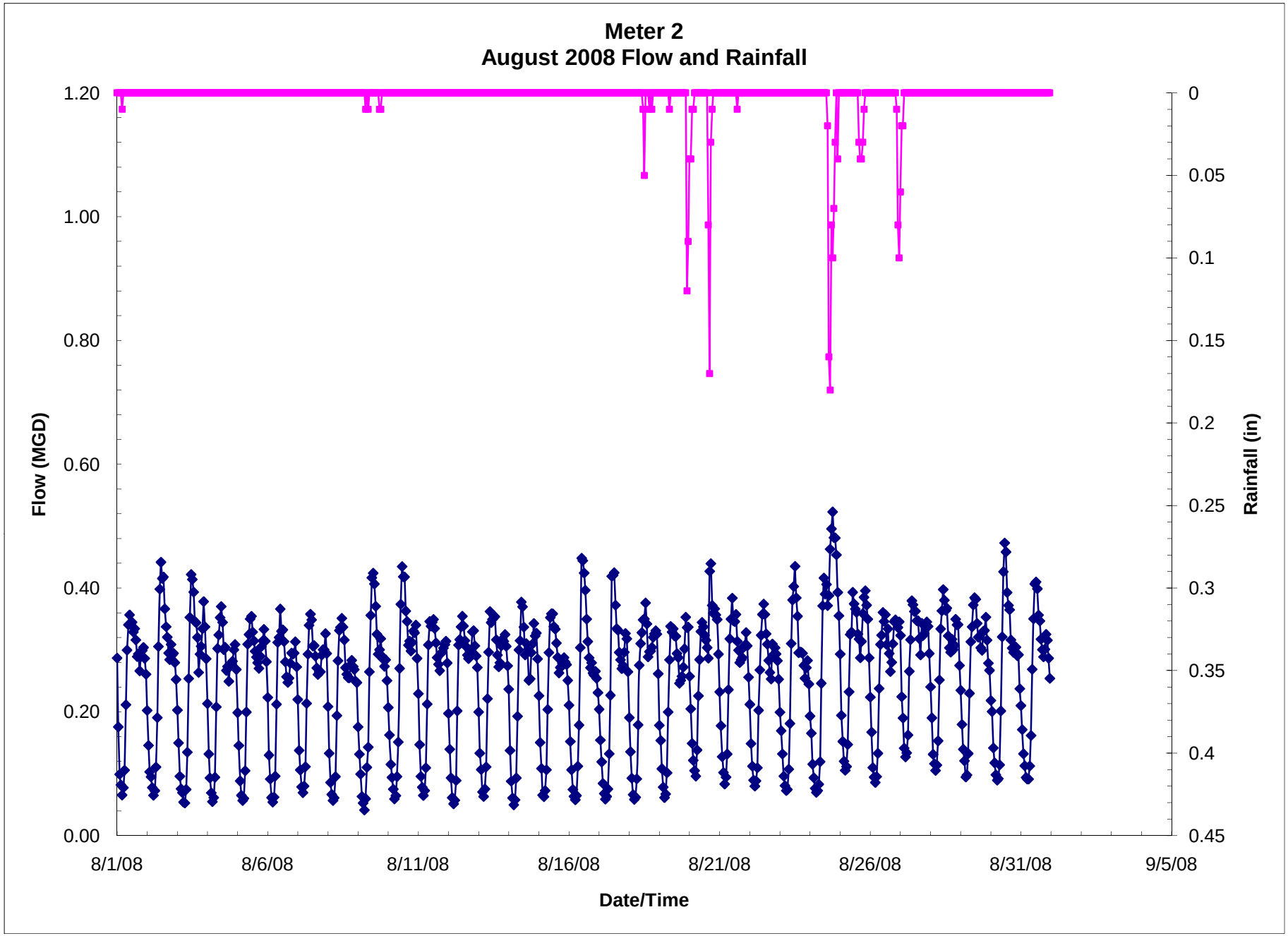
Meter 2

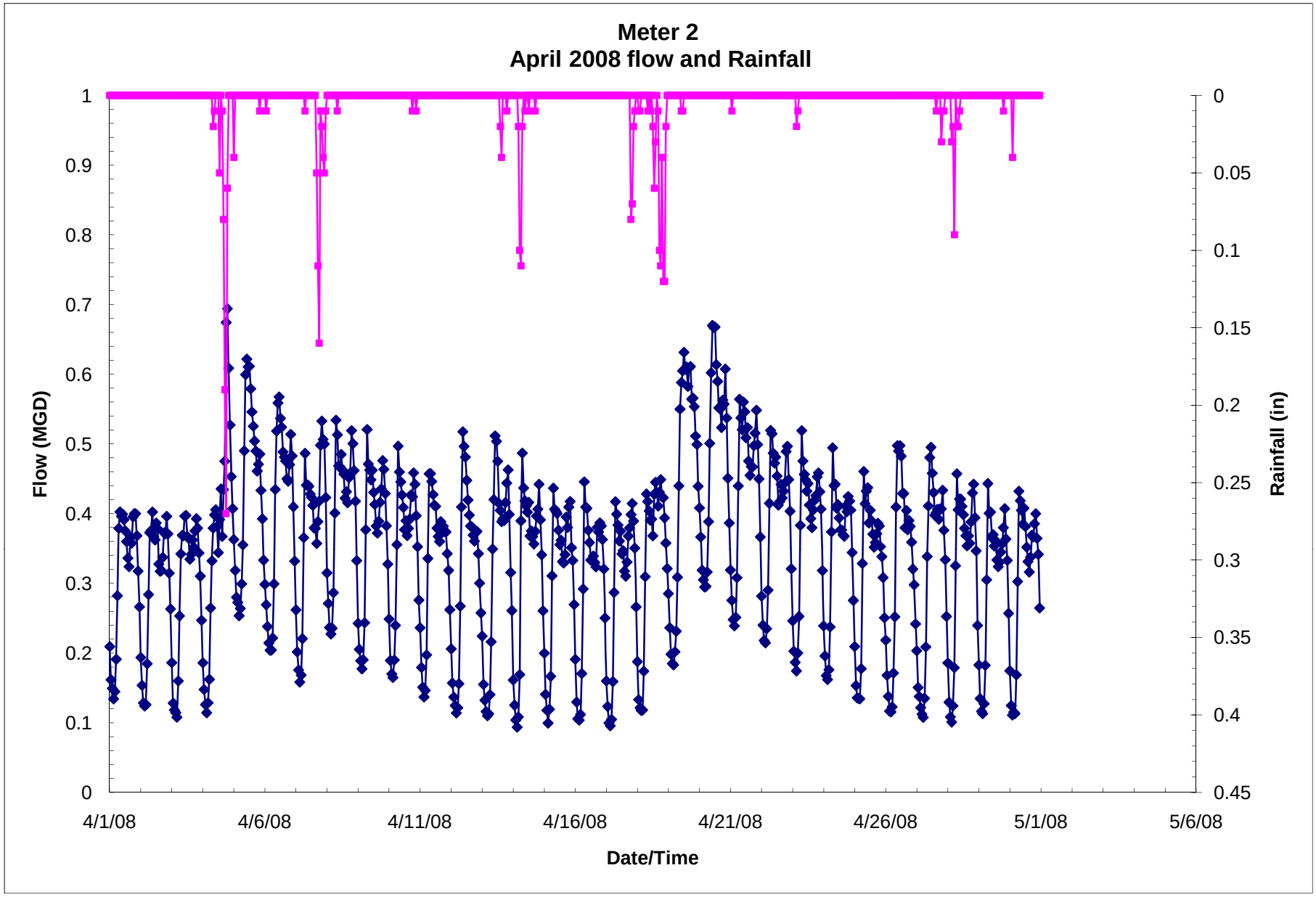
August 2008

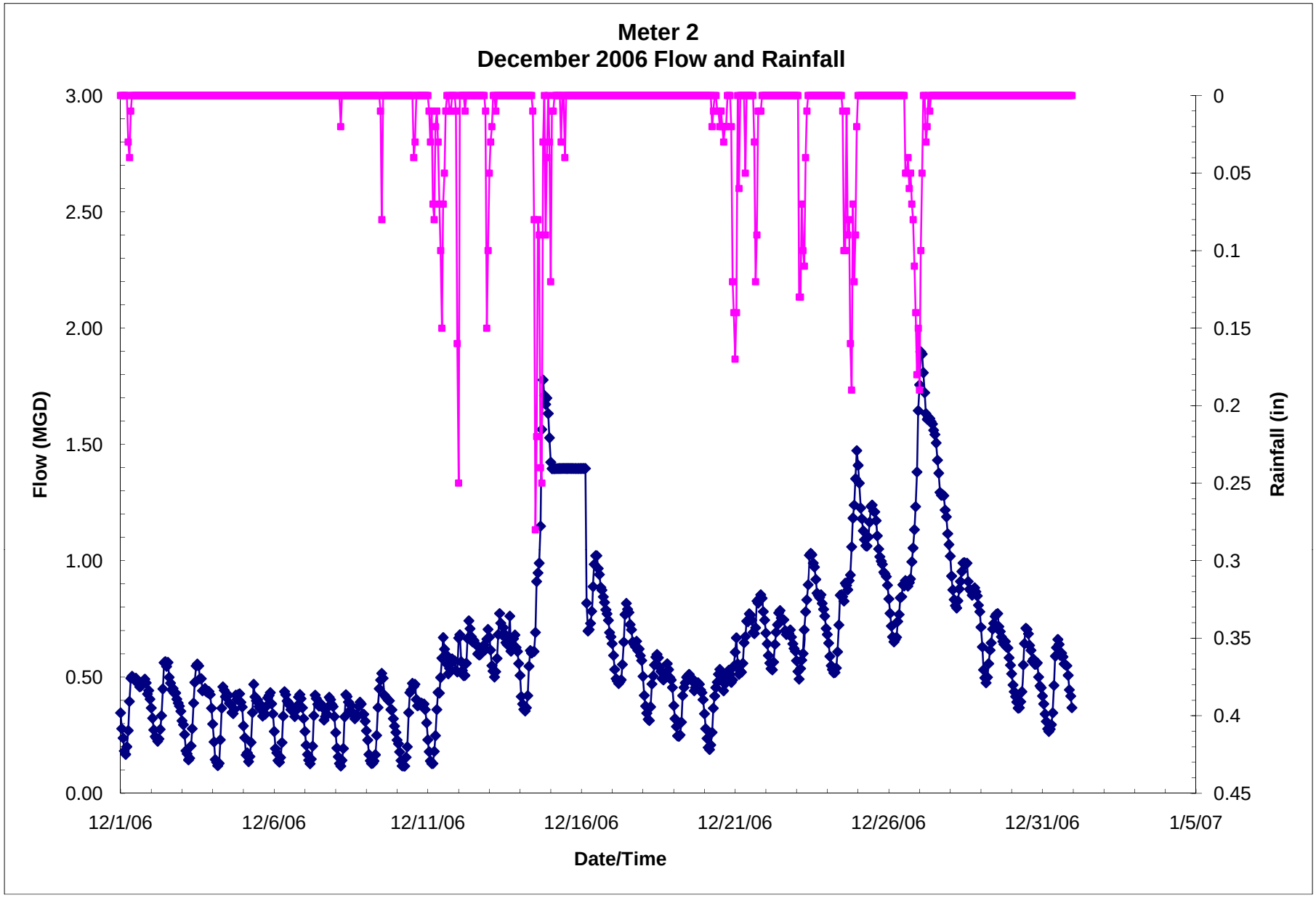
April 2008

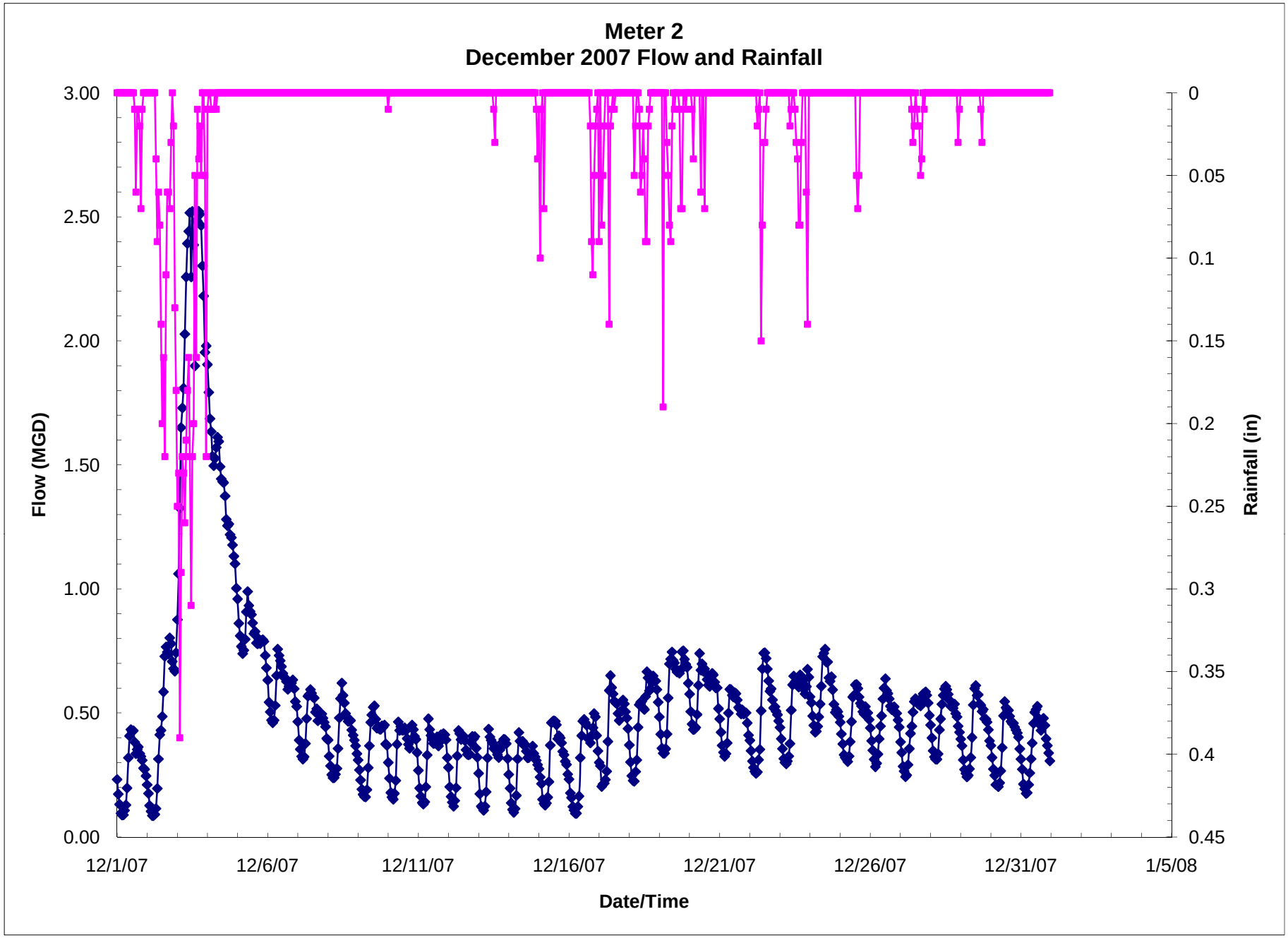
December 2006

December 2007


Meter 2
August 2008 Flow and Rainfall
Flow (MGD)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Rainfall (in)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
9/5/08
Date/Time


Meter 2
April 2008 flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Meter 2
December 2006 Flow and Rainfall
Flow (MGD)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Rainfall (in)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07
Date/Time


Meter 2
December 2007 Flow and Rainfall
Flow (MGD)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Rainfall (in)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08
Date/Time

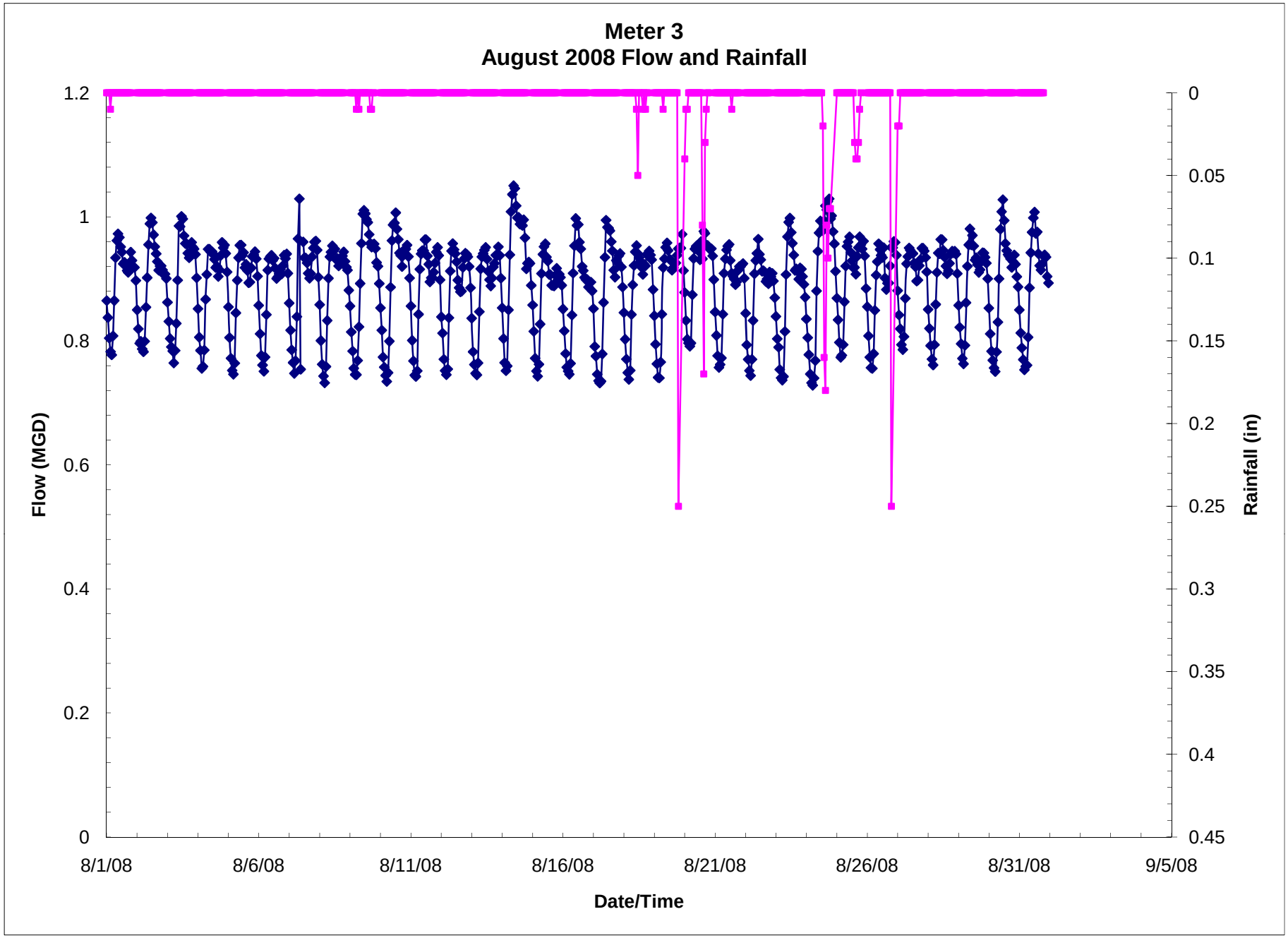
Meter 3

August 2008

April 2008

December 2006

December 2007


Meter 3
August 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1.2
1
0.8
0.6
0.4
0.2
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
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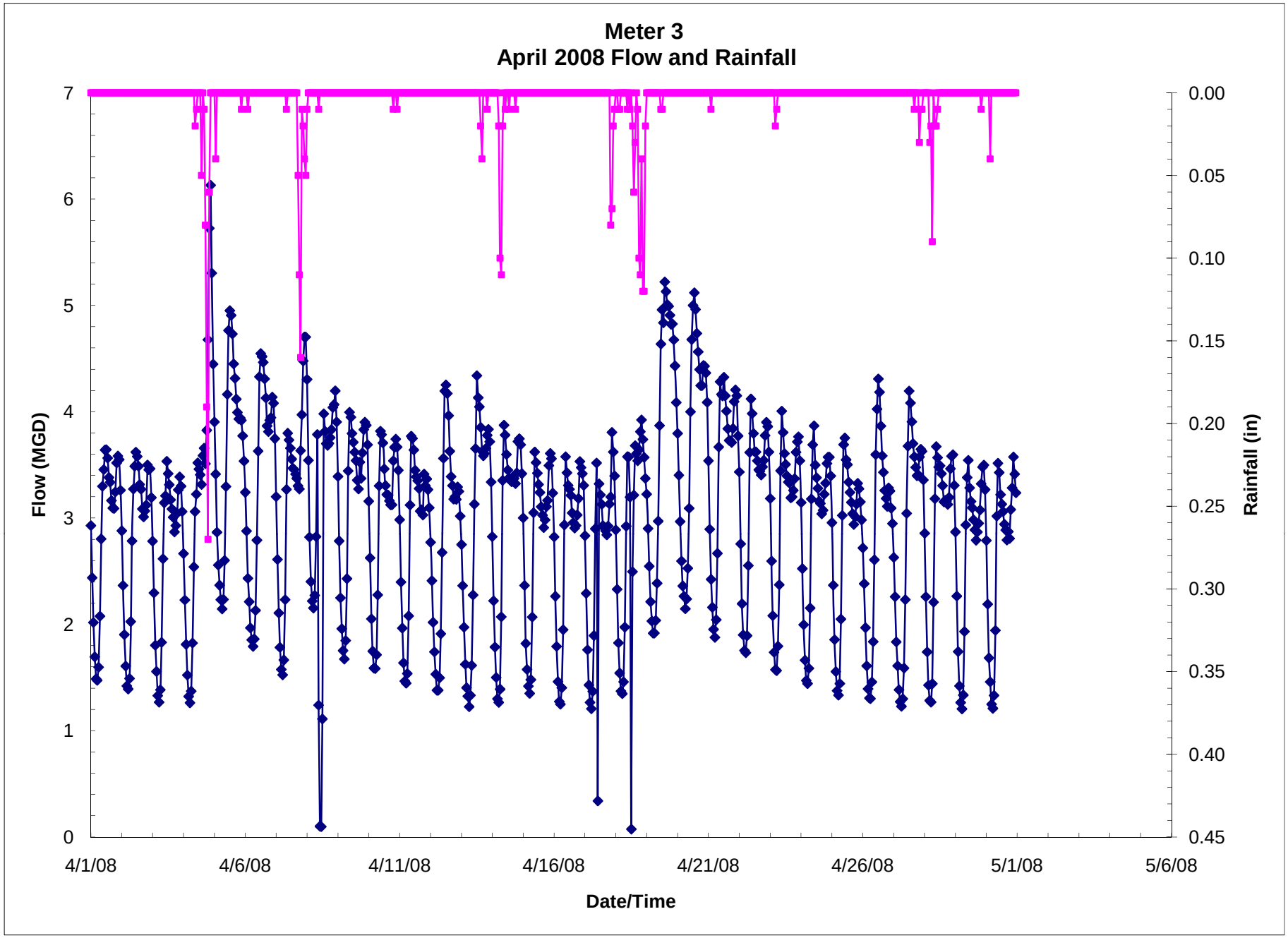
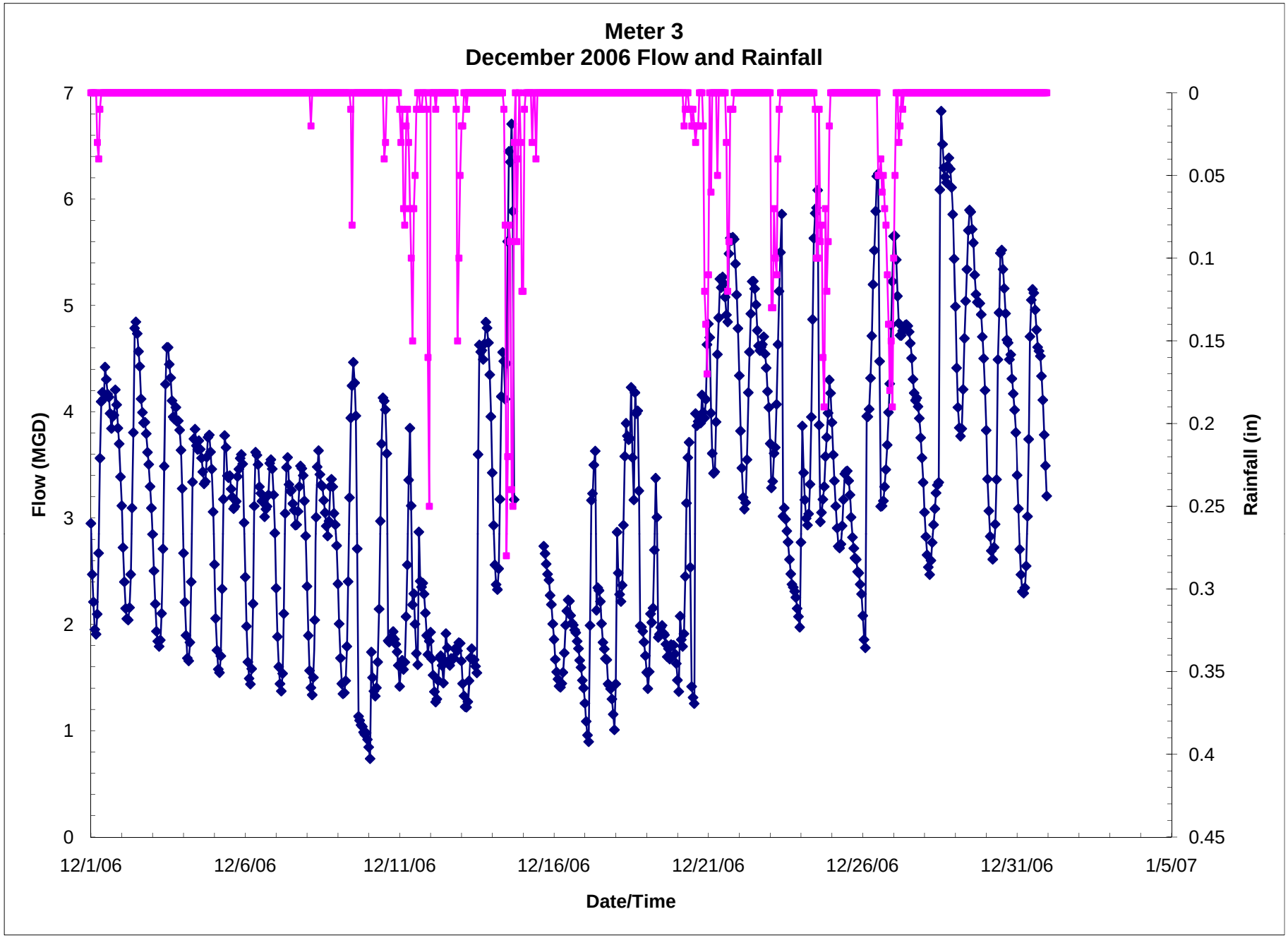
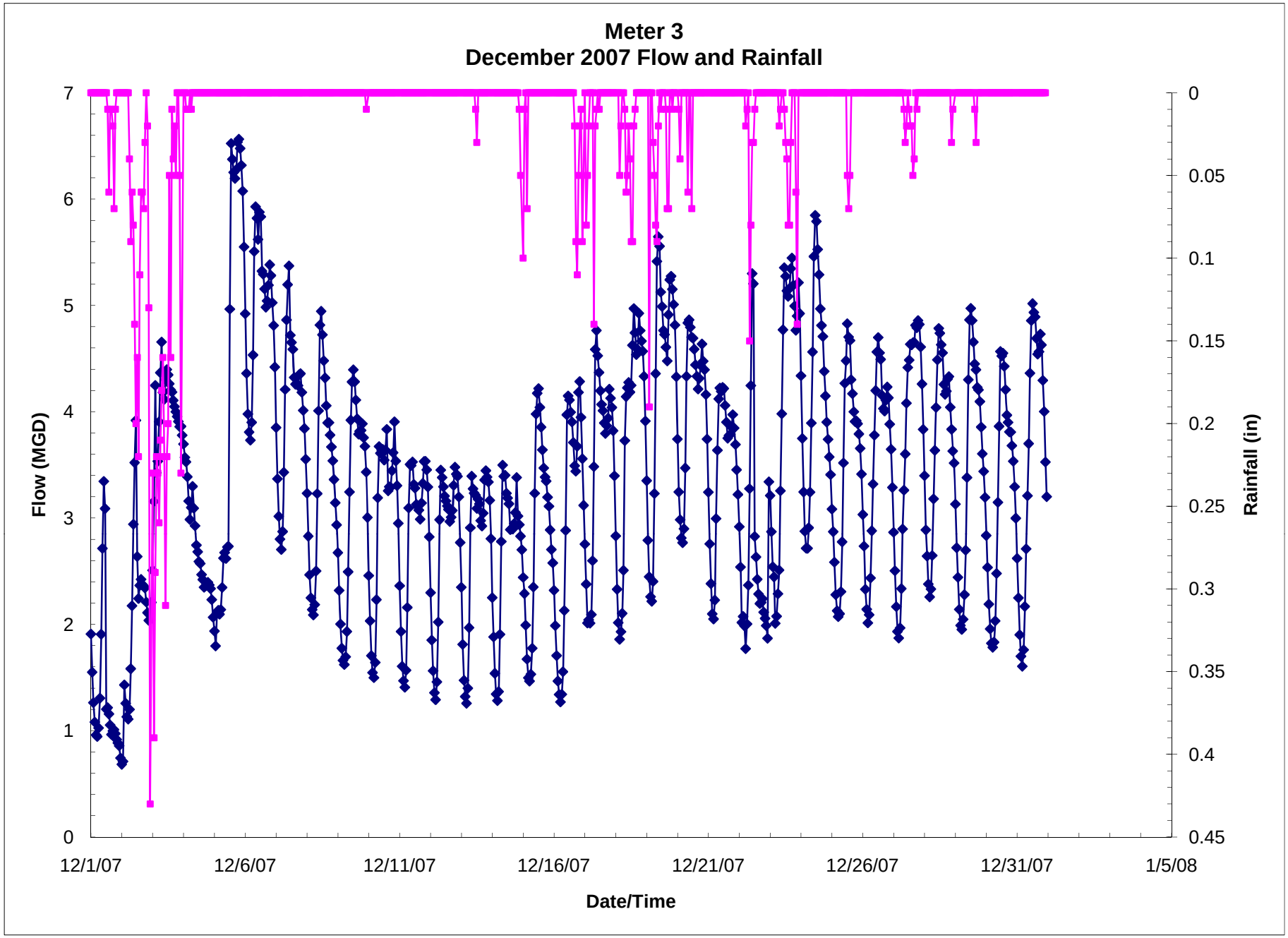
8/31/08
9/5/08


Meter 3
April 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
0
1
2
3
4
5
6
7
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Meter 3
December 2006 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
0
1
2
3
4
5
6
7
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07


Meter 3
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
0
1
2
3
4
5
6
7
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

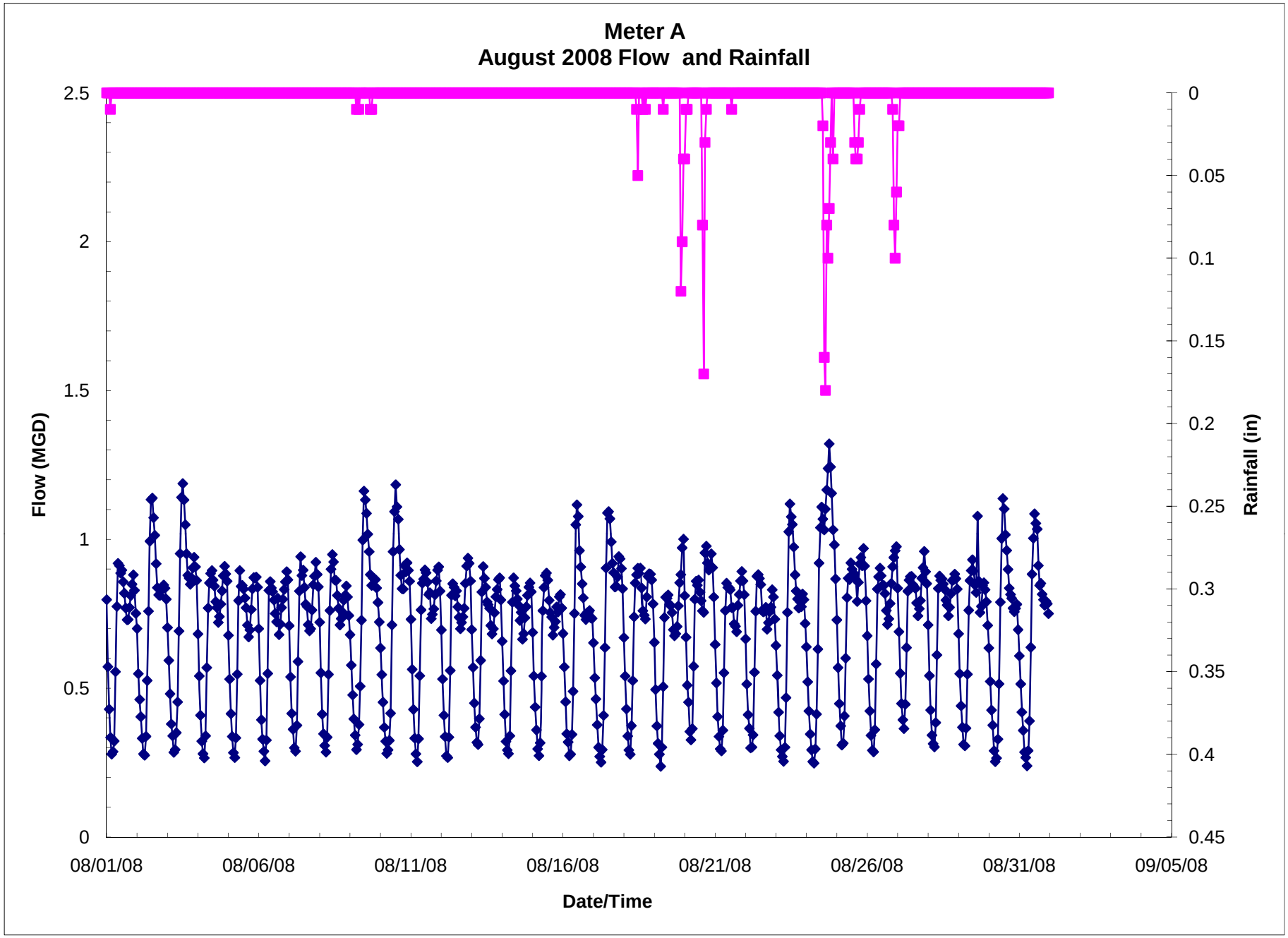
Meter A

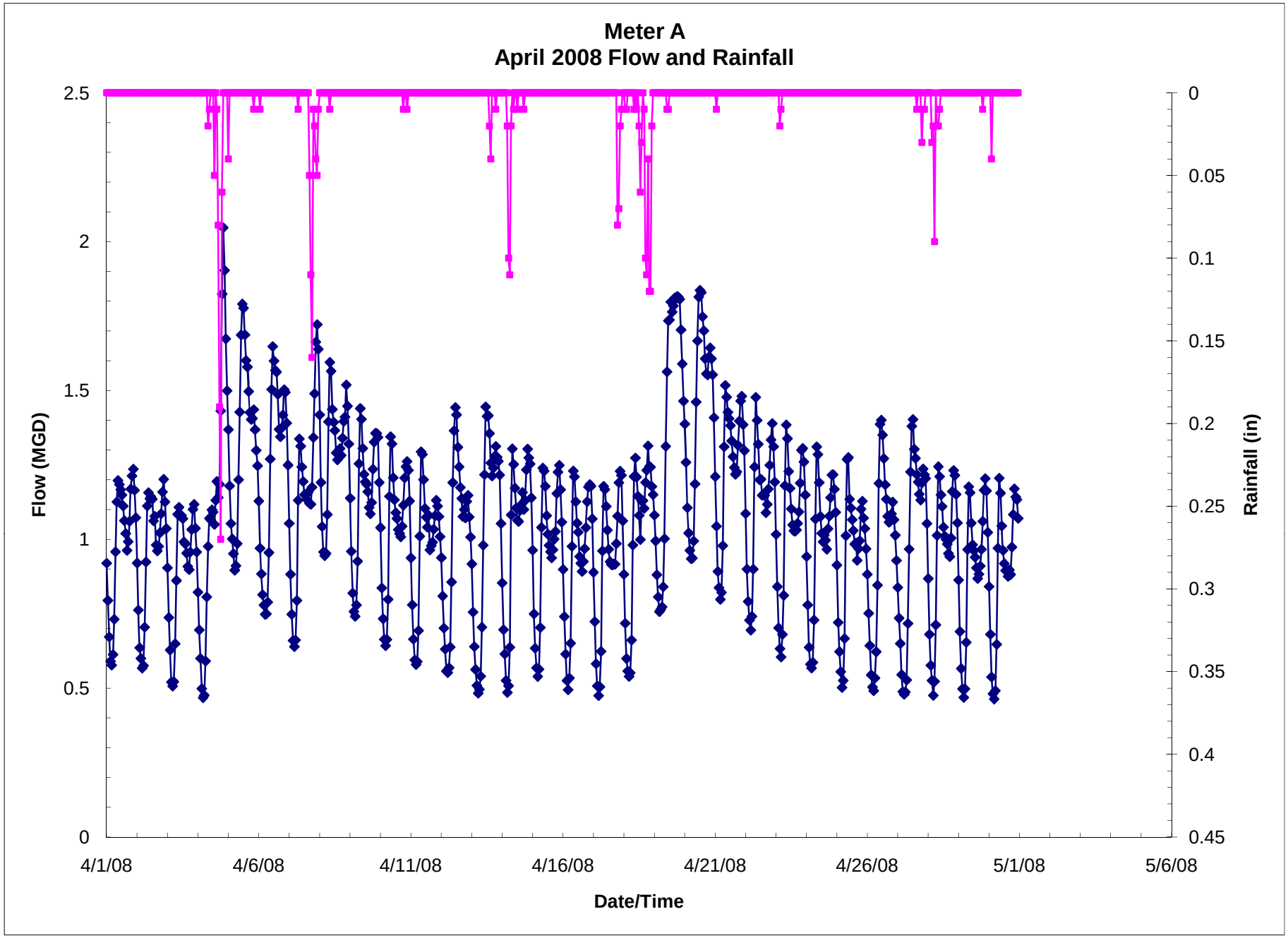
August 2008

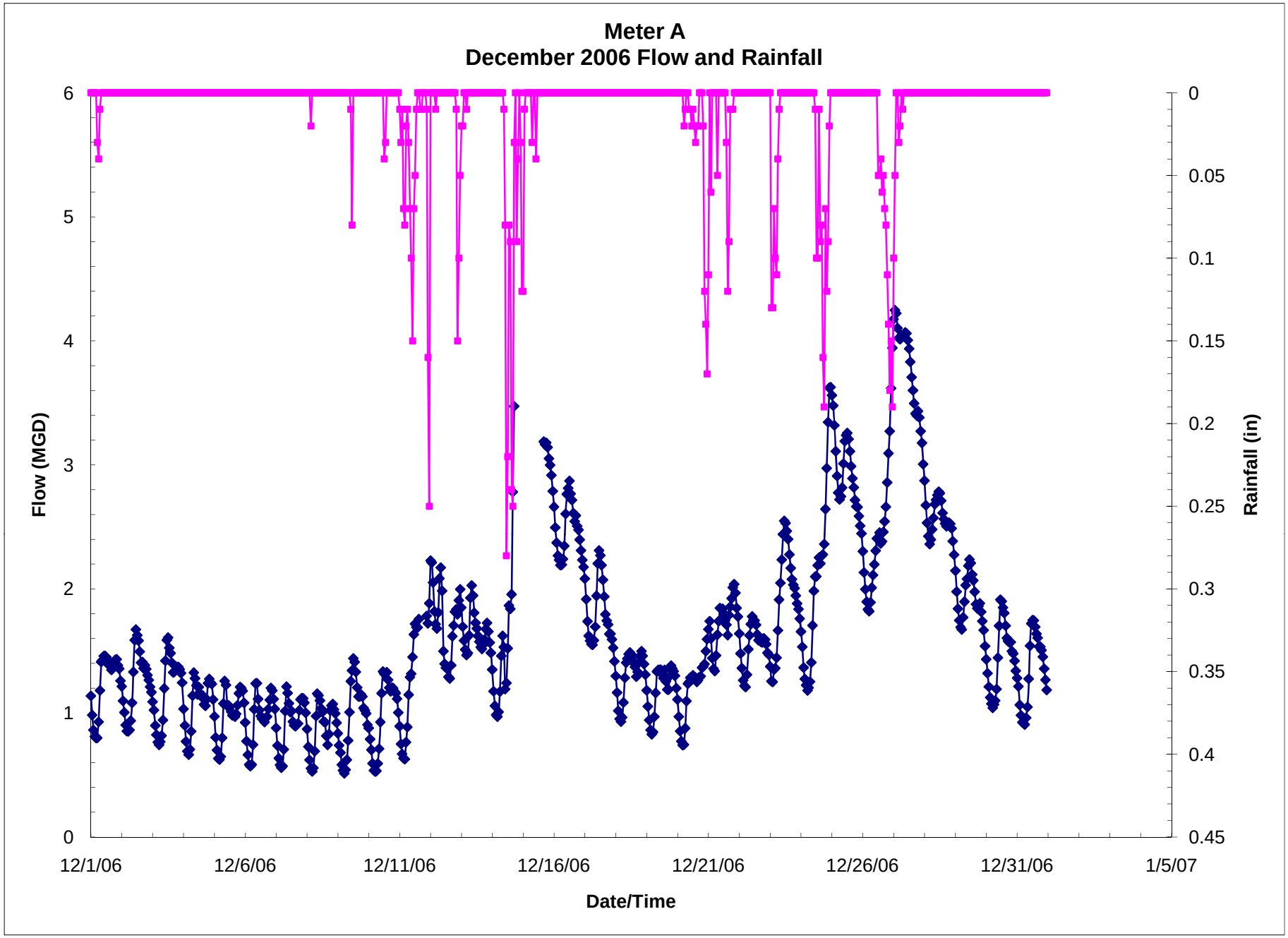
April 2008

December 2006

December 2007


Meter A
August 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
08/01/08
08/06/08
08/11/08
08/16/08
08/21/08
08/26/08
08/31/08
09/05/08


Meter A
April 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Meter A
December 2006 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
0
1
2
3
4
5
6
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
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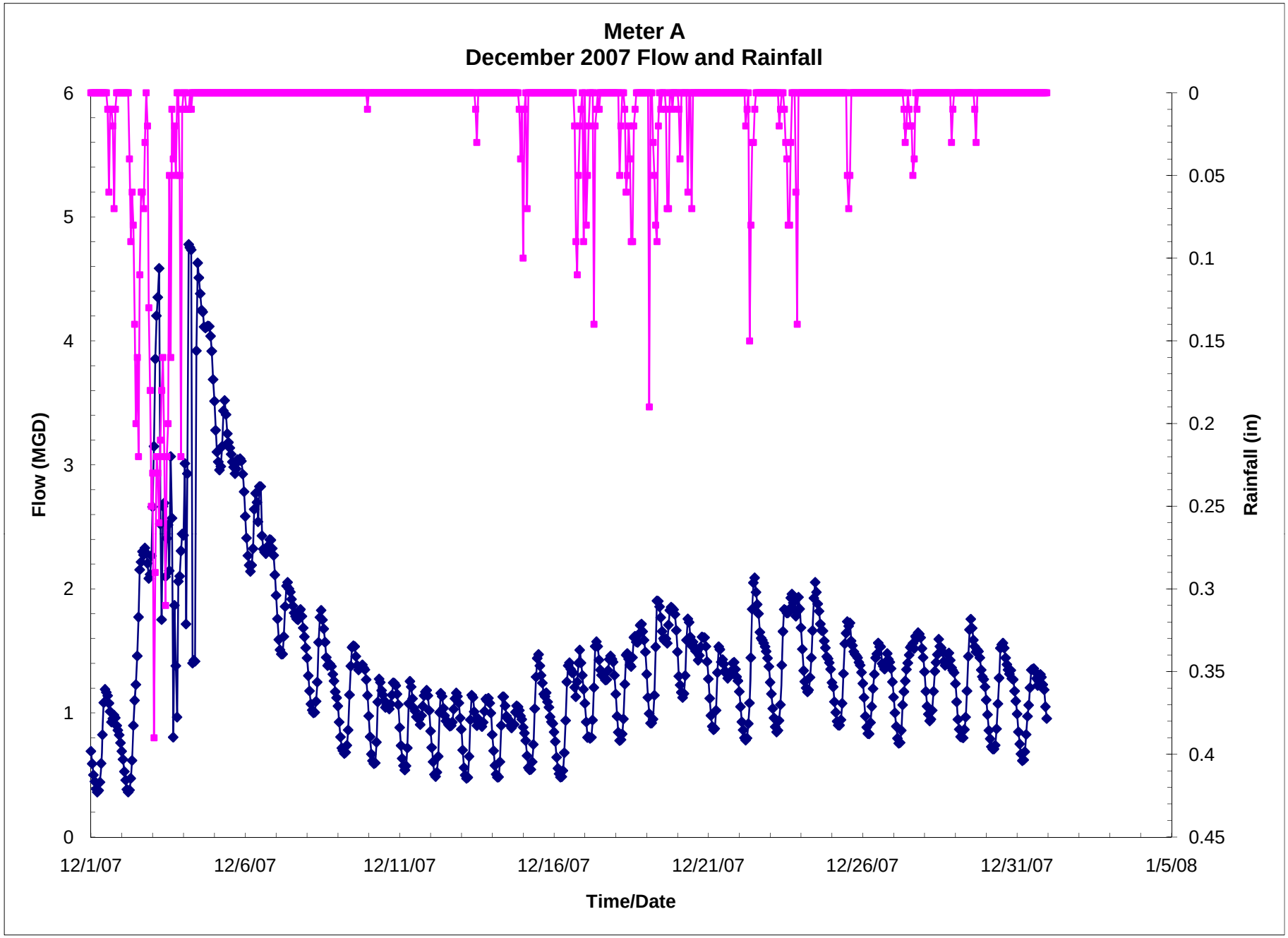
12/31/06
1/5/07


Meter A
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Time/Date
0
1
2
3
4
5
6
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

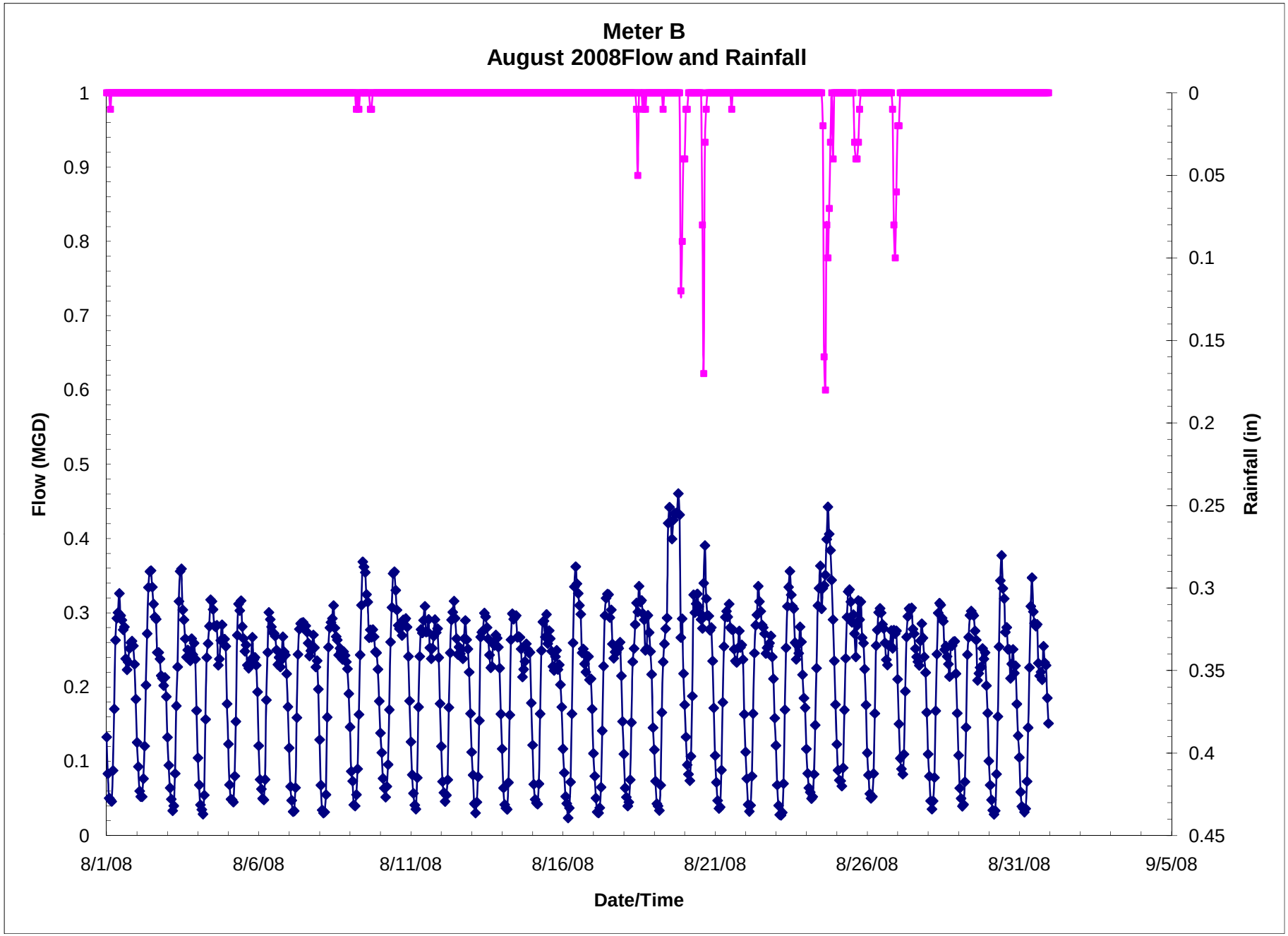
Meter B

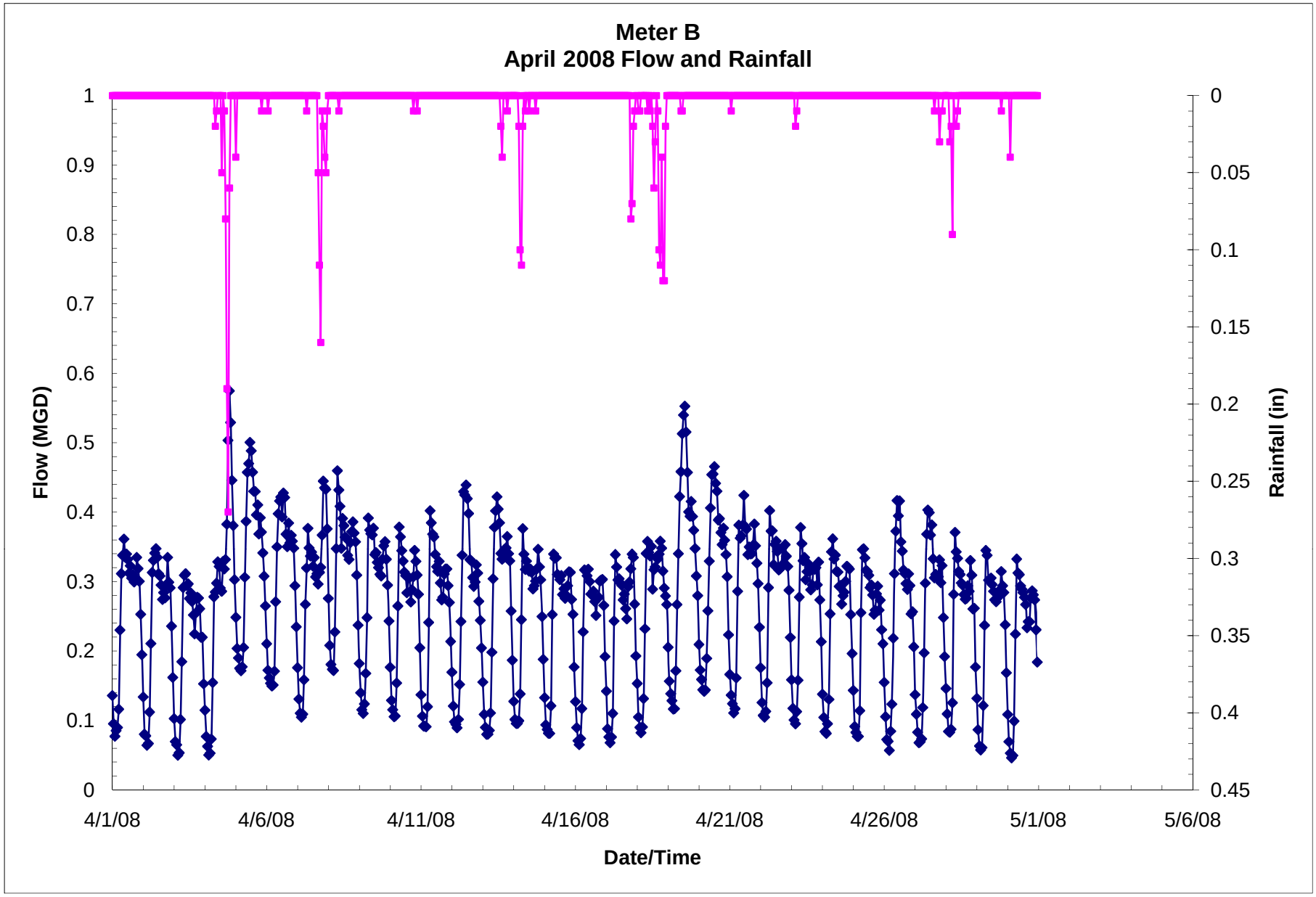
August 2008

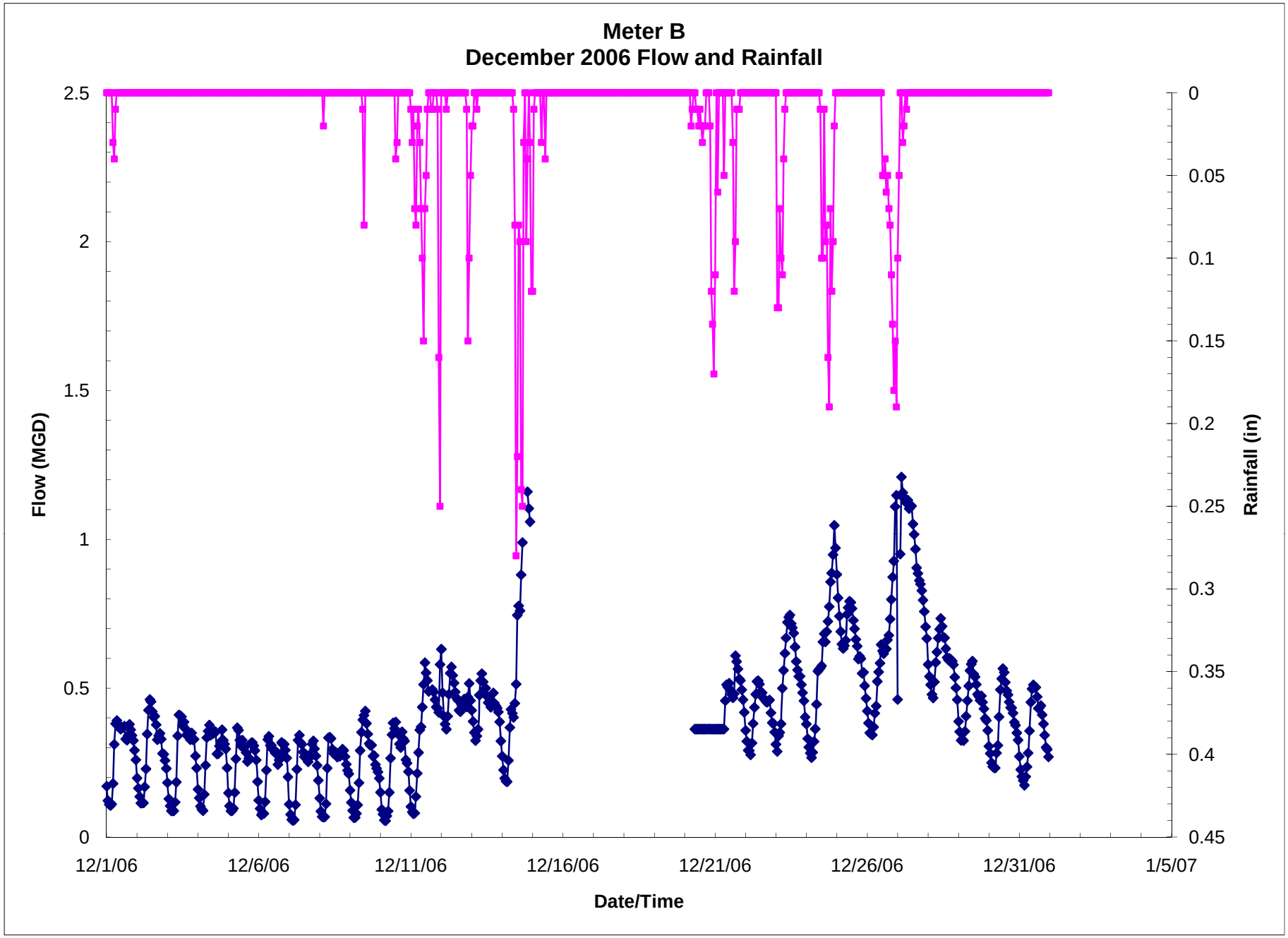
April 2008

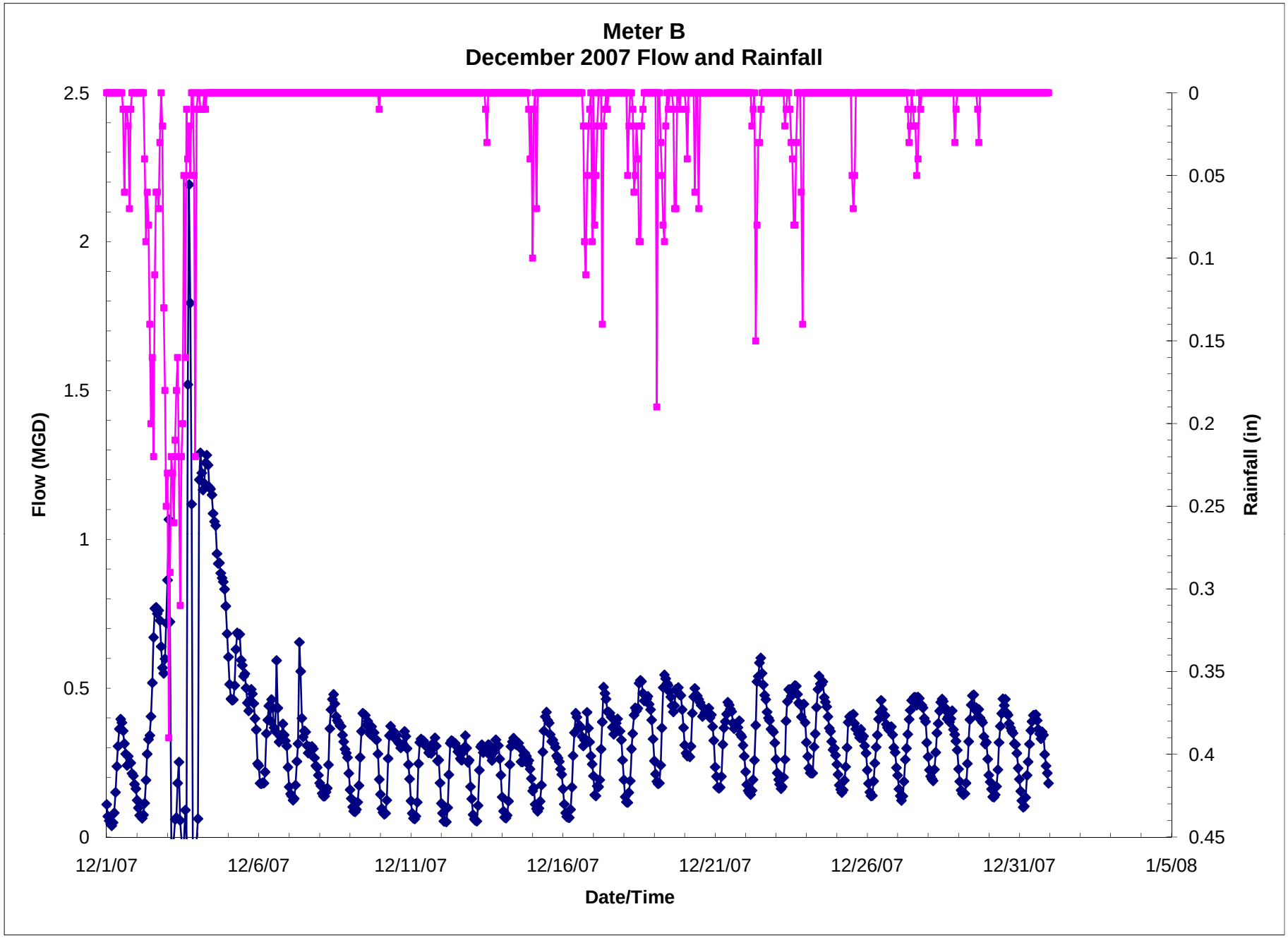
December 2006

December 2007


Meter B
August 2008Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
9/5/08


Meter B
April 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Meter B
December 2006 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07


Meter B
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

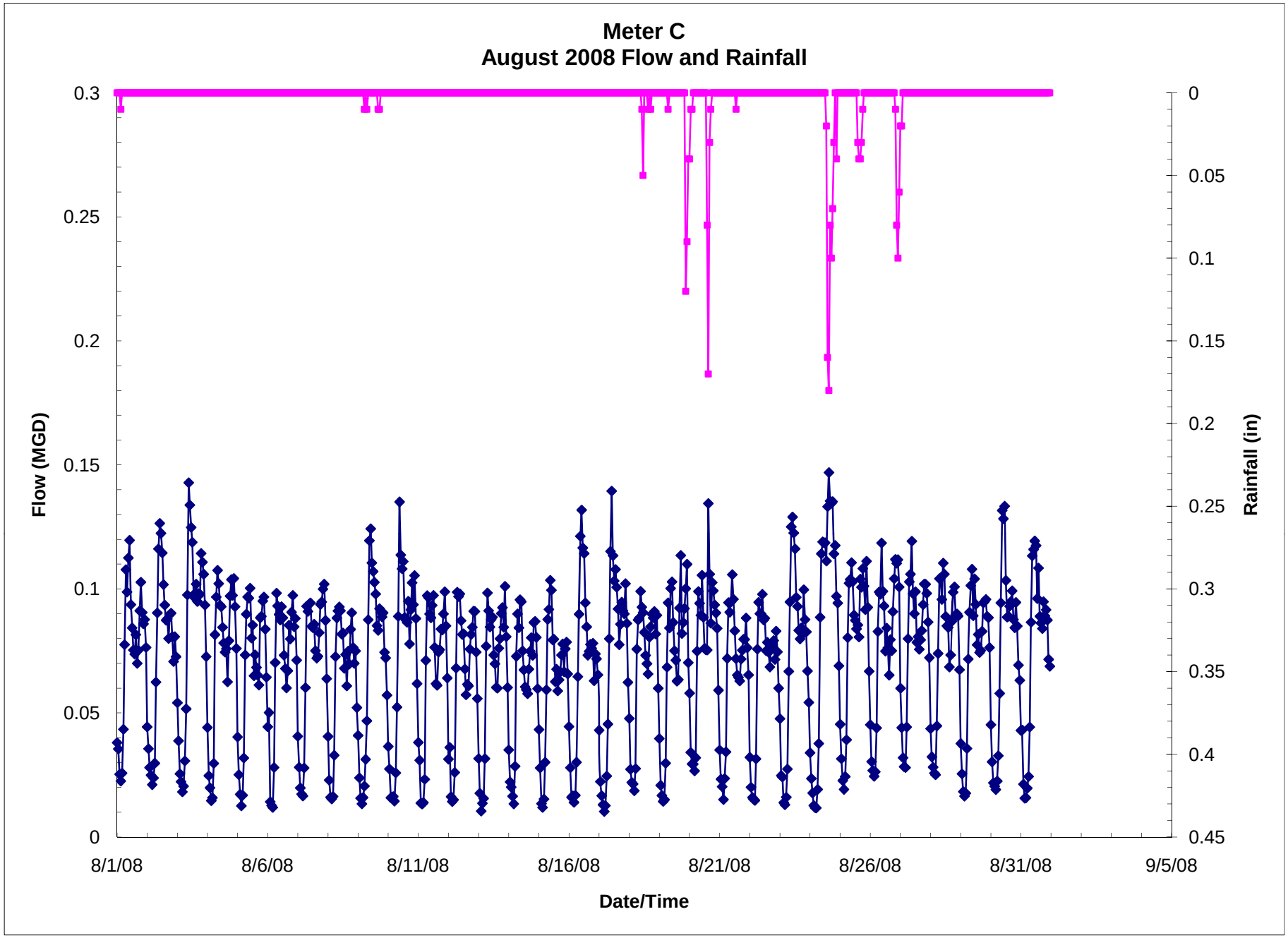
Meter C

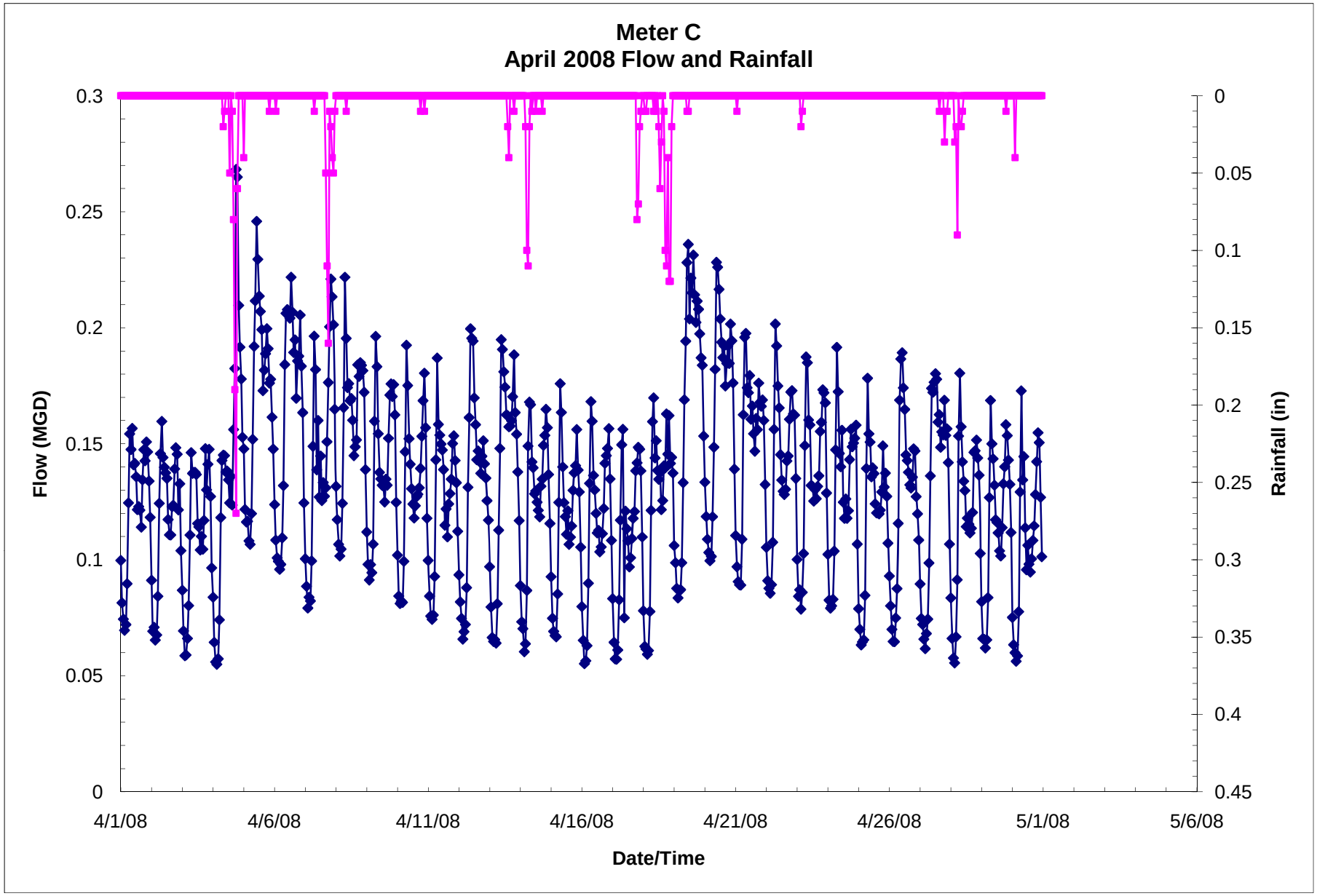
August 2008

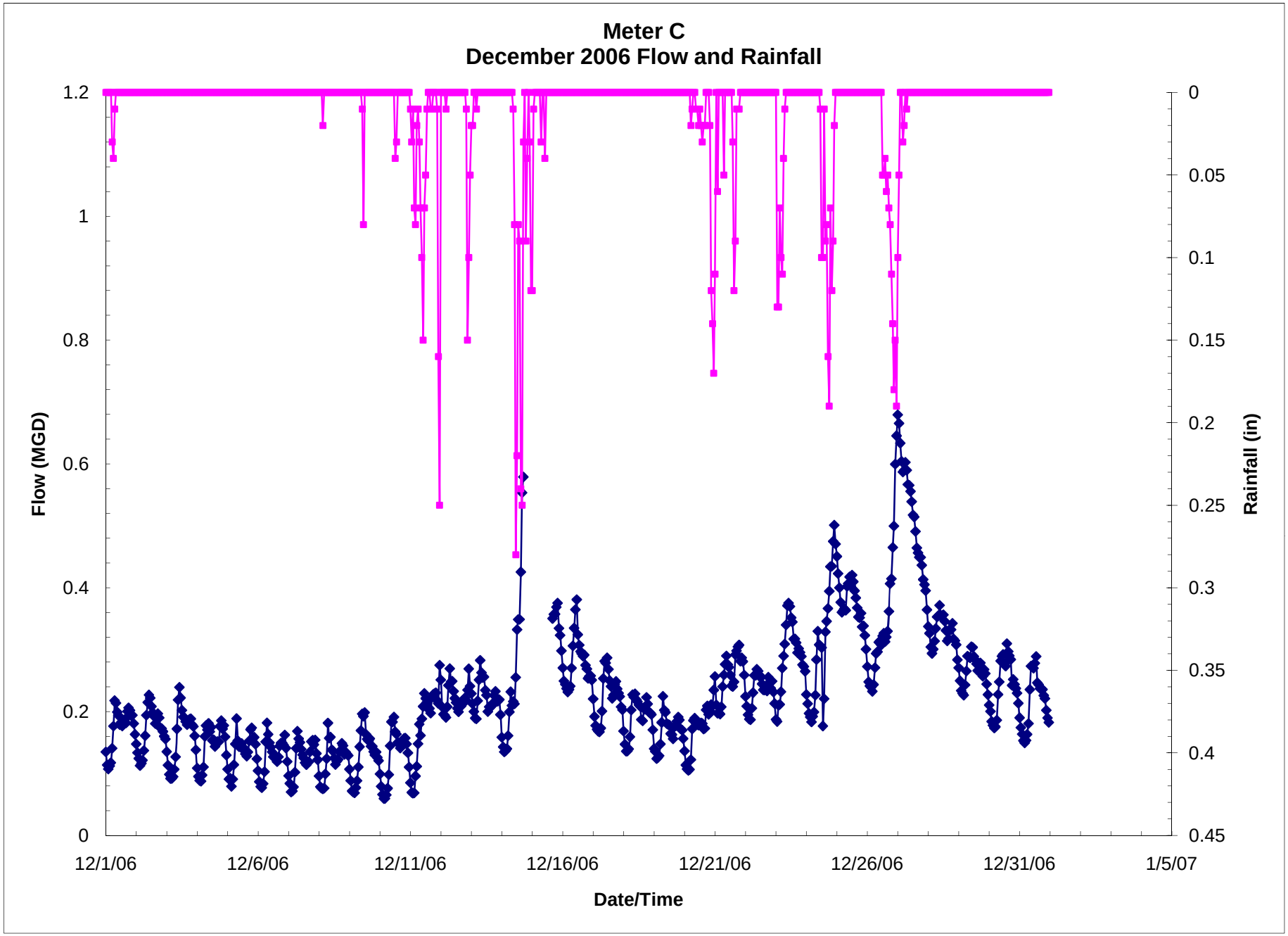
April 2008

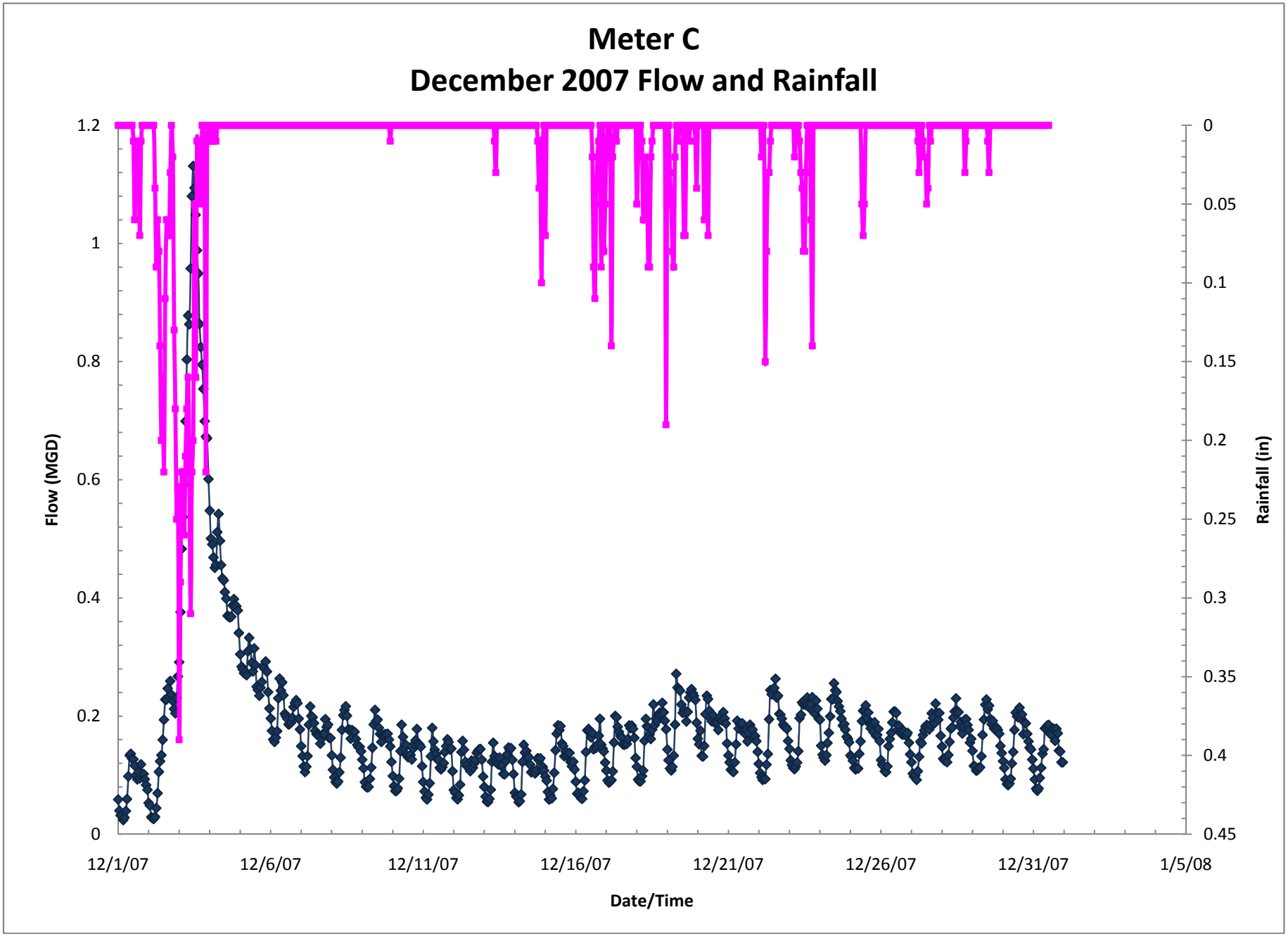
December 2006

December 2007


Meter C
August 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
9/5/08


Meter C
April 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Meter C
December 2006 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1.2
1
0.8
0.6
0.4
0.2
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07


Meter C
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1.2
1
0.8
0.6
0.4
0.2
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

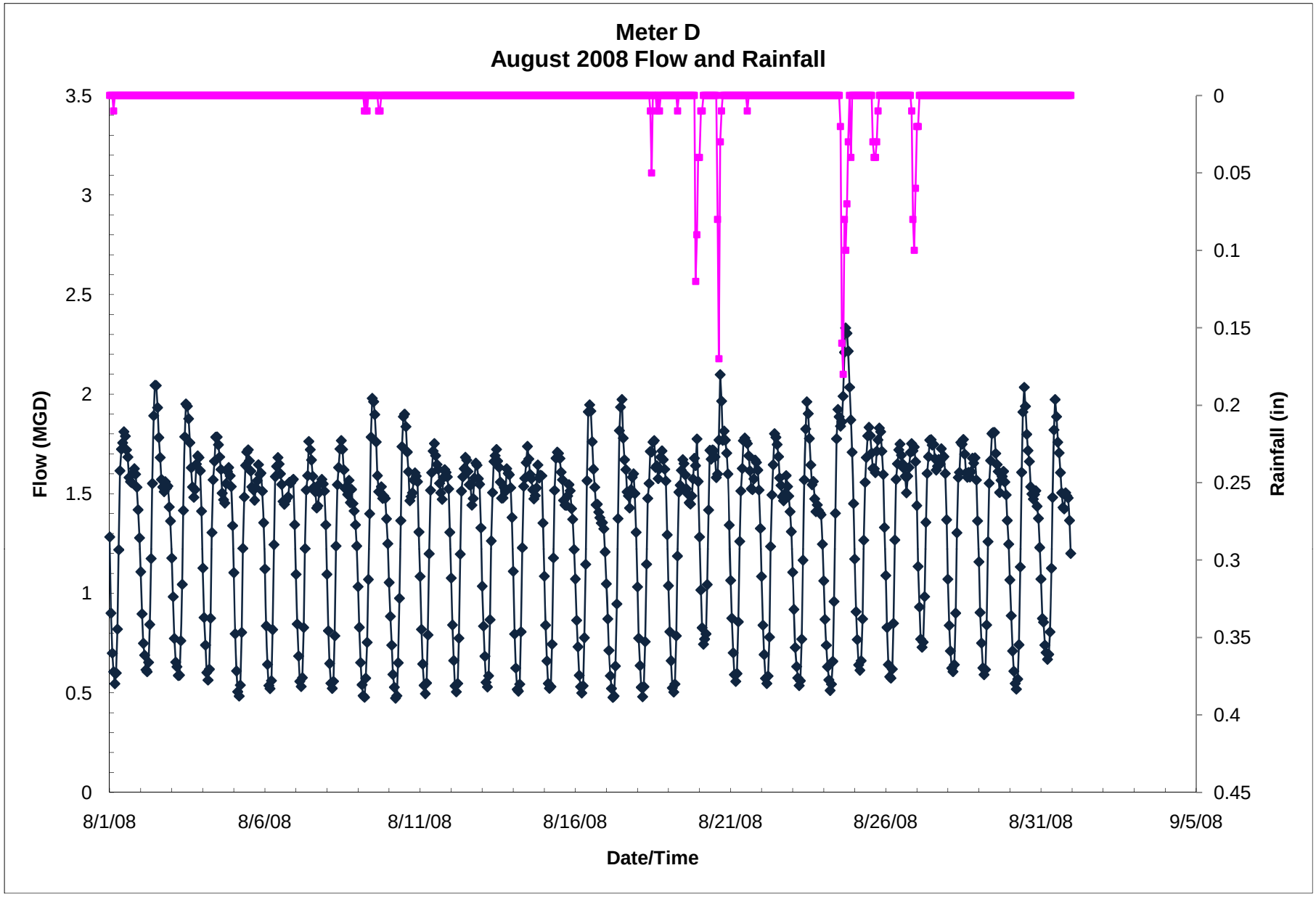
Meter D

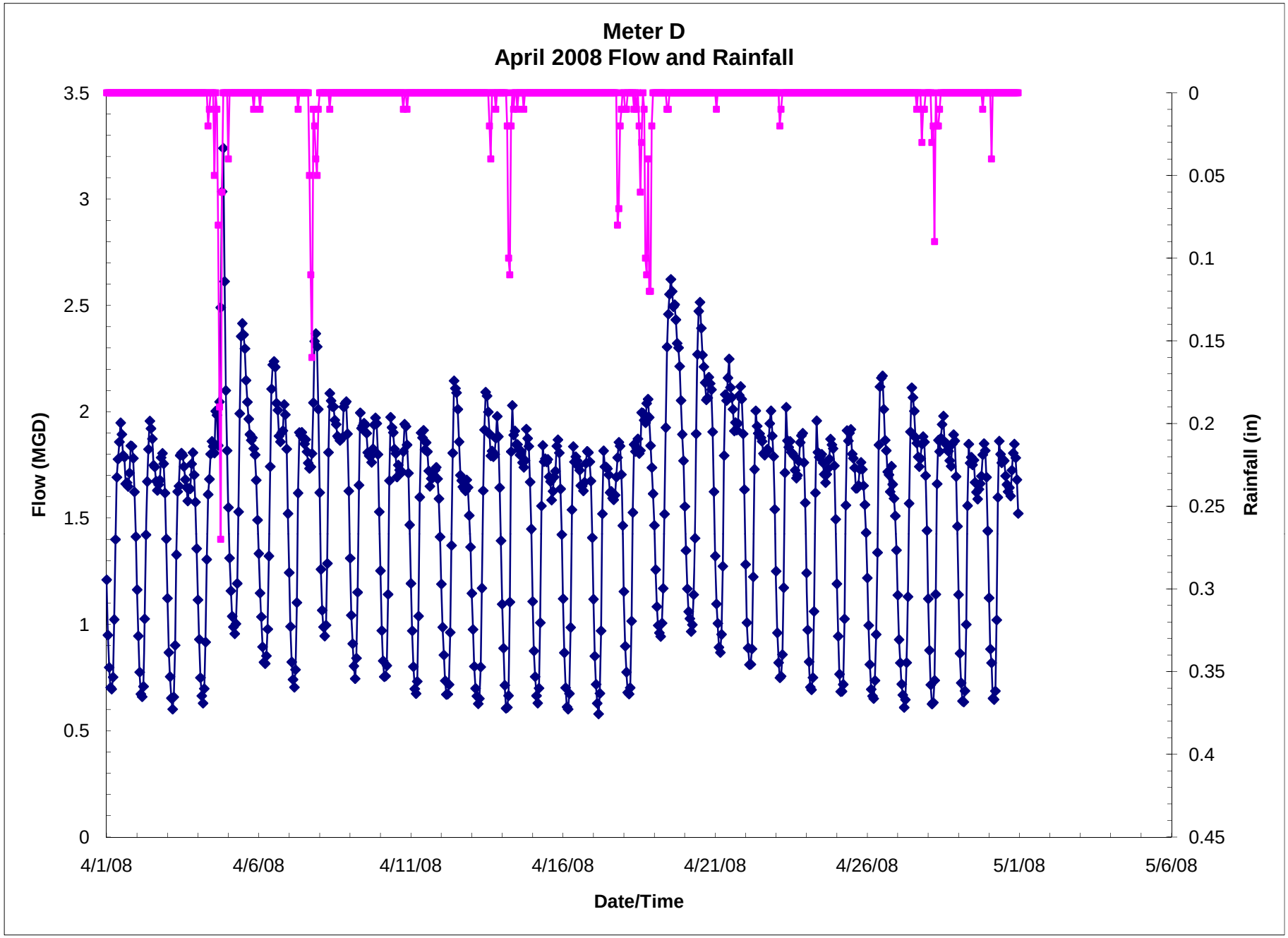
August 2008

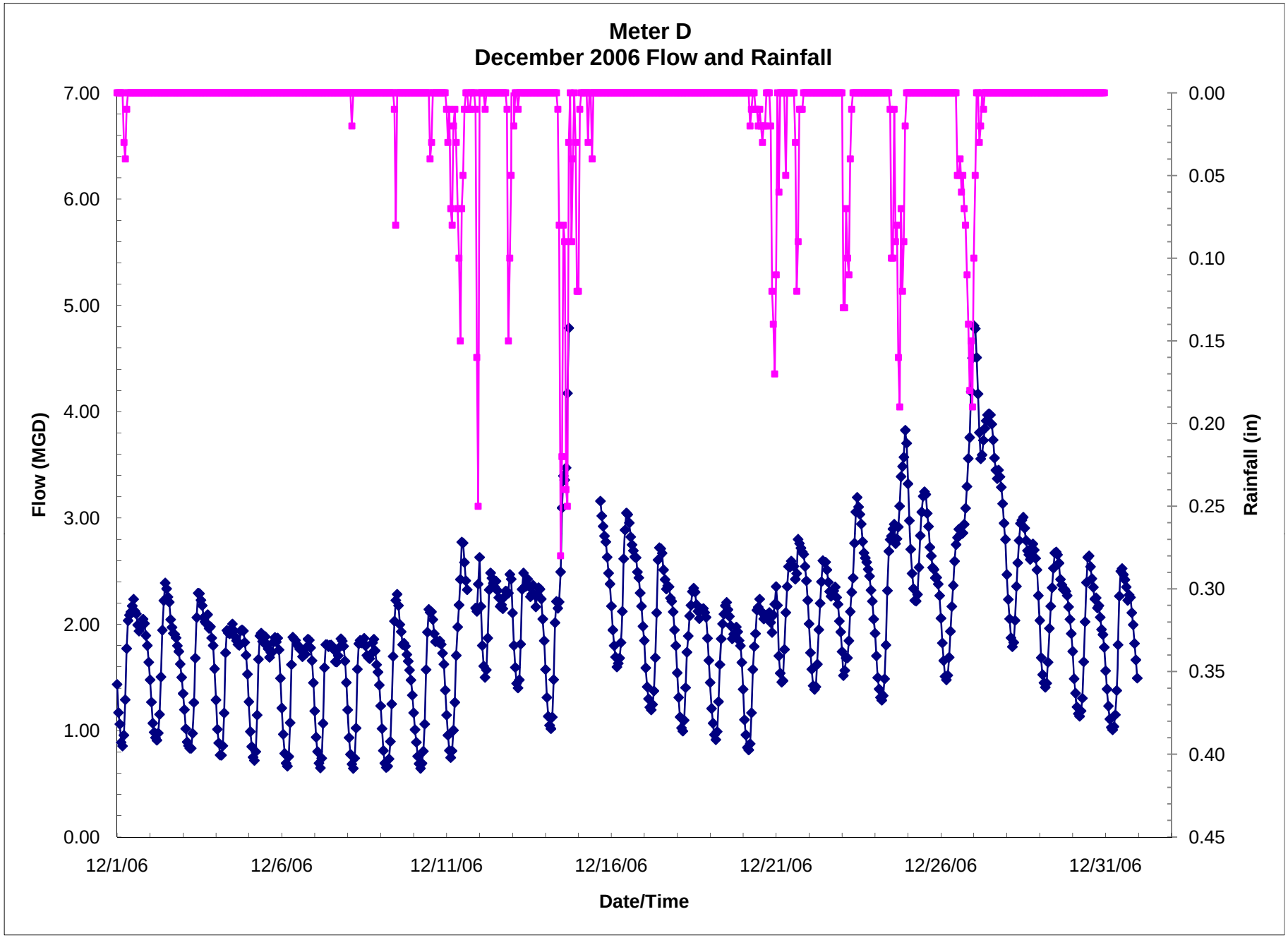
April 2008

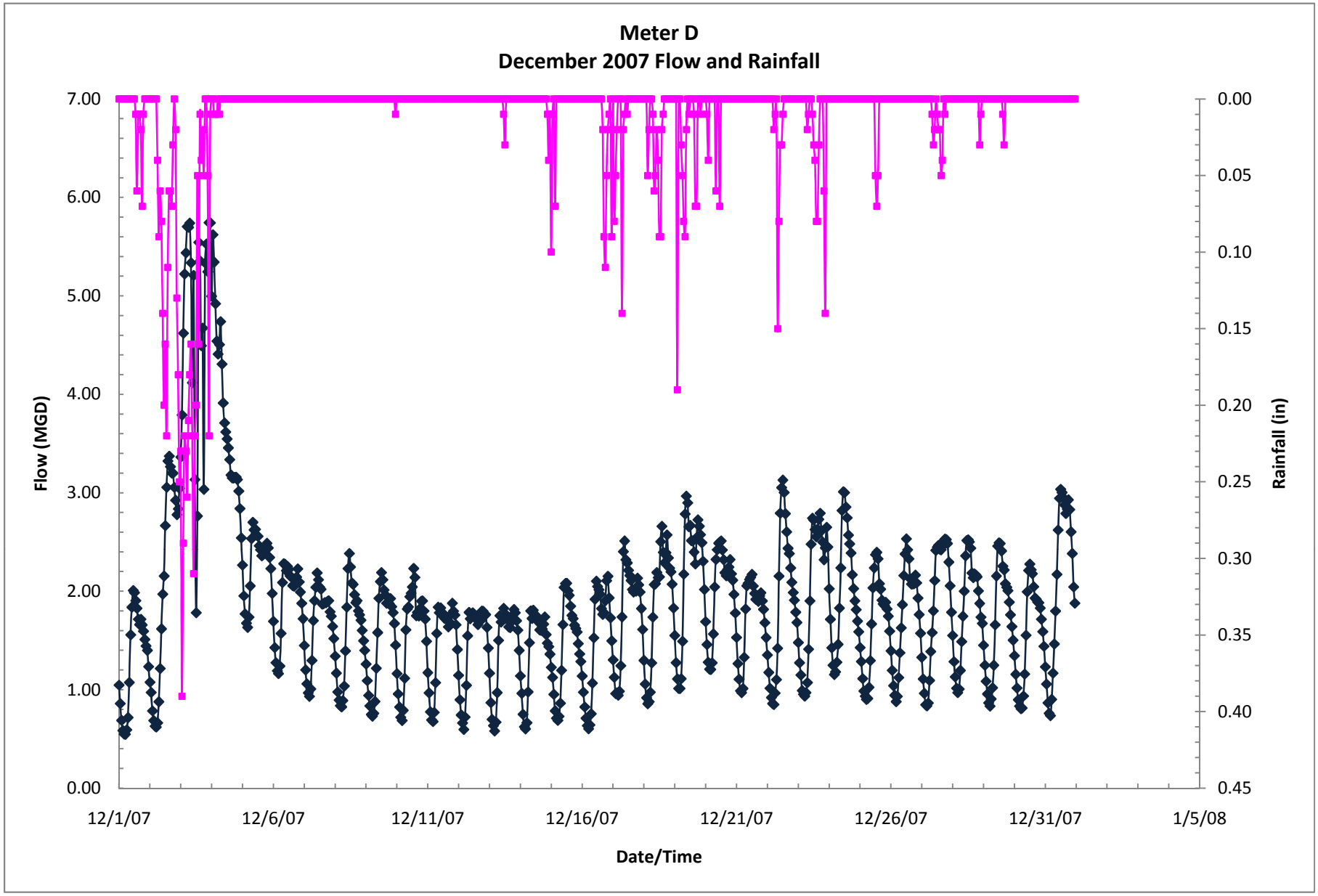
December 2006

December 2007


Meter D
August 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
3.5
3
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
9/5/08


Meter D
April 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
3.5
3
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Meter D
December 2006 Flow and Rainfall
Flow (MGD)
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
Date/Time


Meter D
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

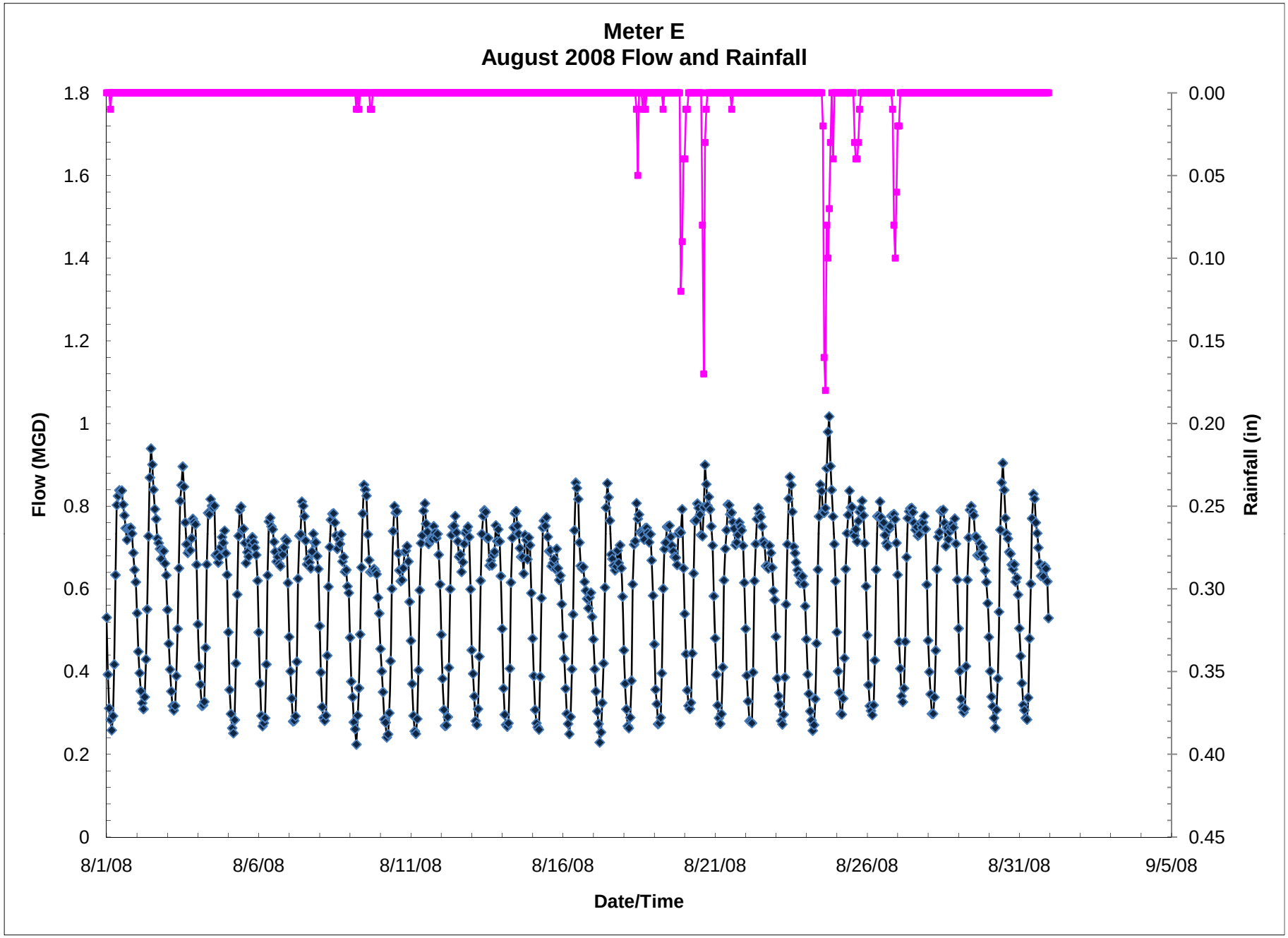
Meter E

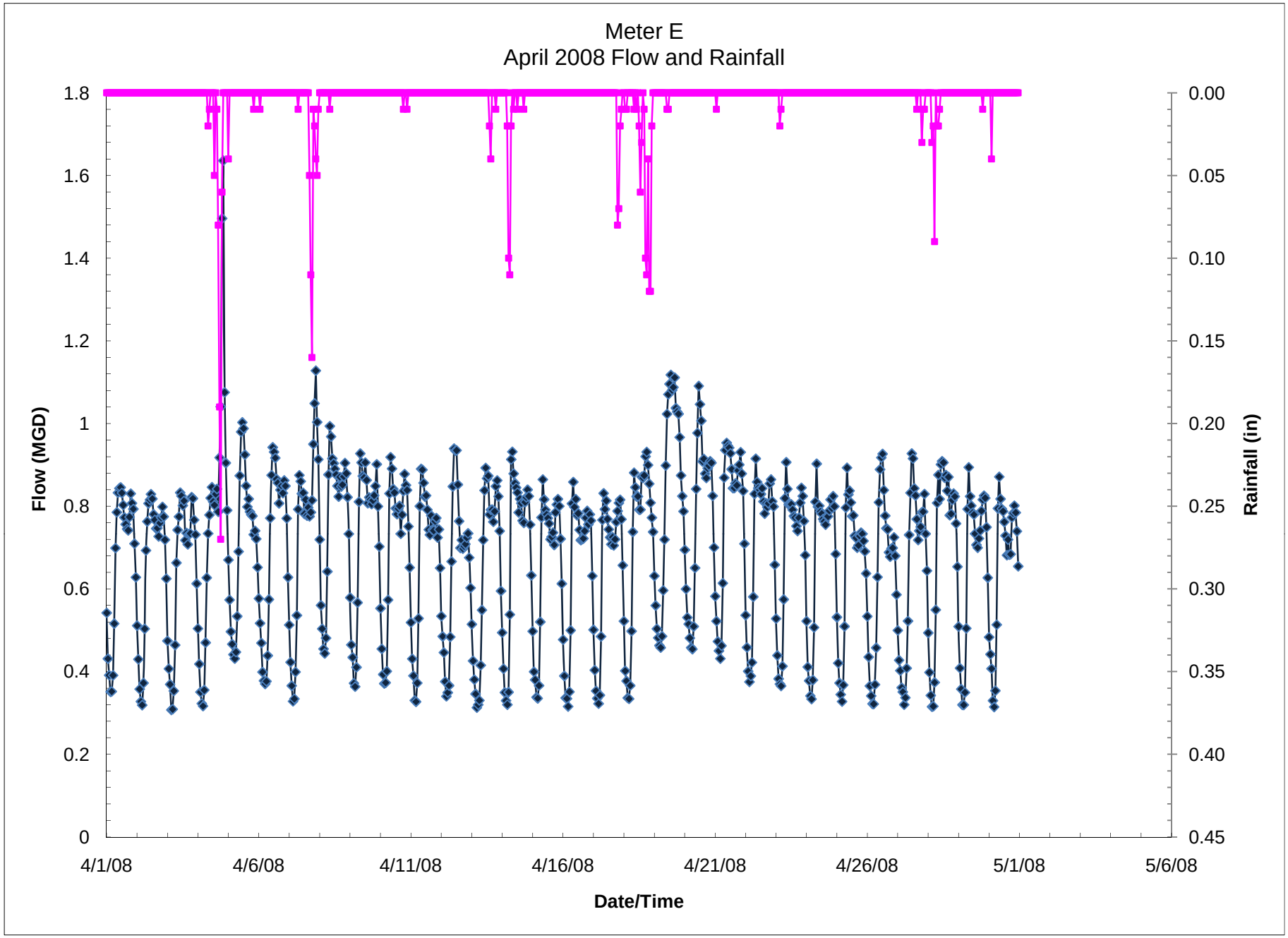
August 2008

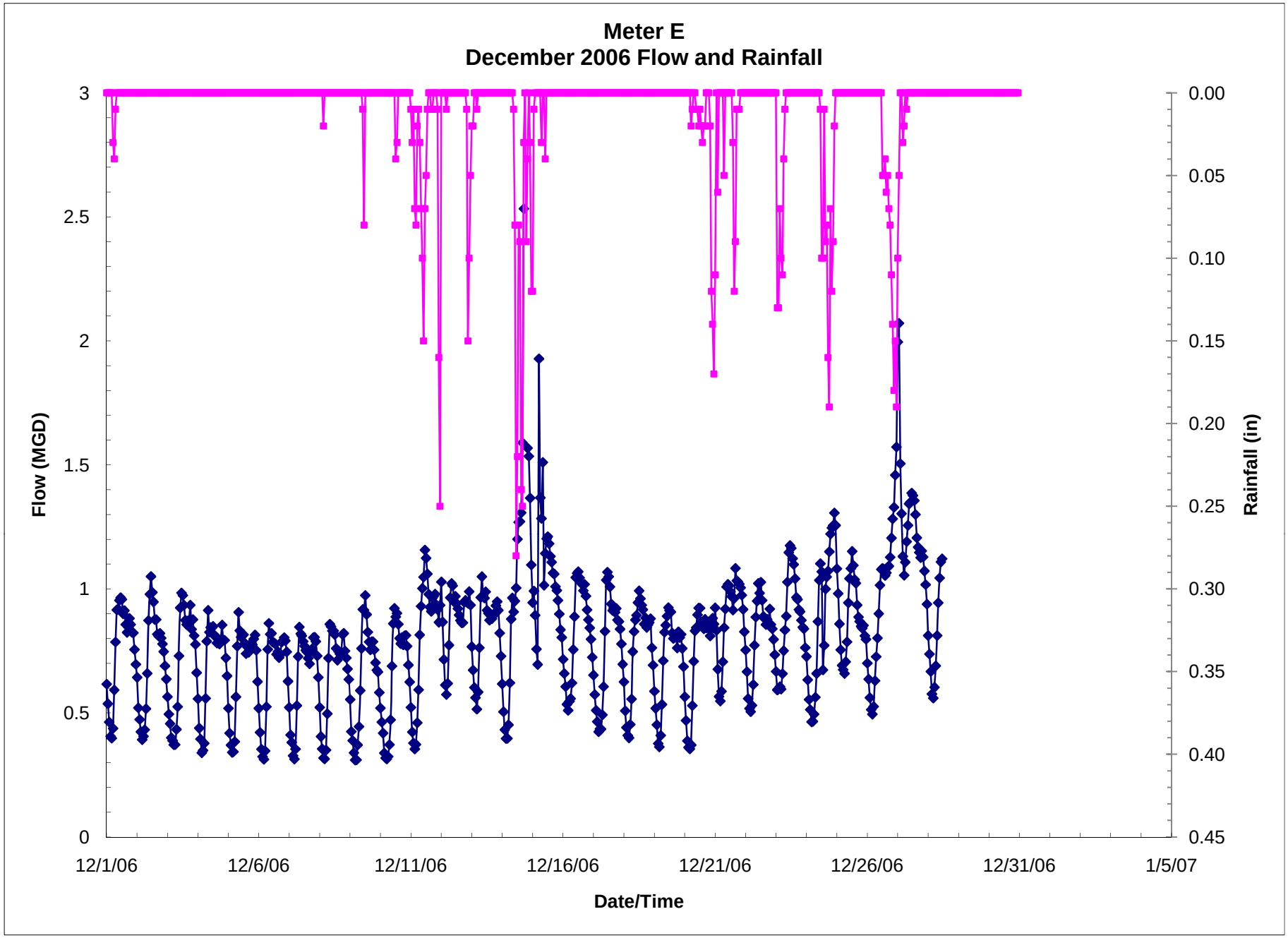
April 2008

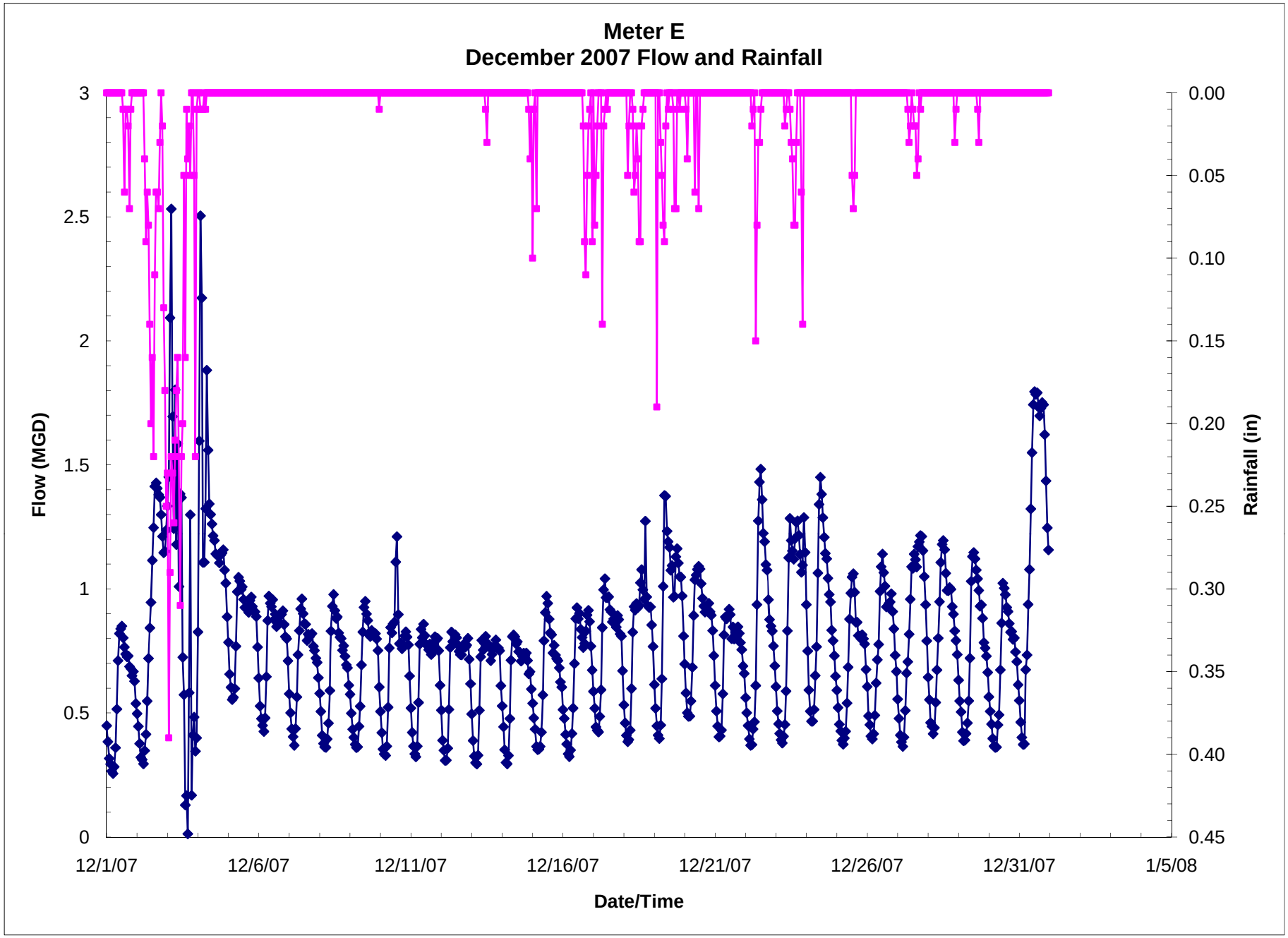
December 2006

December 2007


Meter E
August 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
9/5/08


Meter E
April 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Meter E
December 2006 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
3
2.5
2
1.5
1
0.5
0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07


Meter E
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
3
2.5
2
1.5
1
0.5
0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

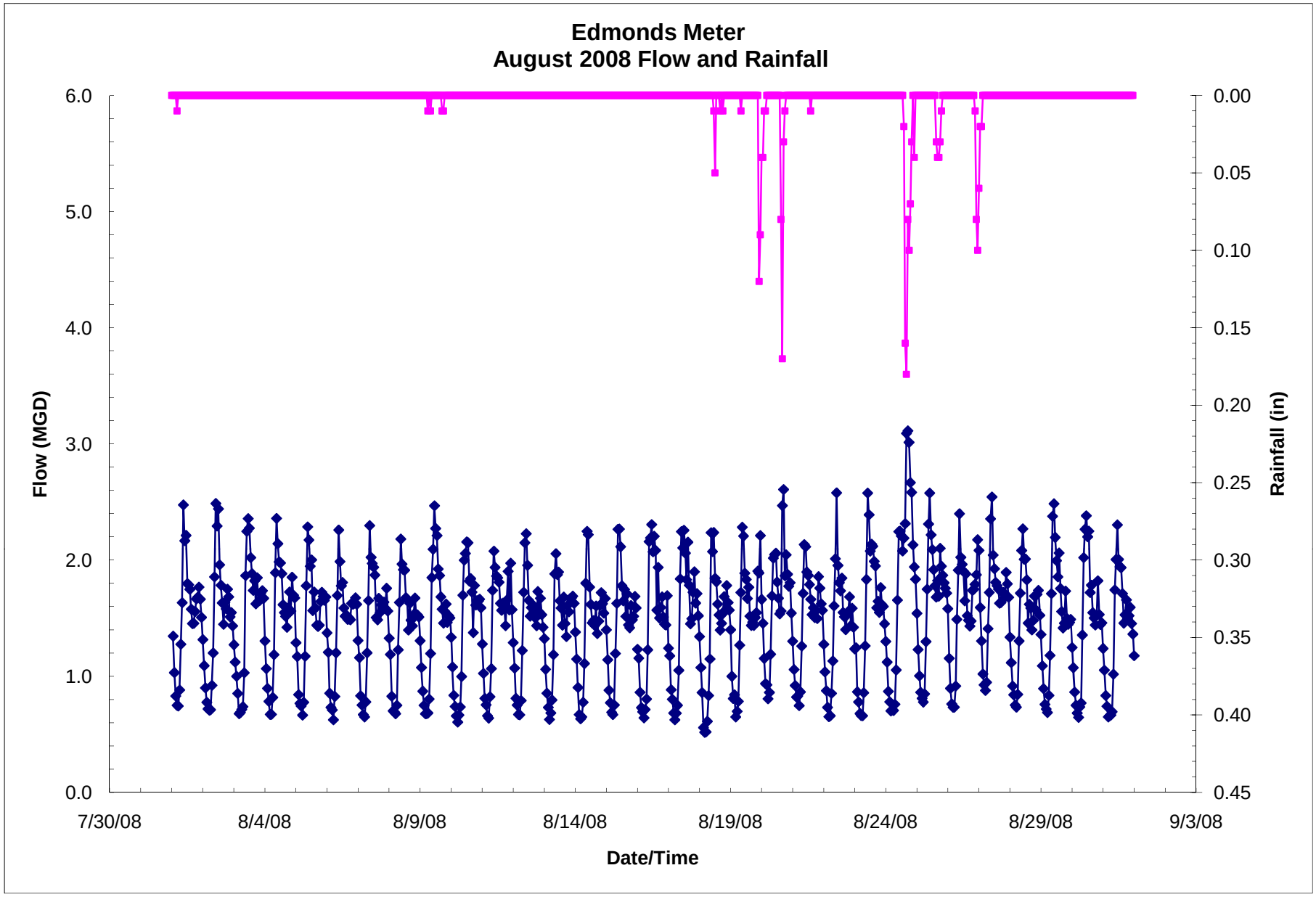
Edmonds Meter

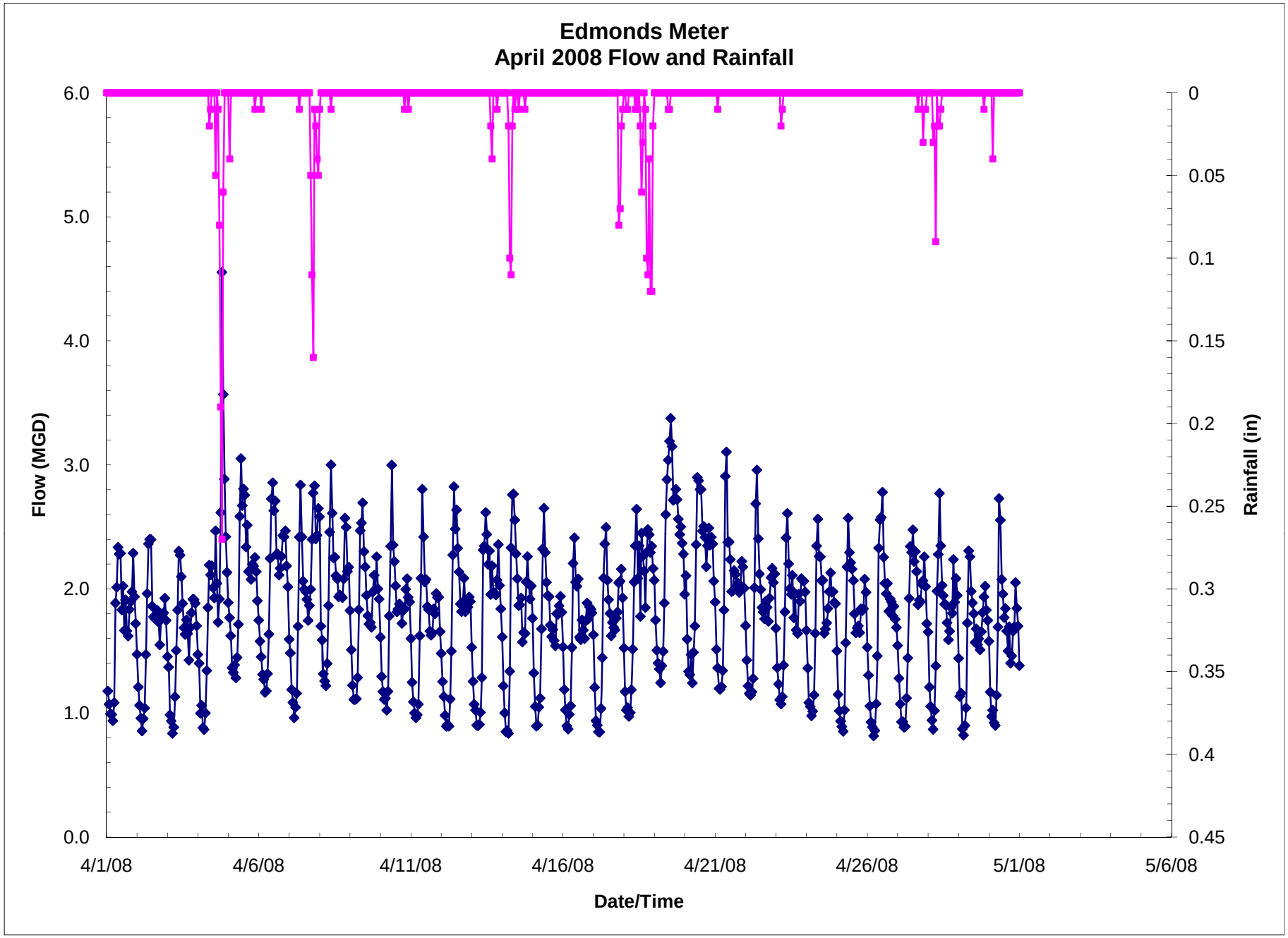
August 2008

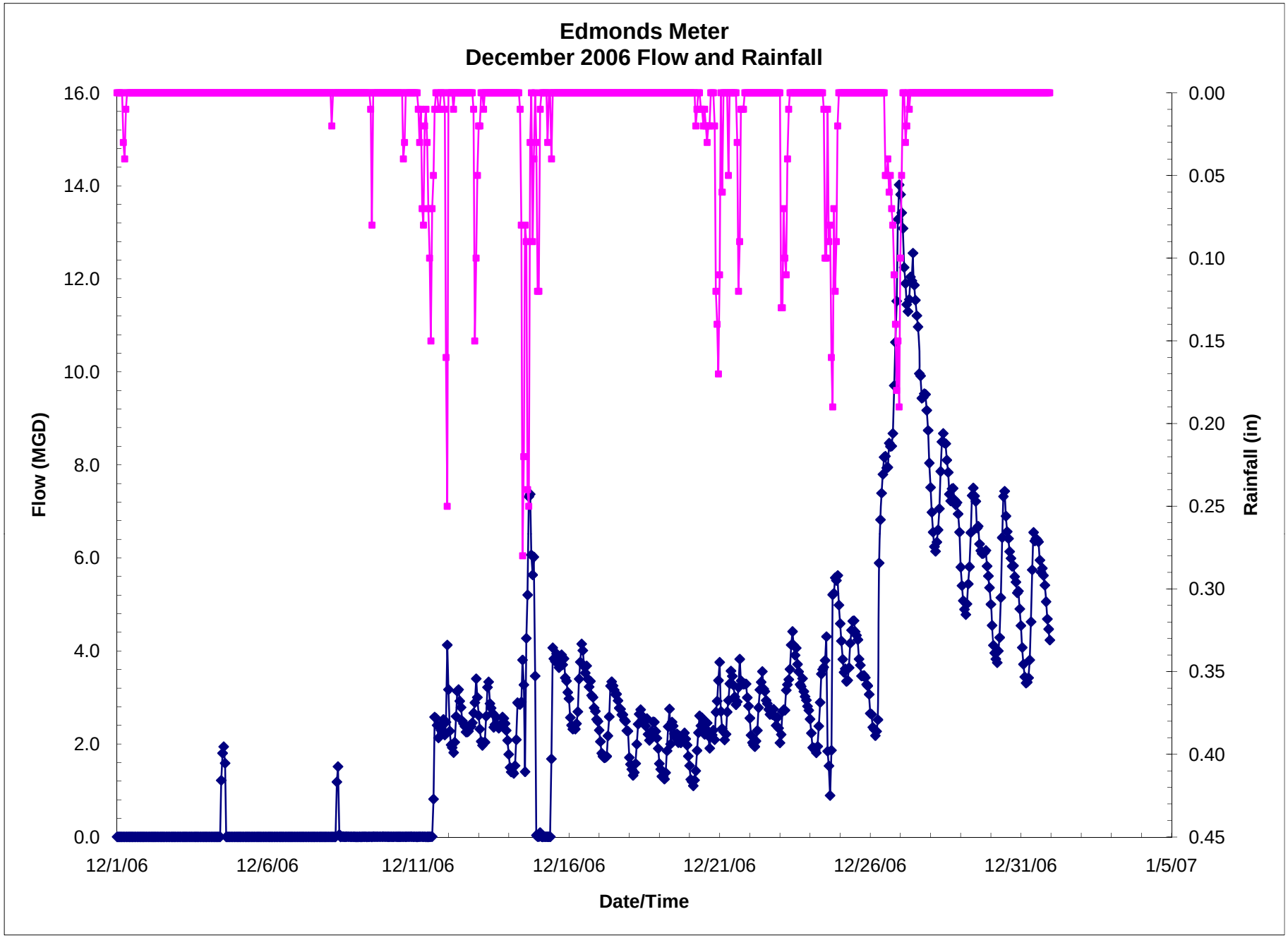
April 2008

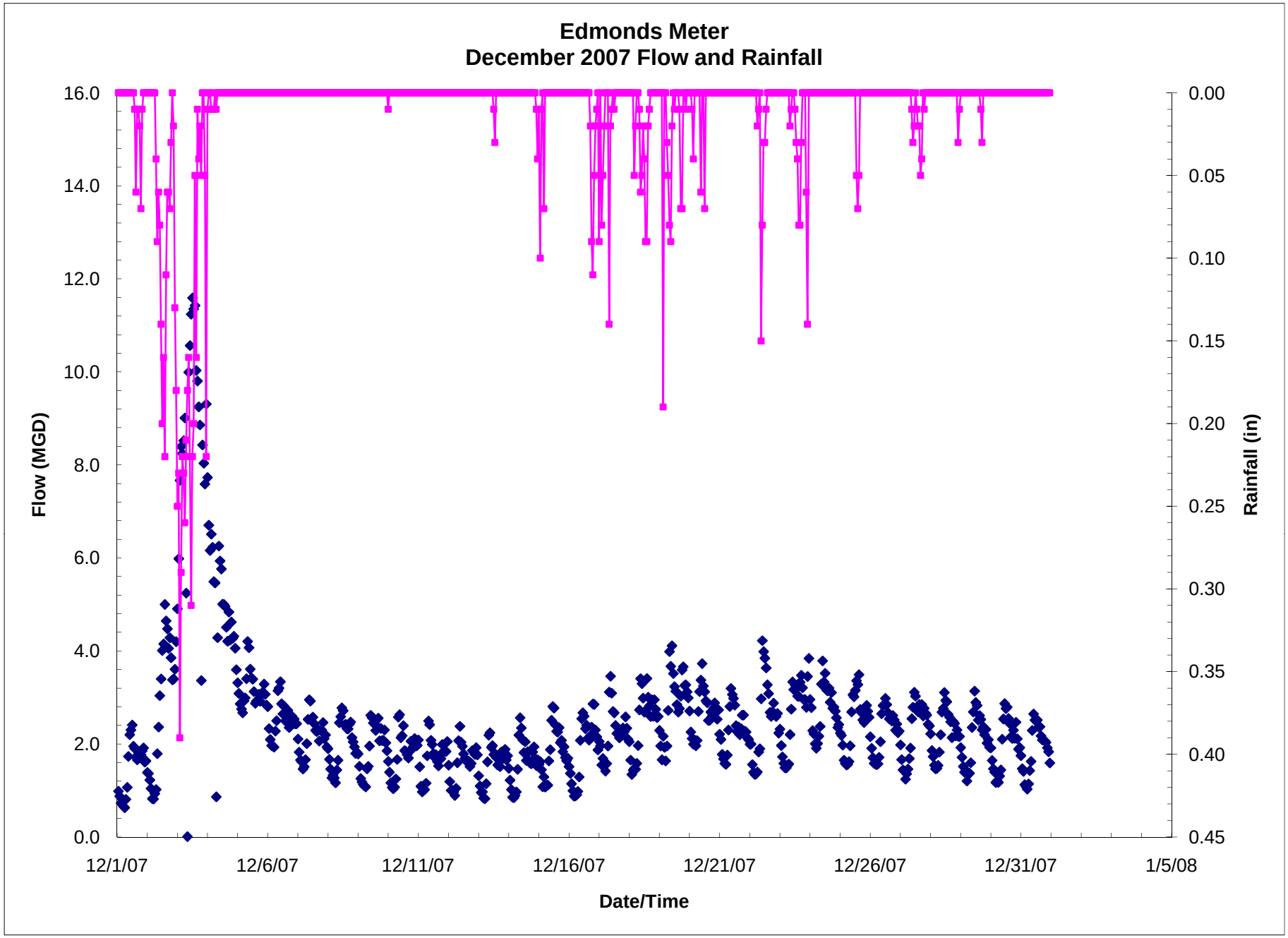
December 2006

December 2007


Edmonds Meter
August 2008 Flow and Rainfall
Flow (MGD)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
7/30/08
8/4/08
8/9/08
8/14/08
8/19/08
8/24/08
8/29/08
9/3/08
Date/Time


Edmonds Meter
April 2008 Flow and Rainfall
Flow (MGD)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Rainfall (in)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08
Date/Time


Edmonds Meter
December 2006 Flow and Rainfall
Flow (MGD)
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07
Date/Time


Edmonds Meter
December 2007 Flow and Rainfall
Flow (MGD)
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08
Date/Time

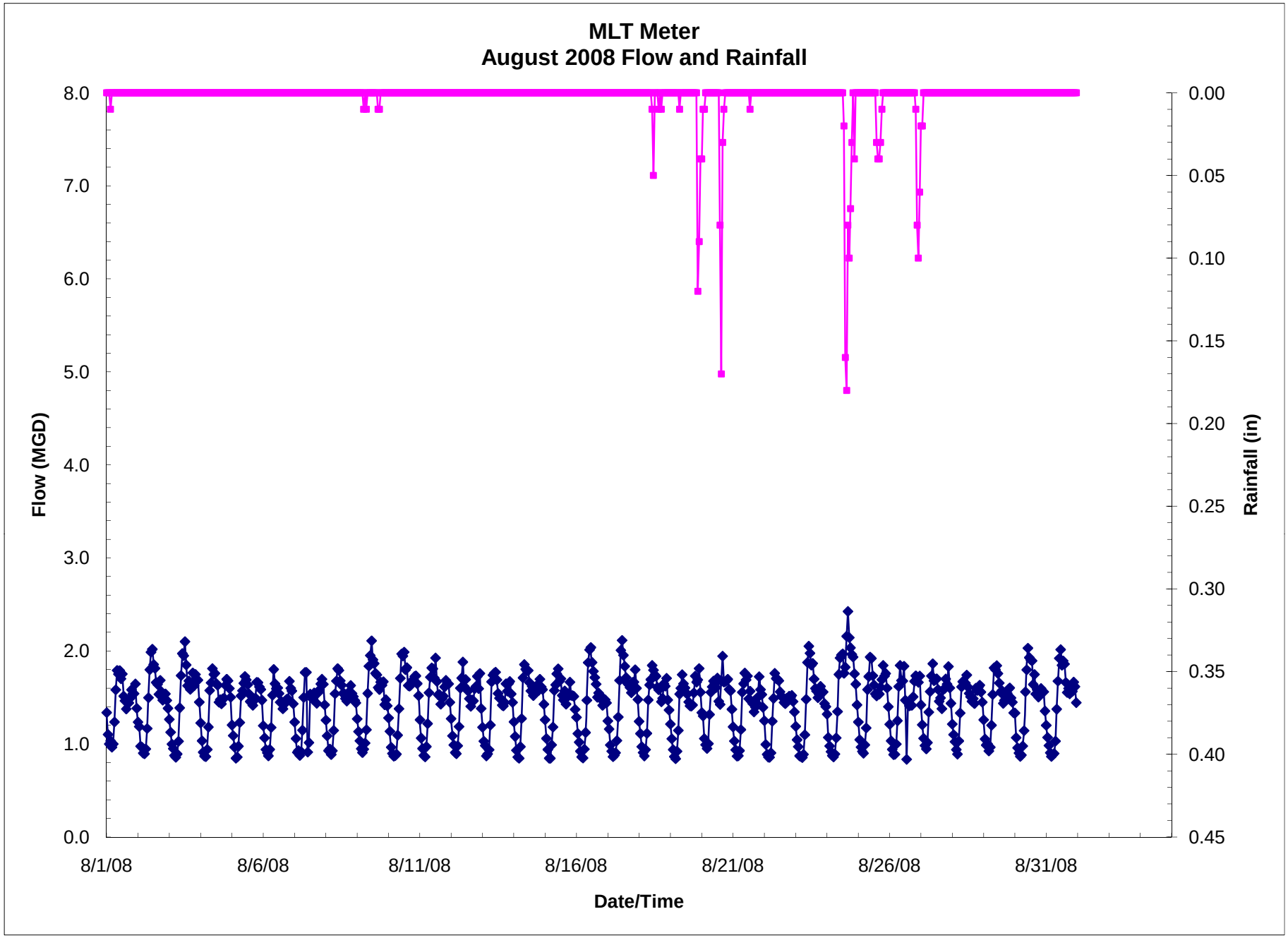
MLT Meter

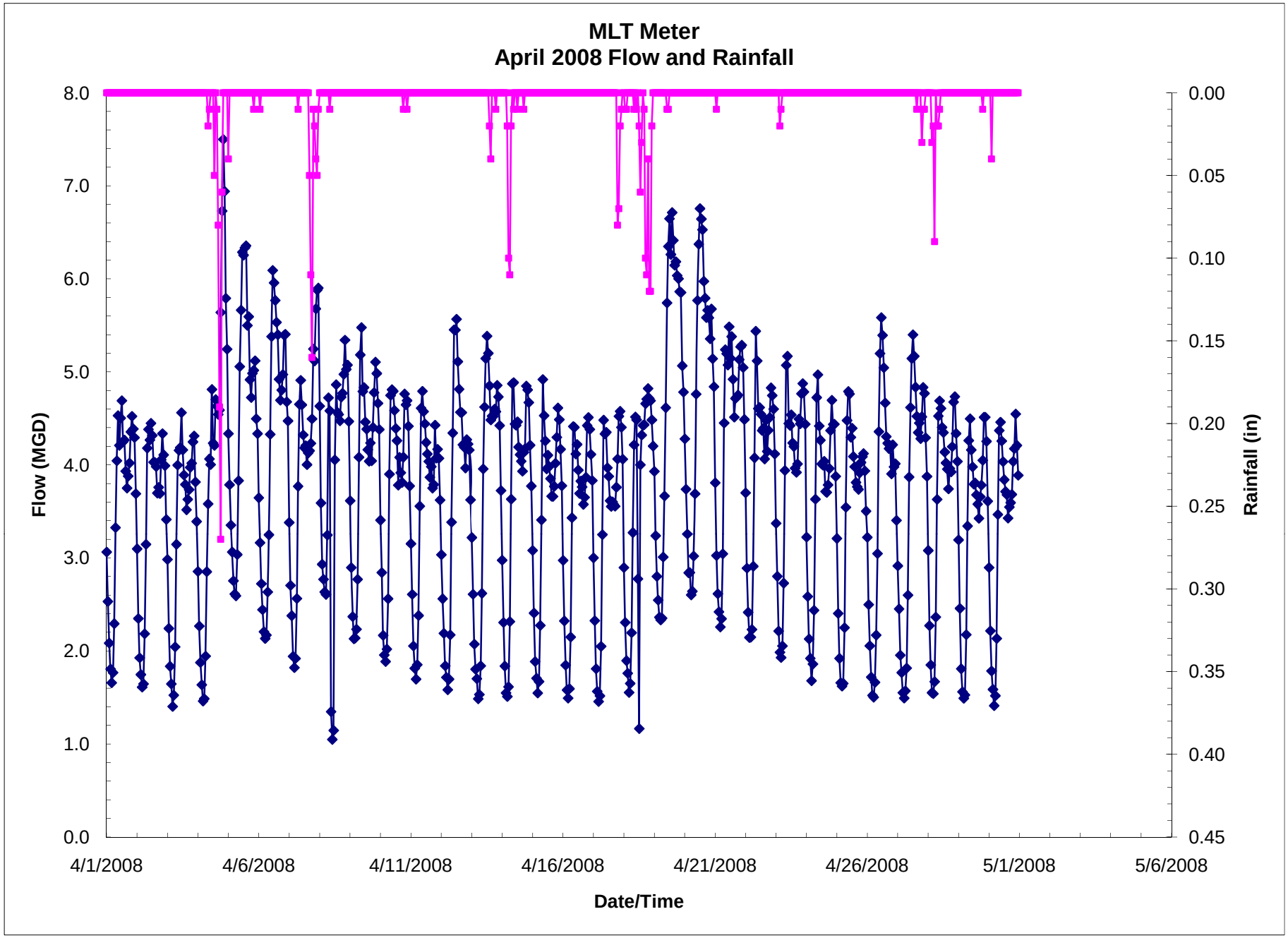
August 2008

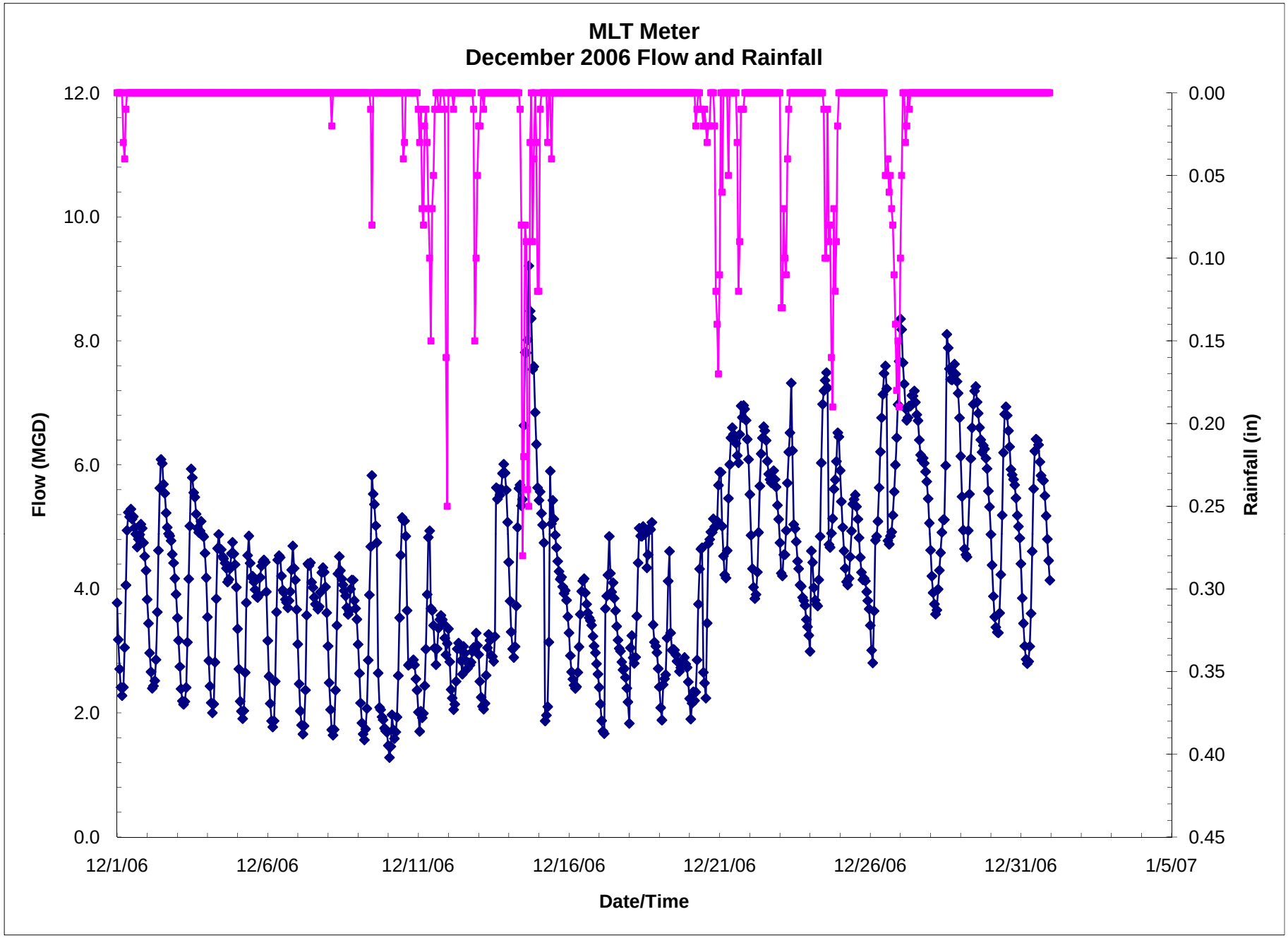
April 2008

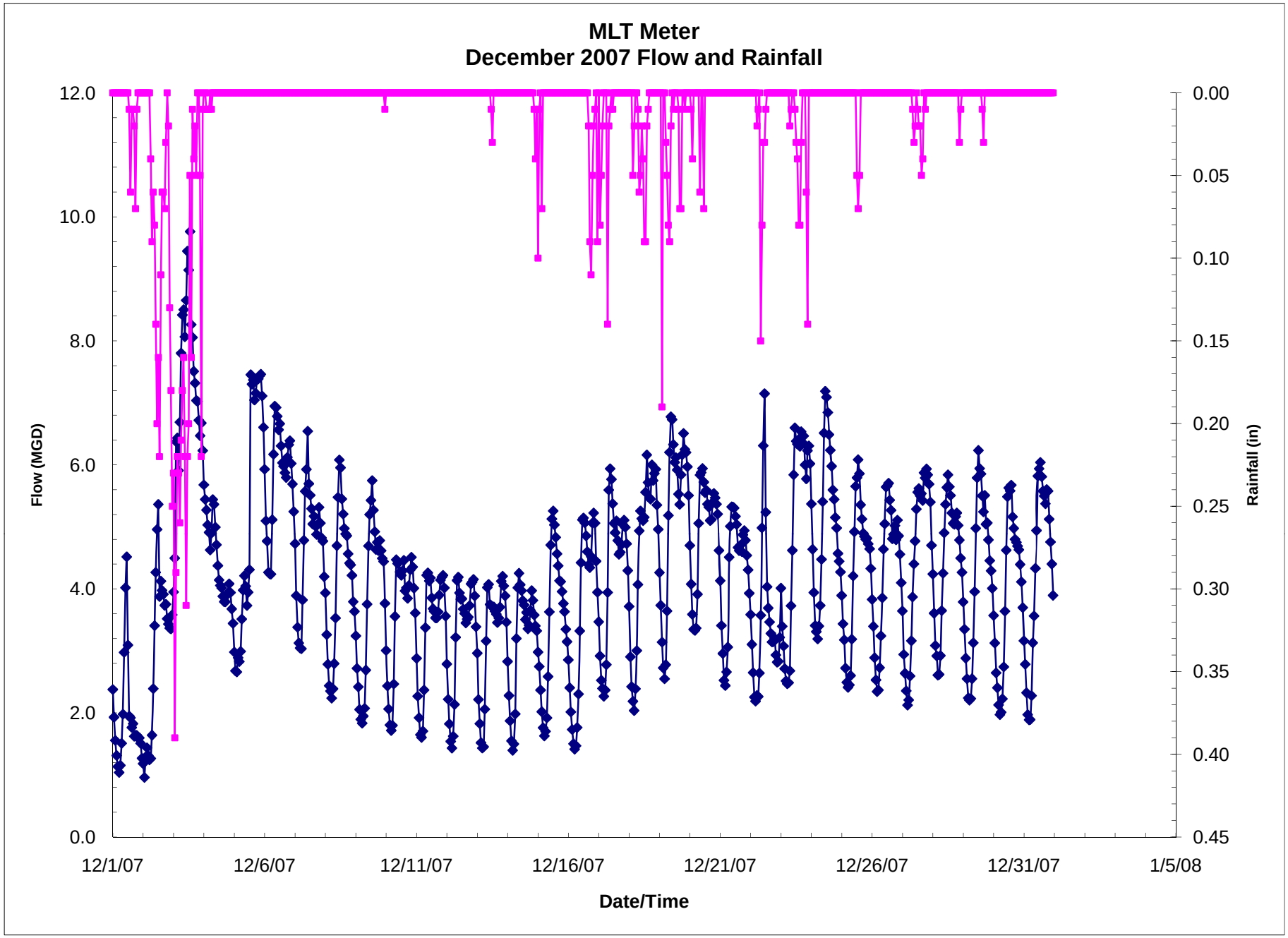
December 2006

December 2007


MLT Meter
August 2008 Flow and Rainfall
Flow (MGD)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
Date/Time


MLT Meter
April 2008 Flow and Rainfall
Flow (MGD)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
4/1/2008
4/6/2008
4/11/2008
4/16/2008
4/21/2008
4/26/2008
5/1/2008
5/6/2008
Date/Time


MLT Meter
December 2006 Flow and Rainfall
Flow (MGD)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Rainfall (in)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/06
12/6/06
12/11/06
12/16/06
12/21/06
12/26/06
12/31/06
1/5/07
Date/Time


MLT Meter
December 2007 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
12/1/07
12/6/07
12/11/07
12/16/07
12/21/07
12/26/07
12/31/07
1/5/08

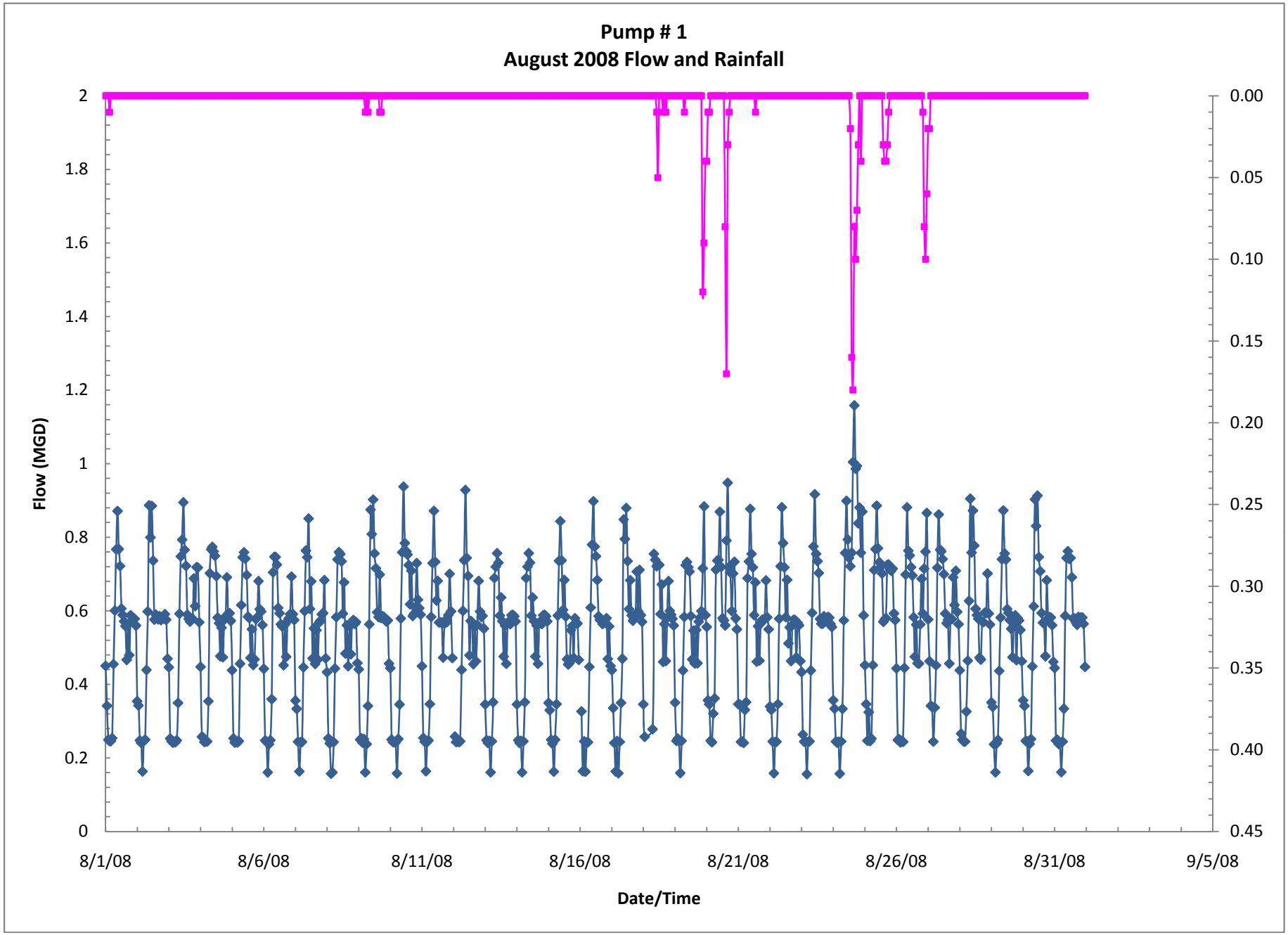
Lift Station No. 1

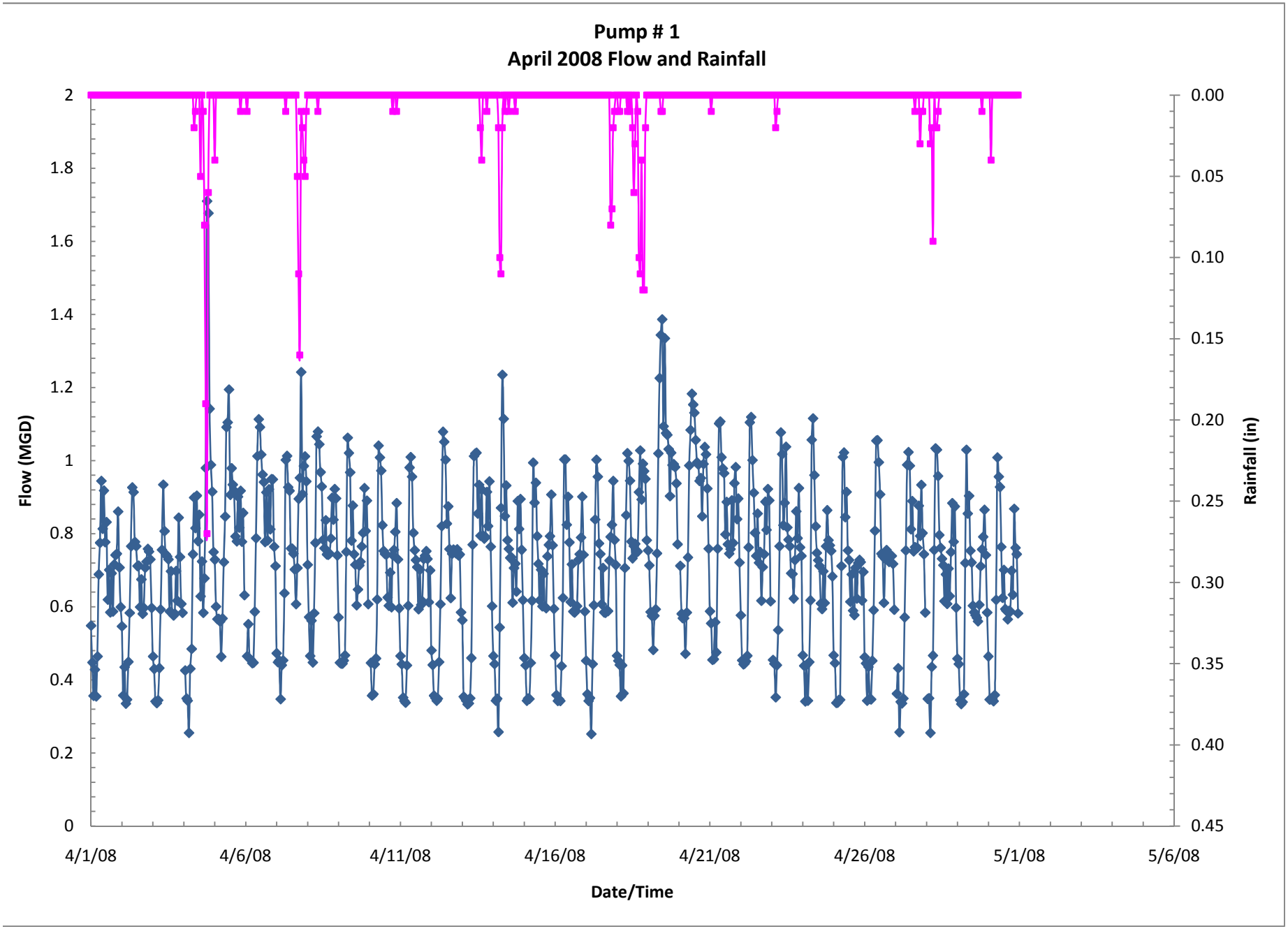
August 2008

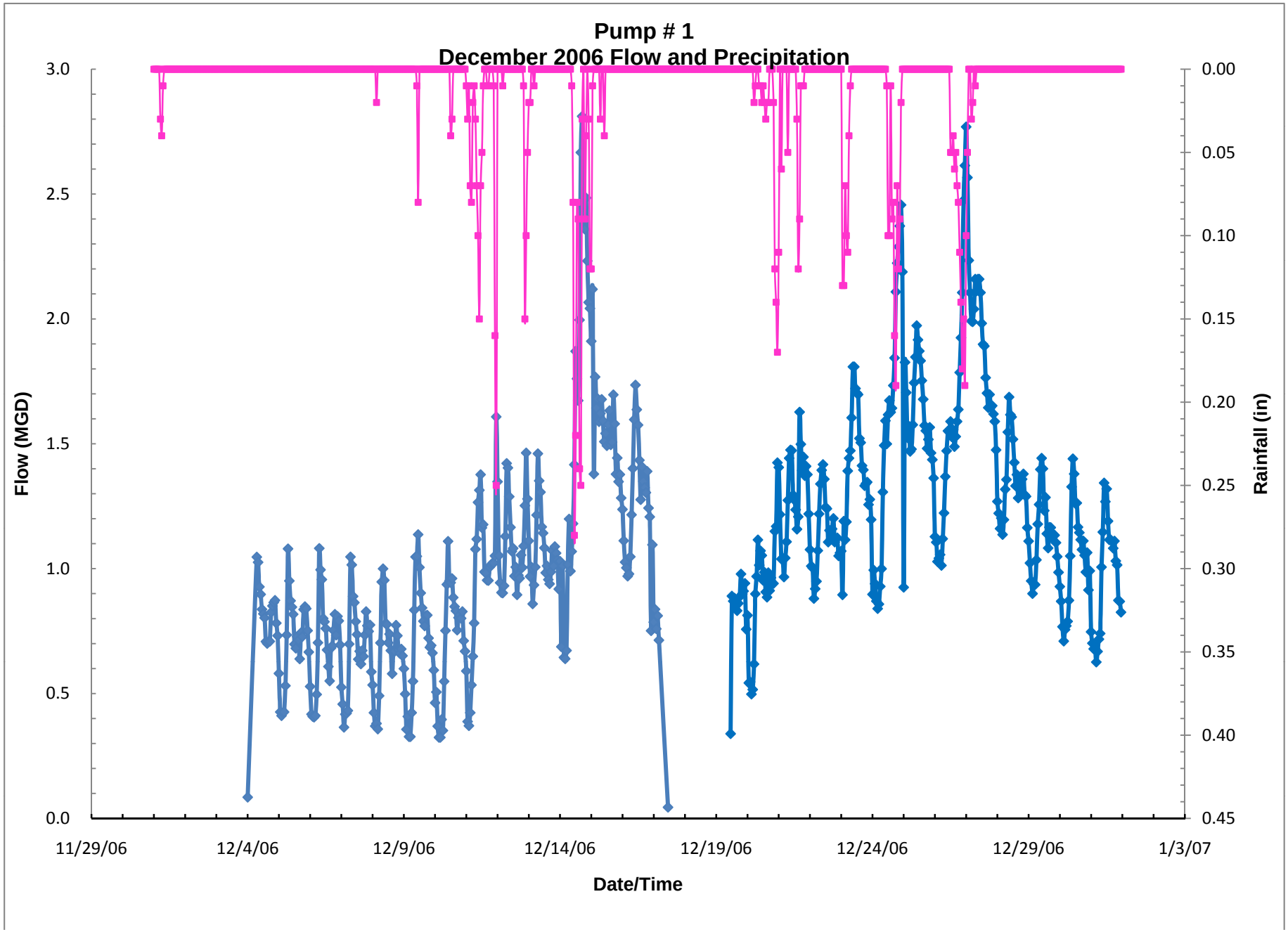
April 2008

December 2006

December 2007


Pump # 1
August 2008 Flow and Rainfall
Flow (MGD)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
8/1/08
8/6/08
8/11/08
8/16/08
8/21/08
8/26/08
8/31/08
9/5/08
Date/Time


Pump # 1
April 2008 Flow and Rainfall
Flow (MGD)
Rainfall (in)
Date/Time
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
4/1/08
4/6/08
4/11/08
4/16/08
4/21/08
4/26/08
5/1/08
5/6/08


Pump # 1
December 2006 Flow and Precipitation
Flow (MGD)
Rainfall (in)
Date/Time
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
11/29/06
12/4/06
12/9/06
12/14/06
12/19/06
12/24/06
12/29/06
1/3/07

Appendix B

Proposed Standards, Policies and Guidelines

Standards

a.	S-1	Storm Drainage Connections to the Sanitary Sewer System
b.	S-2	Connections to Existing Sewer System
c.	S-3	Allowable Connections to Side Sewers
d.	S-4	Visual Inspection of Manholes for SSES Investigations
e.	S-5	CCTV Inspections of Sewers for SSES Investigations
f.	S-6	Smoke Testing for SSES Investigations
g.	S-7	Dye Testing for SSES Investigations
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I/I DISCHARGE SITE CONDITIONS

TITLE: Storm Drainage Connections to the Sanitary Sewer System

STANDARD NO. S-1

I/I CONTROL MEASURE ISSUE:
Direct connection of storm water collection systems to the sanitary sewer system reduces the capacity of the sewer system and increases surcharging potential of the pipe, which can contribute to sewer deterioration and increase the potential for pipeline collapse. Some agencies allow surface water runoff collected from areas subject to high pollutant loading to discharge to the sanitary sewer. Numerous connections of this type can overload the Edmonds sanitary sewer collection system.

STANDARD

- No storm drainage connections shall be made to the sanitary sewer system unless approved by the City of Edmonds, and only under special circumstances. The discharges shall be defined by discharge permit, contract or other such document.

POTENTIAL EDMONDS IMPACTS

- Provisions will need to be addressed for water quality treatment from surface water collection areas subject to high pollutant loading that the City may have previously connected to the sanitary sewer system.
- Requests to connect storm water collection areas to the sanitary sewer system will have to be reviewed for conformance with the special circumstances developed by the City.
- Special fee structures may be adopted for connection of storm drainage sources to the sanitary sewer system.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impact.

TITLE: Connections to Existing Sewer System

STANDARD NO. S-2

I/I CONTROL MEASURE ISSUE:
When new connections are made to the existing sewer system, I/I potential exists from three general locations: 1) the connection itself leaks, 2) the system being added has leaks, and/or 3) the system being added has illegal connections that are inflow sources.

STANDARD

- Connections to the existing sewer system will only be allowed at manholes, to a main via an existing tee or a tap, or to the end of an existing pipe that meets all applicable I/I Standards.
- Where a new manhole is being installed in an existing system, the I/I Standards for new manholes shall apply.

Testing and inspection:

- The new conveyance system to be connected shall be inspected to confirm that no illicit connections contributing inflow have been added.
- At manhole locations, the connection at the existing manhole shall be visually inspected for water tightness after the pipe has been completely backfilled and groundwater has returned to its natural elevation. The new line shall not be put into service until the connection has been inspected and approved.

POTENTIAL EDMONDS IMPACTS

- Inspection requirements to confirm work performed correctly.

POTENTIAL PRIVATE PROPERTY / RATEPAYER IMPACTS

- No impact.

TITLE: Allowable Connections to Side Sewers

STANDARD NO. S-3

I/I CONTROL MEASURE ISSUE:
A description is given of allowable and disallowable connections to side sewers for the purpose of eliminating clean surface and subsurface drainage flow to the City of Edmonds sewer system.

STANDARD

- Side sewers discharging to the sewer system shall convey sanitary sewage only. Sanitary sewage sources are limited to:
  - Building plumbing outlets.
  - Sump Pumps conveying sanitary sewage.
- Sources of clean water flow shall not be conveyed by side sewers discharging to the sewer system, including:
  - Downspouts.
  - Foundation drains.
  - Catch basins.
  - Storm water inlets and trench drains.
  - Structure or landscaping under-drain systems.
  - Sump pumps discharging surface runoff or subsurface drainage flow.

POTENTIAL EDMONDS IMPACTS

- Allowable connections to side sewers shall be in conformance with applicable plumbing codes.
- Newly developing building sites will be required to establish separate surface and sub surface drainage systems compatible with the developed site grading, soil conditions, groundwater table, and adjacent environmentally sensitive areas. Comprehensive monitoring for disallowable side sewer connections will be required, particularly where alternate disposal requirements for drainage are onerous to the property owner.
- It is expected that some existing building sites will be found to be discharging clean water to the side sewer, either as a result of partial failure of side sewers, or as a result of illicit connections. When implementing corrective measures for these sites, consideration must be given to disposition of the resulting displaced flows. New site drainage systems implemented for this purpose must be compatible with the developed site grading, soil conditions, groundwater table, and adjacent environmentally sensitive areas.
- Requirements for newly developing sites are consistent with most current development regulations and should not result in development costs above and beyond current requirements.
- Repair of failed side sewers will result in varying levels of cost on a per site basis. Incremental cost impacts will be associated with the following factors:
  - Side sewer length.
  - Site development features (i.e. structures, landscaping, pavement, etc.).
  - Site accessibility (i.e. slope, overgrowth, sensitive areas, etc.).
- Disconnection of clean water sources from side sewers on developed sites will result in varying levels of cost on a per site basis. Incremental cost impacts will be associated with the following factors:
  - Distance to alternative discharge point for clean water flows.
  - Presence of environmentally sensitive areas.
  - Relative elevation of property to alternative discharge point.
  - Ground water elevation.
  - Site elevation relative to surrounding areas.

- Proportion of impermeable area on the site.

- Testing to determine the presence of failed side sewer conditions that might allow clean water to enter the system cannot be comprehensively achieved except during wet weather conditions that result in saturated ground conditions. Testing for this purpose is best achieved on a basin wide basis through flow monitoring and analysis, or potentially through television inspection.
- Testing for illicit downspout connections and certain area drain connections can be achieved, under favorable conditions, through smoke testing. Some illicit connections of surface or subsurface drainage will not be detected through smoke testing, but might be detectable using dye testing.
- Generally, basin wide testing for illicit connections is implemented prior to the implementation phase to determine where remedial actions may be required. Site specific testing during implementation of the remedial work may be helpful in determining the effectiveness and completeness of the work being undertaken.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Dependent on implementation of City-funded activities. See Policy 3.

PRELIMINARY ENGINEERING

TITLE: Visual Inspection of Manholes for SSES Investigations

STANDARD NO. S-4

I/I CONTROL MEASURE ISSUE:
Manhole inspections are one of the most important efforts of a sewer system evaluation survey (SSES) investigation because manholes can account for a significant amount of the I/I entering a sanitary sewer system. The inspection provides a means for viewing the manhole internally to assist in:

- Determining whether the cover is subject to ponding or surface water runoff.
- Inspecting for internal leaks.
- Analyzing structural deficiencies in the manhole structure.
- Estimating I/I quantities in the manhole.

Investigation of the internal condition of a manhole should be conducted from the inside of the manhole. Performing the investigation only from the surface and failing to thoroughly check the manhole interior commonly results in an inadequate inspection. Leaks around taps in the manhole are often confused with flow from the tap itself. If not closely inspected, leaks on the floor, in the channel, and around the pipe seals are often misidentified as eddies in the normal pipe flow.

STANDARD

- Visual inspection of manholes shall be performed by experienced personnel trained in the proper safety measures for performing the inspection including, but not limited to, confined space entry and traffic control measures. It is recommended that the visual internal inspection be performed during the wet season when surrounding soils are fully saturated. Results of the manhole inspections shall be documented on a standard form which contains the following information:
    - Manhole identification or reference number and street location.
    - The date of the inspection.
    - Name of the inspector.
    - Pavement surface type and condition.
    - Whether the manhole cover is depressed below the adjacent surface grade and whether its location makes it subject to surface water flows or ponding.
    - Significant site features that may affect rehabilitation access or methods, including whether the manhole is located on private property or is located near sensitive habitat.
    - Cover information including size, number of pick holes, gasket condition, if present, and whether the cover is locking or not.
    - Frame information including size, grade, condition and presence and condition of an internal boot.
    - Chimney information including material and condition, diameter, height, seal condition at cone or top slab, presence and location of manhole steps, and evidence of infiltration.
    - Cone information including type and condition, seal at barrel and evidence of infiltration.
    - Barrel information including type, lateral locations, diameter and condition, seal at bench and bottom slab, and evidence of infiltration. Location and size of cracks and leak locations shall be documented.
    - Condition of channel and bench concrete and location of infiltration at the flow line and bench.
    - Presence, location and condition of drop connections.
- Manhole inspection results shall be archived by the City of Edmonds.

POTENTIAL EDMONDS IMPACTS • Training and upgrading of staffing skills to perform the manhole inspections and interpret results, if not contracted with outside vendors. • Additional staff resources (FTEs) may be required. • Additional staff time for conducting inspections, interpreting results, reporting and archiving of data.
POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS • No impacts.

TITLE: Closed Circuit Television (CCTV) Inspection of Sewers for SSES Investigations

STANDARD NO. S-5

I/I CONTROL MEASURE ISSUE:
CCTV inspection during a sewer system evaluation survey (SSES) provides a safe, low-cost and rapid means for viewing the sewer line internally to assist in:

- Determining the physical condition of pipe joints.
- Analyzing structural deficiencies and corrosion in pipelines.
- Identifying sources of I/I.
- Estimating quantity of infiltration.
- Identifying changes in the sewer from the last CCTV inspection.

STANDARD

CCTV inspection of sewers for an SSES investigation shall include a complete television inspection of the sewer main and may include laterals and side sewers that connect to the main. It is recommended that the CCTV inspection be performed during the wet season when surrounding soils are fully saturated. The decision to CCTV inspect laterals and side sewers shall be based on evidence that a significant source of the I/I originates from the laterals or side sewers. The factors that shall be considered include:

- Flow monitoring data that suggests rapid infiltration.
- Lack of I/I sources identified from CCTV inspection of the sewer main or smoke testing.

Sewer cleaning shall be performed before beginning television inspection of sewer mains, laterals and side sewers. Television inspection shall be accomplished using a closed-circuit system specifically designed for sewer inspections. For each pipeline inspected, records shall be collected both digitally and on a field form. The digital record shall include the date of the inspection and a brief narrative description of the pipeline being inspected (manhole to manhole run, or service address) and discuss each defect that is observed. Field forms for sewer main inspections shall contain the following information:

- The date of the inspection.
- Name of CCTV crew members and their company or agency.
- The reason for the inspection.
- The location of the pipeline and the upstream and downstream manhole numbers.
- The direction of the camera's travel.
- The pipe size, type, pipe joint length, and overall footage of the inspected sewer.
- The location and a description of each service connection.
- A description of each defect observed and its distance from the point at which the viewing began.
- Severity of I/I at each defect location.

Field forms for lateral and side sewer inspections shall contain the following information:

- The date of the inspection.
- Name of CCTV crew members and their company or agency.
- The reason for the inspection.
- The service address.
- The pipe size, type, pipe joint length, and overall footage of the inspected lateral/side sewer.
- A description of each defect observed and its distance from the point at which the viewing began.

- Severity of I/I at each defect location.
- The location and a description of any observed connections to the lateral/side sewer.

Field forms and digital record of inspections shall be archived by the City of Edmonds so that they may be compared to subsequent CCTV inspections that are performed on the same portions of the line. Videotaped footage of the CCTV inspection is an acceptable alternative to digital footage.

POTENTIAL EDMONDS IMPACTS

- Training and upgrading of staffing skills to perform the CCTV inspections and interpret results, if not contracted with outside vendors.
- Additional staff resources (FTEs) may be required.
- Acquisition of CCTV inspection equipment and vehicles, or contracting with outside vendors.
- Additional staff time for conducting inspections, interpreting results, reporting and archiving of data.
- Additional cost for CCTV of laterals/side sewers.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impact.

TITLE: Smoke Testing for SSES Investigations

STANDARD NO. S-6

I/I CONTROL MEASURE ISSUE:
Smoke testing is the process of blowing a nontoxic smoke made from mineral oil at low pressure into the sewer system. Smoke testing provides a low-cost and rapid means for determining direct connections of inflow and rainfall-induced infiltration sources, such as:

- Roof drains
- Foundation drains
- Catch basins
- Area drains
- Abandoned building sewers
- Uncapped cleanouts
- Illegal connections
- Storm sewer cross connections

STANDARD

Smoke testing for sewer system evaluation survey (SSES) investigations shall be performed by experienced personnel who know the effects of groundwater table, frozen ground, wind, rain, trapped service connections and snow cover on the test findings. Smoke used for the testing shall be non-toxic, odorless and non-staining. Blower capacity shall be determined based on the size of area to be tested, but in no case shall it be less than 1,750 cfm. The vacuum effect of flowing water drawing smoke downstream shall be taken into account. Police and fire departments shall be notified daily of test locations, and residents shall be notified in advance of the testing by a written testing notice. Residents shall also be informed individually on the day of testing by personnel having proper identification. The following chronological steps shall be used for smoke testing:

- Isolate the sewer main line to be tested with plugging up to 400 feet at a time noting any surcharged line sections. Smoke will not pass through a flooded section.
- Prepare a basic smoke sketch of the area being tested including location, date and the name of the company or agency and personnel performing the test.
- Commence smoke testing using one blower at each manhole and enough smoke bombs to ensure smoke travels throughout the entire test section. Smoke shall be continuously generated while visual inspection and photography are in progress.
- Visually inspect the entire area by walking around front and back yards and around buildings. Watch for smoke leaks; typical sources are roof leaders, area drains, foundation drains, house foundations, holes in the ground over the sewer or services, areas around manholes, and catch basins. Roof vents are not to be considered as smoke leaks.
- Document whether or not smoke is observed to be discharging through the roof vents for each house and building included in the test area.
- Photograph all smoke leaks.
- Show the location of each leak on a sketch. Include the photograph number and compass directions taken, and a description of the leak including address. Provide dimensions to the leak from at least two easily identified site features and the estimated area (square footage) and surface type (i.e., grass, pavement, etc.) drained by the leak.
- Photographs shall show the maximum amount of smoke emitted from the leak and the exact source of the leak. Photographs shall be taken from far enough back to provide a physical reference to the location of the smoke. They shall be numbered consecutively to ensure leaks can be identified at a later date.

POTENTIAL EDMONDS IMPACTS • Time and resources to conduct smoke testing, if not already part of City procedures. • Acquisition of smoke testing equipment, if not already owned. • Cost for additional staff workload, or contract with outside vendor.
POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS • Identified defects and illicit connections on private property may need to be corrected by the property owner.

TITLE: Dye Testing for SSES Investigations

STANDARD NO. S-7

I/I CONTROL MEASURE ISSUE:
Dye testing is a rainfall simulation technique used to identify specific defects that can contribute I/I during rainfall or snowmelt. Dye testing can also be effective in quantifying the amount of I/I that can enter a section of sewer or specific defect under a controlled runoff situation. Depending on the sources of I/I to be identified and the configuration of the runoff situation being simulated, the procedures for dye testing differ. Five examples of dye testing situations are as follows:

- **Determining Conditions Caused by Storm Drains**—Storm drains that parallel or cross sanitary sewer pipes and have an invert elevation higher than the crown elevation of the sanitary sewer can be a source of rainfall-induced infiltration or inflow. They are inflow sources if there are cross connections between the storm drain and the sanitary sewer; they are infiltration sources if stormwater can exfiltrate from them, percolate through soil, and enter the sanitary sewer through pipe or joint defects.
- **Determining Conditions Caused by Stream or Ditch Sections**—Streams and stormwater ditches are inflow sources if there are cross connections between them and the sanitary sewer; they are infiltration sources if the surface water can percolate through soil and enter the sanitary sewer through pipe or joint defects.
- **Identifying I/I Sources from Private Property**—Roof leaders; basement, yard and area drains; foundation drains; abandoned building sewers; and faulty connections are sources of private property defects that can be identified by dye testing.
- **Identifying Structurally Damaged Manholes**—Dye testing can be used to verify structurally damaged manholes that leak when subjected to flooding or when groundwater elevations are high.
- **Verifying Sources Found by Other Testing Means**—Dye testing can verify suspected sources of I/I identified in a visual survey or smoke testing study. Examples include manholes affected by surface water runoff, holes in the ground smoking over services or sewer mains, and cracks in the street pavement that are smoking.

STANDARD

- Dye testing for sewer system evaluation survey (SSES) investigations shall be performed by experienced personnel trained in the proper safety measures for performing the testing including, but not limited to, confined space entry into storm drain and sanitary sewer manholes, measures for controlling water head buildup behind plugs, and traffic control measures. A fluorescent dye having a distinct color readily detectible by eye shall be used for dye testing. The dye shall be safe to handle, visible in low concentrations, miscible in water, biodegradable and inert to solids and debris in the sewer. Procedures for dye testing shall be as follows:

Determining Conditions Caused by Storm Drain

1. Plug both ends of the storm drain section to be tested with sand bags or sewer plugs and block all overflow and bypass points in the storm drain section. Bypass flow around the section under test if necessary.
2. Fill the storm drain section and stormwater inlets or catch basins to just below the grate with water. Add dye to the water.
3. Monitor the next downstream manhole in the sanitary sewer system for evidence of dyed water.
4. Measure the flow in the sanitary sewer manhole before and during dye testing. As an alternative, measure flow simultaneously at both the upstream and downstream sanitary

manholes during the test.

5. Record the location of storm drain and sanitary sewer lines being tested; the time and duration of the tests; the manholes where the flows are monitored; the observed presence, concentration and travel time of the dyed water to the flow monitoring manholes; and the soil characteristics.

Determining Conditions Caused by Streams or Ditch Sections

1. Plug or dam stream sections, ditch sections or ponded areas to be tested and fill to desired level with dyed water. Bypass flow around the section under test if necessary.
2. Follow steps 3 through 5 above.

Identifying Sources on Private Property

1. Notify property owners and receive permission for testing in advance of testing.
2. Insert dyed water into suspected inflow source and monitor closest downstream sanitary sewer manhole for evidence of dyed water.
3. Record the date of the test; address and type of the inflow source; duration of the test; the manholes where the flows are monitored; and the observed presence, concentration and travel time of the dyed water to the flow monitoring manholes.

Identifying Structurally Damaged Manholes

1. Flood the area around suspected manholes with dyed water.
2. Monitor manhole frame, chimney, cone and manhole walls for entry of dyed water.
3. Record the date of the test; manhole number; duration of the test; and the observed presence, concentration and travel time of the dyed water into the manhole.

Verifying Sources Found by Other Testing Means

1. Notify property owners and receive permission for testing in advance of testing if performed on private property.
2. Flood the area where visual survey or smoke testing study revealed potential I/I source. It may be necessary to restrict runoff from the area with sand bags to allow the area to become saturated.
3. Monitor the next downstream manhole in the sanitary sewer system for evidence of dyed water.
4. Measure the flow in the sanitary sewer manhole before and during dye testing. As an alternative, measure flow simultaneously at both the upstream and downstream sanitary manholes during the test.
5. Record the location of sources being tested, including address if on private property; the time and duration of the tests; the manholes where the flows are monitored; the observed presence, concentration and travel time of the dyed water to the flow monitoring manholes; and the soil characteristics.

- A field log shall be filled out for all dye tests that are performed, regardless of whether a positive transference to the sanitary sewer is observed. A sketch of each testing setup shall be prepared showing testing location, manholes checked, dye transference information, and flooding time. The sketch shall also include the date and time of the test and the names of personnel. A photograph of each testing setup shall be taken and numbered. Photographs of the testing setup shall be referenced on the setup sketch. The appropriate agencies shall be notified of impending dye testing prior to test commencement.

POTENTIAL EDMONDS IMPACTS

- Obtaining required permits for handling and disposal of test water volumes.
- Obtaining and appropriately disposing of test water volumes.
- Cost for additional staff workload, or contract with outside vendor.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Property owners need to provide permission to perform testing on private property.
- Some disturbance to yards/landscaping could occur during testing.

DESIGN

TITLE: Design Capacity for Pipeline Rehabilitation Projects

STANDARD NO. S-8

I/I CONTROL MEASURE ISSUE:
Many pipeline rehabilitation techniques for I/I control involve some loss in the hydraulic capacity of the system because the technique reduces the effective internal diameter of the pipe. Hydraulic capacity loss can range from moderate for techniques such as CIPP to high for techniques such as sliplining. Surcharging and sanitary sewer overflows can result if the hydraulic capacity is reduced below the required service capacity of the line.

STANDARD

- The design of pipeline rehabilitation projects for I/I control shall consider any loss in the hydraulic capacity of the system resulting from a decrease in the effective internal diameter of a pipeline. A Professional Civil Engineer shall verify that the rehabilitated pipe maintains the required hydraulic capacity to service peak demand flow projections for the area tributary to the pipeline.

POTENTIAL EDMONDS IMPACTS

- The City will need to verify that the project designer has addressed the hydraulic capacity of the pipeline.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impact.

TITLE: Sewers on Steep Slopes

STANDARD NO. S-9

I/I CONTROL MEASURE ISSUE:
Pipe that is installed on steep slopes is more susceptible to movement, breakage, and slipped joints, which may allow I/I into the system. Special measures to anchor pipes installed on steep slopes may be required depending on the stability of the existing soils, local groundwater conditions, and the quality of the bedding and backfill construction during pipe installation.

STANDARD

- Sewer mains on steep slopes shall be designed by a Professional Engineer to ensure the integrity of the system to prevent leakage and minimize I/I.

POTENTIAL EDMONDS IMPACTS

- Verify that a Professional Engineer has addressed pipe anchoring requirements on steep slopes.
- Additional cost for pipe anchors that are typically a requirement on steep slope pipeline installations.
- Inspectors will need to verify that anchors are installed as designed.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impact.

TITLE: Manhole Location and Covers

STANDARD NO. S-10

I/I CONTROL MEASURE ISSUE:

Placement of manholes is important for two reasons:

- the potential for I/I will decrease by not placing it in a location subject to surface water flows or ponding
- proper location can improve the City's ability to inspect and maintain the system, thus reducing I/I.

When manholes must be placed in areas subject to surface water flows, inflow can be prevented by providing a watertight frame and cover system.

STANDARD

- Manholes shall not be installed in areas subject to surface inundation such as pavement depressions and gutters. If this cannot be avoided, then the entire manhole, including cover, shall be designed as a watertight system. Buoyancy of the watertight manhole shall be accounted for in the design. For manholes placed in lakes or ponds a special watertight manhole, including access system, shall be designed to prevent leakage and to insure maintainability.
- For manholes located in paved roadways, parking lots, or other areas that become subject to channelized stormwater flow due to re-grading, the manhole shall be retrofit with a watertight frame and cover system to prevent inflow.
- Watertight frame and covers shall consist of a solid, gasketed cover or an approved manhole cover insert that stops the inflow of surface water into the manhole. Manhole cover inserts may be installed beneath a standard cover. Manhole cover inserts shall be in conformance with Standard Detail MH-3.

POTENTIAL EDMONDS IMPACTS

- Added cost for watertight design in areas that may not now be required to be watertight.
- Sewer system plan review would need to include an assessment of locations where manhole cover inserts are required.
- Field inspection to ensure watertight manhole covers are installed where specified would be required.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Potentially higher ratepayer cost for watertight design.

TITLE: Manhole Size

STANDARD NO. S-11

I/I CONTROL MEASURE ISSUE:
Providing a watertight seal at pipe penetrations is difficult when new or existing manholes are too small to accommodate all penetrations for incoming and outgoing pipes. Provisions to provide a minimum distance between manhole knockouts and minimum manhole sizes based on pipe size ensure a watertight pipe connection can be made and help prevent structural failure of the manhole.

STANDARD

- New manholes shall be sized so that the minimum distance between knockouts is in accordance with the requirements of the WSDOT/APWA Standard Specifications and the manhole manufacturers' standards. A connection detail stamped and signed by a Professional Civil Engineer and approved by the manhole manufacturer shall be provided where the minimum distance between openings cannot be maintained.

POTENTIAL EDMONDS IMPACTS

- Review of manhole shop drawings is required to ensure that the minimum sizing and spacing requirements are being met, or that a connection detail prepared by a Professional Engineer is being provided.
- Manhole construction costs may increase moderately if the City has previously allowed contractors to make connections to existing manholes or size new manholes without requiring the specified minimum sizes or distance between knockouts and adjacent pipe connections.
- Inspection of manhole construction is required to insure that the pipe locations and connections are as detailed and not field modified.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Potentially higher ratepayer costs if the City has not previously required minimum distances between knockouts.

TITLE: Sewer System Design

STANDARD NO. S-12

I/I CONTROL MEASURE ISSUE:

Structural failure of pipe and manholes can lead to infiltration of groundwater. The following key factors contribute to the impairment of a sewer system's structural abilities, resulting in I/I:

- Sewer mains, manholes, laterals and side sewers that are not properly supported are subject to vertical displacements over time, causing joints to open and pipeline trenches to settle, producing cracks or breaks in sections of the pipe.
- Materials must be appropriate for design conditions and the ground conditions present. Pipeline failures often occur due to the misuse of materials.
- Deep cuts and poor ground conditions often result in a larger than necessary excavation, leading to unequal settlement if uniform support is not provided for the pipe and manhole. Inadequate support often causes failure of the pipe in shear at the manhole and provides a point of entry for groundwater.

Recognizing past situations that have allowed extraneous flows to enter the system and requiring sound and appropriate design measures to prevent these deficiencies on future projects can greatly reduce future I/I.

STANDARD

- Sewer system design shall be performed by a Professional Civil Engineer licensed in the State of Washington. The designer shall verify that sound and appropriate standards and measures have been employed in the design of new sewer systems. This shall include the choice of sewer materials for the design conditions, pipe bedding and backfill requirements, and the evaluation for pipe casing requirements.

POTENTIAL EDMONDS IMPACTS

- The City will need to verify that the designer has adequately addressed elements of the sewer design that relate to the structural integrity of the system.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impacts.

CONSTRUCTION & INSPECTION

TITLE: Manhole Joints

STANDARD NO. S-13

I/I CONTROL MEASURE ISSUE:
Joints in manholes present potential sources of I/I from the precast concrete manhole segments, adjustments rings and pipe penetrations.

STANDARD

- All manholes shall be completely watertight from the top of the casting down.
- Manholes materials and construction shall be in accordance with WSDOT/APWA Standard Specifications except as modified by this standard and Standard Details MH-1 and MH-2.
- Precast concrete manhole sections shall be joined with either rubber or flexible plastic gaskets.
- All lifting holes shall be completely filled with non-shrink grout.
- Typical pipe penetrations through precast concrete sections shall be either factory knockouts or core drilled (not line drilled or rough broken) cutouts. Pipe shall enter the manhole through a rubber gasketed entry coupling specifically design for a flexible, watertight connection either cast into the manhole section or grouted in place with non-shrink grout.
- Where a new manhole is being constructed as a “saddle manhole”, which is built around an existing sewer main, the manhole shall be designed by a Professional Civil Engineer. The saddle manhole shall be of sufficient diameter to provide a watertight connection between the manhole and the wall of the existing pipe.

POTENTIAL EDMONDS IMPACTS

- No major impact because the City currently meets this standard.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impacts.

TITLE: Side Sewer Connection Location and Taps

STANDARD NO. S-14

I/I CONTROL MEASURE ISSUE:
The location of a side sewer connection to a mainline in an area with difficult access or in such a manner as to induce unnecessary stress on the system can make it more prone to damage and less apt to be maintained, thus resulting in I/I. Good construction techniques and proper selection of materials for side sewer taps can reduce I/I by protecting the mainline from damage by providing a watertight seal.

Standard

- No side sewers shall be connected to a main located in a lake or similar body of water except under special circumstances.
- If a side sewer must be connected at a manhole, then it shall penetrate the manhole wall through a watertight rubber gasketed factory manhole adapter specially designed for the side sewer material type. A mortared connection at a manhole will not be permitted unless the structure is constructed as a saddle manhole.
- All connections to existing mains shall be made at an existing tee fitting or by core drilling a hole in the existing sewer main and installing an approved gasketed factory sewer saddle or cutting in a gasketed factory tee. The City of Edmonds may consider other connection alternatives if the method can be demonstrated to provide a watertight connection. Line drilling or rough breakouts shall not be used.
- For a tapped connection to the mainline, the hole shall be as small as possible to accommodate the outside diameter of the side sewer pipe with adequate space for minor angle alignment adjustments of the side sewer. The connection shall be made with a factory saddle specifically designed for side sewer connections and fabricated of corrosion resistant materials and mechanically attached to the pipe to withstand the anticipated loads. The saddle shall provide a rubber gasketed joint between the sewer main and the saddle.
- Factory tees shall be appropriate for the soil conditions encountered in the connection location and shall have rubber gasketed joints. Material selection shall take into account the soil corrosistivity, compatibility of materials with the existing pipe, strength requirements, and bedding/backfill conditions. The tee shall be connected to the existing sewer main pipe by short sections of plain end pipe and an approved stainless steel repair clamp. The short sections of pipe shall match the sewer main pipe material and shall meet or exceed the strength of the existing system. Stainless steel repair clamps shall be gasketed, with a minimum length of two pipe diameters, and assembled with all stainless steel bolts and nuts.

Potential Edmonds Impacts

- Inspection requirements to confirm compliance with standards or do tap itself.
- Moderate cost of using saddles.
- High cost of using cut in tees and dealing with active sewer line.

Potential Private Property/Ratepayer Impacts

- Higher ratepayer costs for using tees.

TITLE: Abandonment Requirements

STANDARD NO. S-15

I/I CONTROL MEASURE ISSUE:
Abandoned sewer pipes and manholes that are not completely isolated from the remaining system pose potential sources for I/I. Abandoned sewer mains are defined as any section of pipe extended beyond a manhole with no services attached and no plan for future extension or service connection(s). Abandoned side sewers fall into two categories. If no future connection is anticipated, then the entire side sewer from the main is considered abandoned. If a future connection is anticipated, then the side sewer shall be considered abandoned at the property line.

STANDARD

- Manholes: Manholes shall not be abandoned if they are on the end of an active sewer main. If the manhole is part of an abandoned pipe system, then it shall be completely filled and all pipes physically connected to the manhole shall be plugged.
- Sewer Main Pipe: Abandoned sewer main pipes shall be plugged with a minimum of length of 3 pipe diameters with a non-shrink grout or other impermeable material at the manhole. The pipe shall be prepared to provide a watertight bond between the plug material and existing pipe.
- Sewer Main Abandonment Inspection: The plug shall be visually inspected for any leaks during the wet season while under warranty.
- Side Sewers: Abandoned side sewer pipe shall be capped with a watertight plug for future use or plugged with a minimum of length of 3 pipe diameters with a non-shrink grout or other impermeable material. The pipe shall be prepared to provide a watertight bond between the plug material and existing pipe.
- Side Sewer Abandonment Inspection: Plugged side sewers shall be CCTV inspected for leakage at the sewer main connection during the wet season while under warranty.

POTENTIAL EDMONDS IMPACTS

- Inspection requirements to confirm that the work was done correctly.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Potentially higher ratepayer costs for increased inspection costs.

TITLE: Pipe Materials

STANDARD NO. S-16

I/I CONTROL MEASURE ISSUE:
Pipe breakage and joint failures may occur because of improperly selected side sewer/lateral pipe materials and/or installation procedures, resulting in infiltration. Proper selection of pipe materials and joint systems is an important component of side sewer design and construction that will result in reduced immediate and future infiltration.

Standard

- Side sewer/lateral pipe materials shall be selected based on external loading and soil corrosion potential. Pipe materials used shall have strength characteristics consistent with the earth load and surcharge conditions anticipated. Vehicle live loads, overburden, soil characteristics, and slope conditions shall be considered. Side sewers shall be installed below the frost line and at a depth consistent with the published load bearing capacity of the pipe material used. Pipe materials used shall have corrosion resistant characteristics consistent with the corrosivity of the environment in which they are to be installed.
- Side sewer/lateral pipe materials shall employ gasketed joints and standard manufactured fittings designed for use with the pipe material installed. Deflection of joints shall be limited to 80% of the published maximum deflection for the gasketed joint. Flexible pipe materials used shall be properly bedded and backfilled to ensure that deflection of the pipe beyond its structural capacity will not occur and that deflection "out of round" beyond the capability of the pipe joints to remain sealed does not occur.
- Connection between the side sewer/lateral and dissimilar building plumbing piping shall be accomplished using approved flexible water tight couplings specifically designed for the pipe materials joined. Butt joints wrapped and/or encased in concrete or mortar joint will not be allowed. Connection of pressure discharges from building plumbing to gravity side sewers/laterals shall be accomplished using standard pressure fittings and shall be anchored to ensure against movement during pressurization cycles.

Potential Edmonds Impacts

- Site inspection of side sewer/lateral material and joint installation insuring requirements are met.
- Additional inspection and review time would be required if the City is not currently inspecting side sewer installations and reviewing material submittals.
- Integrity of the installed pipe material and joints must be determined through water, air, or vacuum testing (see testing standards). Testing to confirm integrity of side sewers/laterals should be required prior to acceptance of the installation following construction and following a one-year warranty period.

Potential Private Property/Ratepayer Impacts

- May be added costs to property owner/developers if their practices change due to standards for pipe material and joint systems being more strictly enforced.

TITLE: Pipe Rehabilitation Methods

STANDARD NO. S-17

I/I CONTROL MEASURE ISSUE:
Once the decision has been made to rehabilitate a sewer to control I/I, several alternatives may be used to replace the existing sewer. These include trenchless rehabilitation techniques such as cure-in-place lining or pipe bursting, as well as conventional dig and replace. An evaluation should be made to determine suitability (technical and cost-effectiveness) of trenchless methods versus conventional dig and replacement of the sewer. The technical evaluation should assess specific issues such as the sewer location, alignment, condition of the pipe being replaced, and future service requirements for the sewer. If the rehabilitation technique will reduce the cross sectional flow area of the pipe the technical evaluation should consider loss in hydraulic capacity of the line in accordance with the I/I Capacity for Pipeline Standard S-4. The alternative pipe rehabilitation methods that should be considered include:

Pipe bursting is a trenchless pipeline rehabilitation method that can be used to replace sewer pipes. It is possible to increase the size of the pipe; however, site specific constraints may limit the ability to increase the size. Using pipe bursting to replace a pipe may be restricted depending upon adjacent utilities, proximity to a road surface, the type of existing pipe being replaced, and soil conditions. There are a number of variations on pipe bursting such as pneumatic, hydraulic expansion, and static pull systems. All of these displace the old pipe into the adjacent ground and pull a new pipe in to replace the old pipe. There are also related processes such as pipe reaming, which is a variation of horizontal directional drilling, where pieces of the old pipe are removed rather than pushing them into the adjacent soil. Pipe bursting may be used for mainline, lateral, and side sewer repair. The most common pipe material used is HDPE but other types of pipe material such as cast iron, MDPE, and ABS can be used for the replacement pipe.

Cure-in-place pipe (CIPP) liner is a trenchless pipeline rehabilitation method that can be used to repair existing sewer pipes. CIPP liner involves inverting an epoxy-resin-impregnated flexible tube into an existing line using hydrostatic head. The resin is then cured using heat to produce a pipe inside the existing pipe. The outside diameter of the replacement pipe is smaller than the existing pipe to allow the system to be installed. Capacity in the pipeline will be reduced because of the reduction in pipe size.

Slip lining is a trenchless pipeline rehabilitation method that can be used to replace sewer pipes. Slip lining involves pushing or pulling a replacement pipe into an existing pipe. The outside diameter of the replacement pipe is smaller than the inside diameter of the existing pipe to allow the replacement pipe to be installed. Capacity in the pipeline will be reduced because of the reduction in pipe size. A variety of pipe materials may be used for slip lining including HDPE, ductile iron, PVC, concrete and fiberglass. The annular space should be grouted unless there are project specific reasons to do otherwise.

Fold and form lining is a trenchless pipeline rehabilitation method that can be used to repair existing sewer pipes. The fold-and-form process involves inserting a heated PVC or HDPE thermoplastic liner, folded or deformed into a U-shape, into an existing sewer and re-rounding the liner using heat and pressure to produce a pipe inside the existing pipe. The outside diameter of the replacement pipe is smaller than the existing pipe to allow the system to be installed. Capacity in the pipeline will be reduced because of the reduction in pipe size.

Standard

- Construction standards for pipe bursting, cure-in-place lining, slip-lining and folded and formed liners shall be as follows:
- Pipe Bursting:
  - Pipe bursting shall meet the requirements of the City's Inflow and Infiltration Control Program Guide Specifications.
- Cure-in-Place Lining:
  - Cure-in-place-lining shall meet the requirements of the City's Inflow and Infiltration Control Program Guide Specifications.
  - Service connections to the new lined pipe shall be made water tight by grouting the area where the service connection enters the lined pipe or by installing a service connection rehabilitation liner in conformance with the City's Inflow and Infiltration Control Program Guide Specifications.
- Slip Lining:
  - Slip lining shall conform to ASTM F585-94 – "Standard Practice for Insertion of Flexible Polyethylene Pipe Into Existing Sewers".
  - The type of replacement pipe used shall meet or exceed the requirements for sewer pipe materials in I/I Pipe Materials Guideline G-6Standard and shall be suitable for the slip lining process being used.
  - New pipe connections to manholes shall provide a water tight connection suitable for the type of replacement pipe being used and in accordance with the I/I Connections to Existing System Standard S-2. Acceptable manhole connections may include commercially available manhole connection boots or the pipe grouted into the manhole pipe penetration with a seep ring on the pipe.
  - Lateral connections to the new pipe shall also be made using commercially available fittings suitable for the type of replacement pipe. For HDPE pipe, lateral wyes or tees shall be made using manufacturer provided fusion welded fittings or other City-approved fittings specifically manufactured for HDPE pipe.
  - The annular space shall be grouted unless there are project specific reasons to do otherwise. Issues to be considered relative to the annular space grouting include grouting pressures and pipe restraint to prevent floatation.
- Fold and Form:
  - Fold and form-lining shall meet the requirements of the City's I/I Control Program Guide Specifications.

Potential Edmonds Impacts

- Inspection requirements to confirm that the trenchless rehabilitation is done correctly.

Potential Private Property/Ratepayer Impacts

- No impact.

TITLE: Inspection Wyes/Cleanouts

STANDARD NO. S-18

I/I CONTROL MEASURE ISSUE:
Pipe breakage and joint failures may occur during the service life of a side sewer pipe, resulting in infiltration. Installation of inspection wyes/cleanouts at the upstream end of the side sewer allows for the future preparation and inspection to identify infiltration problems and their specific sources.

STANDARD

- An inspection wye/cleanout shall be installed in each new and rehabilitated side sewer immediately down stream of the connection between the building plumbing outlet and the side sewer per Standard Detail SS-1. The inspection wye/cleanout shall meet the requirements of Standard Detail SS-4. Inspection wyes/cleanouts shall be installed no less than 2 feet and no more than 5 feet beyond the face of the building for new side sewer installations. For rehabilitation projects, the inspection wye/cleanout shall be located within 2 feet of the termination of the rehabilitation. Inspection wyes/cleanouts shall be located, to the greatest extent possible, to ensure CCTV accessibility in the future throughout the entire side sewer.
- When any work is done to rehabilitate a side sewer that involves excavating to expose and gain entry to the pipe outside of an existing inspection wye/cleanout, the entire side sewer from the property line to the building(s) must be upgraded to meet this standard.
- Connection of inspection wye/cleanout assemblies to the existing pipe system shall be made with an approved rubber gasketed pipe coupling.

POTENTIAL EDMONDS IMPACTS

- Inspection of inspection wye/cleanout installations to ensure that requirements are met. Documentation and record keeping to facilitate future location and use of the inspection wyes/cleanouts.
- Property access issues allowing use of inspection wyes/cleanouts by the City to assess condition of the side sewer/lateral in the future. May require side sewer permit/utility ordinance clause modifications.
- Additional administrative costs to initially record and maintain records of inspection wye/cleanout locations.
- Additional costs associated with permit language and/or ordinance modifications required to establish legal right for Edmonds to access inspection wyes/cleanouts on private property.
- Additional cost associated with ongoing program of periodic monitoring of side sewer integrity and performance using the inspection wyes/cleanouts.
- Inspection wye/cleanout testing will be accomplished integrally with the side sewer/lateral test.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Increased costs for added fittings and installation requirements, as well as inspections where standard requirements exceed current requirements
- Restrictions on development and landscaping required to maintain accessibility to inspection wye/cleanout in the future.

TITLE: Inspection of Pipe Installation and Backfill

STANDARD NO. S-19

I/I CONTROL MEASURE ISSUE:
Inspection of pipe and bedding materials including foundation conditions, pipe laying, bedding and backfill operations is necessary to ensure conformance with the required standards. A visual inspection of connections to the new main line should be performed to verify that no disallowed connections, such as from storm water collection sources, are being made to the system. Without adequate inspection, contractors may take construction shortcuts that result in a substandard pipeline installation.

Standard

- The City of Edmonds shall perform the following inspection activities on pipeline installations:
  - Inspection of foundation conditions in areas of questionable soils to verify whether over-excavation is required.
  - Visual inspection of pipe materials and bedding and backfill materials for conformance with standards.
  - Measurement of compaction and density for conformance with bedding and backfill standards.
  - Visual inspection of pipe laying operations to ensure pipe has full, uniform support, pipe-jointing process is being properly performed, and compaction operations are not damaging the pipe.
  - Visual inspection of service connections to the mainline and manholes to verify no surface water collection sources are being connected to the sanitary sewer system.
- A minimum of 10% of the pipe length for each project should be inspected as noted above.
- Above and beyond the minimum inspection, the City shall make the determination on the required frequency of the inspection based on the qualifications and quality of the contractor performing the work.

Potential Edmonds Impacts

- City will need the inspection resources to adequately cover sewer construction work occurring within the agency.
- Administrative costs for on-site inspection will increase if the City is not currently inspecting pipe installation and backfill operations.
- Inspection of pipe installation and backfill operations ensures installation according to the standards, resulting in a more long-lasting and dependable facility. In the long-term, proper inspection of critical pipeline installation operations can save future maintenance, rehabilitation and replacement costs.

Potential Private Property/Ratepayer Impacts

- Potential higher ratepayer costs where inspection is not currently being performed.

TITLE: Pipe Zone Bedding and Trench Backfill (Side Sewers)

STANDARD NO. S-20

I/I CONTROL MEASURE ISSUE:
Side sewers not laid in granular bedding material are subject to potential point loading and/or deflection over time, leading to subsequent damage to the pipe or pipe joint.

Standard

- Side sewer/lateral pipe zone bedding material shall provide uniform support along the entire pipe barrel, without load concentration at joint collars or bells. Bedding material shall be granular material meeting the requirements of Standard Detail S-1. The installed pipe zone bedding material shall effectively separate the side sewer from contact with the native ground and any rocks, pebbles, roots, or other materials that might impose a point load on the side sewer. The pipe zone bedding material shall extend a minimum of 4 inches beyond the outside dimension of the side sewer pipe in all directions. All adjustments to line and grade shall be made by scraping away bedding material or filling with bedding material under the body of the pipe and not be accomplished by blocking or wedging. Disturbed bedding shall be reconsolidated prior to backfill. Pipe zone bedding material shall be compacted to 95 percent maximum density per ASTM D-1557. Bedding shall be placed, spread, and compacted before the pipe is installed so that the pipe is uniformly supported along the barrel. Material shall be worked carefully under and around the pipe haunches and then compacted.
- Deviation from the installation requirements noted above is acceptable where written recommendations have been provided by the pipe manufacturer.

Potential Edmonds Impacts

- Site inspection of side sewer bedding and backfill material and installation will be required to insure that requirements are met.
- Additional inspection and review time would be required if the City is not currently inspecting side sewer installations and reviewing material submittals.

Potential Private Property/Ratepayer Impacts

- Potentially higher costs if builder/developer does not now use good practices in installing side sewers.
- Potentially higher permit costs for inspections and testing.

TITLE: Manhole Leveling Rings

STANDARD NO. S-21

I/I CONTROL MEASURE ISSUE:
The manhole grade-adjustment rings for the frame and cover can be a source of infiltration.

Standard

- Materials for grade adjustment of manholes shall consist of precast concrete rings specifically designed for the diameter of the manhole entrance and anticipated loads. Other materials for the rings may be considered provided they provide adequate support, are impermeable, provide a watertight seal, and have a serviceable life expectancy of 50 years or over.
- Adjustments of the frame and cover shall be made with precast concrete rings and joined with mortar meeting the requirements of Section 9-04.3 of the WSDOT/APWA Standard Specifications or flexible plastic/mastic gaskets. If leveling rings are used that are manufactured from materials other than concrete, the installation of the rings and adjustment to grade shall be in accordance with the manufacturer's recommendations.
- If mortar joints are used, consideration shall be given to infiltration leakage that could occur through the rings. This may include wrapping the full height of the exterior of the manhole rings with a membrane sealing system.
- Testing and inspection: If mortar joints are used, they shall be inspected before backfilling.

Potential Edmonds Impacts

- Additional cost of inspection and testing of the manhole.

Potential Private Property/Ratepayer Impacts

- No impacts.

TITLE: Root Intrusion

STANDARD NO. S-22

I/I CONTROL MEASURE ISSUE:
Pipelines that have roots protruding into the pipe have a breach in the piping system at a joint and/or a break in the pipe. This breach is a potential source for infiltration. Cutting of the roots inside the pipe and treatment with a root-inhibiting chemical will not remove infiltration. Root intrusion can cause operational problems by plugging the sewer and will likely need to be corrected to address this problem.

Standard

- When roots are found in sewer piping and manholes, the point of entry shall be located by CCTV. If infiltration occurs at the point of root intrusion it shall be evaluated for removal during the wet season when surrounding soils are fully saturated. Correction of infiltration caused by roots can be accomplished by performing a spot repair by either a conventional dig and repair or using a trenchless repair method.
- If the segment of sewer indicates potential for additional root intrusion, consideration shall be given to replacing the sewer using either dig and replace or trenchless methods.

Potential Edmonds Impacts

- Added cost to test and repair the entire section of main from manhole-to-manhole.

Potential Private Property/Ratepayer Impacts

- Added cost due to increased cost to maintain system.

TITLE: Root Intrusion (Side Sewers)

STANDARD NO. S-23

I/I CONTROL MEASURE ISSUE:
Side sewers that have roots protruding in the pipe have a breach in the piping system either at a joint and/or a break in the pipe. This breach is a potential source for infiltration.

STANDARD

- For any sewer system rehabilitation work on side sewers or laterals, root intrusion shall be addressed by evaluating removal of the roots and repair or replacement of the side sewer/lateral at the point of root intrusion.

POTENTIAL EDMONDS IMPACTS

- The costs of pipe repair will be incurred if the rehabilitation is financed by the City.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Pipe repair activities may cause inconveniences from service disruptions or construction activities.
- The cost of rehabilitation will be incurred if financed by the property owner.

TITLE: Pipeline Leak Testing

STANDARD NO. S-24

I/I CONTROL MEASURE ISSUE:
Several aspects of sewer main pipe installation, if not properly designed and constructed, may result in infiltration entering the finished pipeline. Leakage testing of the assembled sewer pipeline immediately following construction is one of the final opportunities for verification that the pipeline meets acceptable I/I criteria prior to being placed into service.

Leakage testing of newly installed replacement sewer mains may not be feasible because active side sewers are being installed on the new line as construction progresses. For these cases, CCTV inspection of the completed line will be required in lieu of a leakage test.

STANDARD

- Acceptance criteria for substantial completion following construction of new and rehabilitated pipelines shall include testing requirements to ensure that the sewer pipelines and connections to the sewer pipelines, as constructed, meet specified leakage limitations. Where new sewer mains can be isolated from active flow, the pipeline shall be tested by either a water test or a low pressure air test. For those cases where flow cannot be routed around the new main, the pipeline shall be CCTV inspected for leakage.
- The water test shall be an infiltration test if the sewer main is installed below the groundwater level. The water test shall be an exfiltration test if the sewer main is installed above the groundwater level. Testing shall be in accordance with the WSDOT/APWA Standard Specifications.
- Low pressure air testing shall conform to the requirements of the WSDOT/APWA Standard Specifications.
- Where wastewater flow cannot be routed around the new main as construction progresses, the pipeline shall be CCTV inspected for leakage. While under warranty, it is recommended that a visual inspection for leakage be performed during the wet season when surrounding soils are fully saturated.

POTENTIAL EDMONDS IMPACTS

- Possible additional cost and additional staffing requirements for acceptance and inspection verification.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Potentially higher ratepayer costs for increased visual inspection/verification requirements.

TITLE: Sanitary Side Sewer Inspection

STANDARD NO. S-25

I/I CONTROL MEASURE ISSUE:
A visual inspection of the private side sewer is needed before it is backfilled or covered to ensure that pipe materials meet specifications, the pipe is properly supported, and that storm water drains and subsoil drains are not connected to the sanitary sewer.

STANDARD

- No trench shall be filled nor any side sewer covered until the work has been inspected, tested and approved by the City of Edmonds. The City may require that any work covered be uncovered, or tested by a recognized independent testing laboratory (at the expense of the permittee), to ensure that the work has been accomplished in accordance with the permit.

POTENTIAL EDMONDS IMPACTS

- Inspection standards for private side sewers would need to include a provision for a visual inspection of each side sewer before it is backfilled or covered. Additional inspection effort would be required if the City is not currently inspecting each side sewer. City inspection forms should include verification of the visual inspection including date, time and the name of the inspector.
- Tighter coordination of inspection timing may be required.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Permit fees for side sewer installation could increase to finance inspection costs.

TITLE: Side Sewer/Lateral Leak Testing

STANDARD NO. S-26

I/I CONTROL MEASURE ISSUE:
Several aspects of side sewer/lateral pipe installation, if not properly designed and constructed, may result in infiltration entering the finished pipeline. Leakage testing of the assembled side sewer/lateral immediately following construction is the final opportunity for verification that the pipeline meets acceptable I/I criteria prior to being placed into service.

It is also beneficial to test side sewer/lateral pipelines after a significant period of service to confirm that as-built conditions have not degraded due to material failures, bedding or backfill settlement, or other causes.

Standard

- Acceptance criteria following construction shall include testing requirements to ensure that both new and rehabilitated side sewer/laterals and connections, as constructed, meet specified leakage limitations. All new side sewer/laterals shall be tested by either a water test or a low pressure air test.
- The water test shall be an infiltration test if the side sewer/lateral is installed below the groundwater level. The water test shall be an exfiltration test if the side sewer/lateral is installed above the groundwater level. Testing shall be in conformance with WSDOT/APWA Standard Specifications. The downstream end of the private side sewer/lateral shall be plugged to isolate the private side sewer/lateral from the public side sewer/lateral stub and the building plumbing when water testing methods are employed.
- Low pressure air testing shall conform to the requirements of the WSDOT/APWA Standard Specifications. The downstream end of the private side sewer/lateral shall be plugged to isolate the private side sewer/lateral from the public side sewer/lateral stub and the building plumbing when low-pressure air testing methods are employed.
- Where a rehabilitated lateral/side sewer cannot be water tested or low pressure air tested, the pipeline shall be CCTV inspected for leakage at its connection point to the sewer main. The inspection for leakage shall be performed during the wet season when surrounding soils are fully saturated.
- On publicly funded rehabilitation projects, additional testing at the completion of the warranty period to establish the continued integrity of the side sewer/lateral shall be required. Since water testing or low-pressure air testing of side sewer/laterals after they have been put into service is problematic, visual inspection using CCTV shall be conducted as the most effective practical testing method available for confirming that warranty requirements have been met.

Potential Edmonds Impacts

- Possible additional cost and additional staffing requirements for acceptance and warranty testing verification.
- Possible additional construction cost to account for acceptance and warranty testing requirements.
- Potential additional cost to conduct CCTV Inspection and /or review inspection data at the end of the warranty period.

Potential Private Property/Ratepayer Impacts

- Increased permit costs for added testing requirements, as well as inspections, where standard requirements exceed current requirements.

TITLE: Manhole Leak Inspection

STANDARD NO. S-27

I/I CONTROL MEASURE ISSUE:
Several aspects of sewer manhole installation, if not properly designed and constructed, may result in infiltration entering the finished sewer system. Leakage inspection of the assembled manhole during the first wet season following construction is the best opportunity for verification that the manhole meets acceptable I/I criteria prior to being placed into service.
A final visual inspection for manhole leakage to confirm that as-built conditions have not degraded due to material failures, bedding or backfill settlement, or other causes needs to be performed at the end of the warranty period.

STANDARD

- Acceptance criteria following construction on new and rehabilitated manholes shall include a visual inspection to ensure that the manholes and connections to the manholes, as constructed, are watertight. Groundwater level shall be allowed to return to its normal elevation before performing the inspection. It is recommended that the visual inspection for manhole leakage be performed during the wet season when surrounding soils are fully saturated.

POTENTIAL EDMONDS IMPACTS

- Possible additional cost and additional staffing requirements for visual inspections.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Potentially higher ratepayer costs for increased inspection requirements.

TITLE: Product Specific Inspection

STANDARD NO. S-28

I/I CONTROL MEASURE ISSUE:
Products used in sewer system construction for both new and rehabilitation improvements can fail and lead to I/I due to improper installation and/or the use of non-specified products being installed. Without inspection, there are no assurances the product installed is the one specified and installed properly.

Standard

- Product inspection is the visual verification of product test results and/or confirmation that an approved product is the one being installed, and that the sequence of construction or application is appropriate. Verify the approved product is being installed in accordance with approved specifications. This includes pipe, fittings, bedding, and rehabilitation products. It is important to distinguish the difference between inspection and testing. Those products covered under the testing standard shall have those tests performed to verify compliance.
- Pipe shall be inspected at the point of installation to verify that it has factory markings identifying the type and class of pipe. Unlabeled products will not be approved for installation.
- Pipe fittings shall be inspected at the point of installation to confirm they meet the specifications.
- Pipe bedding material shall be inspected at the time of installation to be appropriate for the type of pipe (flexible or rigid).
- For rehabilitation products, the manufacturer's recommended installation procedure shall be reviewed prior to installation. An installation list with references shall be provided documenting recent projects where the product has been installed. Contact references and document the installation and operational experiences with the product. Conduct any additional investigations determined necessary for approval of the product and installation. If through this review the product appears acceptable, the installation requirements shall be documented from the review process along with any testing requirements of the installation.

Potential Edmonds Impacts

- Added cost for increased inspection.
- Additional qualification investigation for proposed rehabilitation products.

Potential Private Property/Ratepayer Impacts

- Potentially higher ratepayer costs where product specific inspection is currently not being performed.

TITLE: Product Specific Inspection (Side Sewers)

STANDARD NO. S-29

I/I CONTROL MEASURE ISSUE:
Side sewer system products in both new and rehabilitation improvements can fail and lead to I/I due to improper installation and/or non-specified products being installed. Without inspection, there are no assurances the product installed is the one specified and was installed properly.

Standard

- Product inspection is the visual verification of product test results and/or confirmation that an approved product is the one being installed, and the sequence of construction or application is appropriate. All products being installed shall be inspected to verify the approved product is being installed in accordance with approved specifications. This includes pipe, fittings, bedding, and rehabilitation products. It is important to distinguish the difference between inspection and testing. Those products covered under the testing standard shall have those tests performed to verify compliance.
- Pipe shall be inspected at the point of installation to verify that it has factory markings identifying the type and class of pipe. Unlabeled products will not be approved for installation.
- Pipe fittings shall be inspected at the point of installation to confirm they meet the specifications.
- Pipe bedding material shall be inspected at the time of installation to confirm the material is appropriate for the type of pipe (flexible or rigid).
- For rehabilitation products, the manufacturer's recommended installation procedure shall be reviewed prior to installation. An installation list with references shall be provided documenting recent projects where the product has been installed recently. The Edmonds shall contact references and document the installation and operational experiences with the product, and conduct any additional investigations determined necessary for approval of the product and installation. If through this review the product appears acceptable, the installation requirements shall be documented from the review process along with any testing requirements of the installation.

Potential Edmonds Impacts

- Added cost for increased inspection.
- Additional qualification investigation for proposed rehabilitation products.

Potential Private Property/Ratepayer Impacts

- Potential for increased inspection costs.
- Possible extension of construction schedule to accommodate inspection requirements.

TITLE: CCTV Inspection

STANDARD NO. S-30

I/I CONTROL MEASURE ISSUE:
Television inspection of newly installed and rehabilitated sewers provides documentation of lateral connections, confirms pipe joints are properly pushed home, and identifies infiltration and internal defects.

STANDARD

- A complete internal television inspection shall be performed on newly installed and rehabilitated sewers. An audio-visual digital recording of the inspection, compatible with the City of Edmonds's existing audio-visual format, shall be retained by the City. The television inspection shall be conducted following trench backfill and compaction, cleaning and testing. Groundwater level shall be allowed to return to its normal elevation before performing the inspection.

POTENTIAL EDMONDS IMPACTS

- Additional camera equipment and inspection time would be required, unless contracted with an outside vendor.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Television inspection of the lateral ensures there are no internal defects, potentially reducing future private property owner maintenance requirements due to improper installation.
- Potentially higher ratepayer costs for increased CCTV inspection requirements.

TITLE: CCTV Inspection (Side Sewers)

STANDARD NO. S-31

I/I CONTROL MEASURE ISSUE:
Television inspection of newly installed and rehabilitated side sewers provides documentation of connections, confirms pipe joints are properly pushed home, and identifies infiltration defects and inflow sources.

STANDARD

- A televised inspection of the connection of new and rehabilitated lateral/side sewers to the sewer main shall be performed where the lateral/side sewer cannot be pressure tested. An audio-visual digital recording of the inspection, compatible with the City of Edmonds's existing audio-visual format, shall be retained by the City. If camera access through a lateral test wye cannot be provided, the video camera equipment shall have a separate side-casting camera that allows inspection of the lateral. The television inspection shall be conducted following trench backfill and compaction, cleaning and testing. If dewatering was required for side sewer installation, the groundwater level shall be allowed to return to its normal elevation before performing the inspection.

POTENTIAL EDMONDS IMPACTS

- Additional inspection time to CCTV the lateral/side sewer and connection would be required, unless contracted with an outside vendor.
- Equipment costs for new CCTV camera equipment capable of inspecting lateral/side sewers may be required, unless contracted with an outside vendor.
- An increase in lateral/side sewers costs will result if the City is currently not requiring the contractor to perform CCTV inspections.

POTENTIAL PROPERTY OWNER/RATEPAYER IMPACTS

- CCTV inspection requirements will increase the total cost of lateral/side sewer installations.

WARRANTY

TITLE: Certification, Warranty and Qualifications

STANDARD NO. S-32

I/I CONTROL MEASURE ISSUE:
Some new construction and/or rehabilitation products or application systems may not have a proven track record of performance, yet offer attractive benefits or low costs which merit their use. A product specific certification can be used to protect the City of Edmonds's investment.

Every construction or rehabilitation project requires a period within which defects in construction or materials should be allowed to become evident before the contractor, supplier or manufacturer ceases to have responsibility for the project. A stipulated warranty length can be used to protect the City's investment. Conventional construction products and methods should be warranted for a period of at least one year. Unconventional or newer products and methods could be warranted for a longer period, from 2 to 5 years, as determined by the City's Engineer.

A formal procedure for qualifying a manufacturer or contractor can be used to protect the City's investment. Qualifications information to be supplied during bidding may include a summary of the firm's history, itemization of a number of recent, similar projects with descriptions, amounts, names and experience of specific firm representatives, and names/phone numbers of owner references.

It is vital that the certification, warranty and qualification requirements and procedures be fully described in the contract documents to be enforceable with the contractors and suppliers.

STANDARD

- When a new construction and/or rehabilitation product or application system does not have a documented record of comparable prior successful installations, the supplier of the product or system shall be required to provide certification that the product or system will perform as specified.
- The certification shall provide for the complete replacement of the product or system by the contractor if the product or system is found to be defective when installed or applied by a certified agent of the manufacturer.
- Each new construction and/or rehabilitation project shall include a warranty period of at least one year. Longer periods may be stipulated as determined by the City of Edmonds based on the nature of the work.
- Testing requirements at the end of the warranty period shall be consistent with those used to determine initial project acceptance.
- The City of Edmonds may determine that specific qualifications for the manufacturer or contractor be included in the evaluation of bids received.

POTENTIAL EDMONDS IMPACTS

- Staff or consultant Engineer will need to spend time to research and develop a certification period as well as a means for determining compliance.
- Verification of certification requirements during the submittal process will be required.
- Inspection during construction to monitor installation/application will increase staffing requirements.
- Follow-up time by staff to monitor product or system performance may delay project completion and may increase staff requirements.
- Potential for additional project cost by manufacturer or contractor.
- Staff or consultant Engineer needs to determine appropriate qualification procedures.
- Staff or consultant Engineer needs to determine appropriate length of warranty period.

❖ Legal and engineering effort to establish acceptable pre-qualification requirements will be greater. ❖ Additional engineering and legal costs during design and bid periods are likely to occur.
POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS ❖ Potentially higher ratepayer costs for certifications and longer warranty periods.

TITLE: Bonding and Warranty Inspection

STANDARD NO. S-33

I/I CONTROL MEASURE ISSUE:
One critical element of a warranty is verification of the improvement prior to the end of the warranty period so that construction deficiencies can be accomplished and paid for via the performance bond. Thus the system can be repaired and I/I eliminated.

STANDARD

- A warranty period shall be established on publicly funded projects for each side sewer project, or for each project containing a side sewer construction component. This warranty period shall be a minimum of one year in length.
- All side sewer pipes shall be CCTV inspected after 80% of the warranty period has expired but before the end of the warranty period. Defective portions of the system shall be repaired to meet all applicable I/I standards.
- A written record shall be made of acceptance of the improvement with the date and results of the inspections and testing. This shall be submitted to the City of Edmonds prior to release of the performance bond.

POTENTIAL EDMONDS IMPACTS

- Additional CCTV inspection and enforcement of the warranty.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Potential of added costs for inspections and verifications.
- Possible schedule delay to allow for verifications.

PUBLIC EDUCATION

I/I CONTROL POLICY ISSUE: **Community Education and Involvement –**

The I/I Control Program will result in the expenditure of public funds. There will be an array of inquiries, complaints, questions and suggestions from the general public, ratepayers, tenants and property owners. The manner in which these are tracked and resolved will have a major impact upon the public perception of the I/I Control Program. For acceptance as a necessary public program, members of the public will need to understand the purposes of the program, and its benefits to the community and to individual property owners and rate payers.

POLICY 1

The City of Edmonds shall create and promote educational programs to introduce the general public to I/I as an issue, to explain the potential benefits from I/I mitigation efforts, and to inform the public of their responsibilities related to the I/I problem. Educational/informational materials shall be designed to present issues in a format suitable for use by the general public. Materials prepared for King County's Regional I/I Control Program may also be utilized.

Explanation

- Public education is key to successfully addressing I/I from private property.
- The public's knowledge about storm and sanitary sewer systems and, in particular, I/I issues, is limited. Generating understanding of a program of this complexity is necessary in order to gain public support.
- An education program would explain the benefits of I/I reductions to:
  - the county-wide sewer system
  - the costs and benefits to the public, and
  - the benefits to private property owners.
- A central clearinghouse operated by King County is anticipated that would establish and publicize educational programs. Its operation is intended to help establish and maintain system-wide policies and standards.

Potential Edmonds Impacts

- The City could establish its own program or utilize the King County clearinghouse (once established).
- Using trained customer service representatives who use consistent approaches would buffer the City from dissatisfied individuals.
- It would allow for the wide distribution of contact information for I/I projects.

Potential Private Property/Ratepayer Impacts

- An awareness that changes in managing sewer and storm water are about to take place.
- Materials can be carefully tailored to areas with problems and geared to specific Edmonds needs.
- Ongoing Public Education – In order to maintain the rehabilitated sewer system, the property owner will need to be reminded of the importance of keeping major landscaping and buildings out of the utility maintenance easement area.
- Interested parties would not have to search for whom to contact regarding the work to be, or being, done on their property. It might reduce the frustration of dealing with a "bureaucracy". On the other hand, those who continue to be dissatisfied may turn to local political representatives or agency managers for more satisfactory relief.

I/I CONTROL POLICY ISSUE:	**Community Relations – Specific Project** **Community Education and Involvement**

I/I reduction projects will disrupt public and private property. There will be an array of inquiries, complaints, questions and suggestions from the general public, ratepayers, tenants and property owners. The manner in which these are tracked and resolved will have a major impact upon the perception of the I/I Control Program. For acceptance of specific I/I reduction projects, members of the public need to understand the purposes of the project, its benefits to the community and to individual property owners**.**

POLICY 2

For each specific I/I reduction project, the City of Edmonds shall be responsible for community education/involvement.

Explanation

- The City needs to be responsible for community relations, since it is most familiar with the specifics of the project and most aware of community concerns.

Potential Edmonds Impacts

- The City would implement the local design and implementation of project-related educational and community involvement material.
- Public education will have to be carefully tailored to areas with problems.

Potential Private Property/Ratepayer Impacts

- Individuals might feel that their elected local representatives would be more understanding and sympathetic to their concerns since materials are geared to their specific needs by the City.
- If an individual disagreed with a staff member's decision, a local problem resolution process may be more convenient and familiar.

FINANCING

I/I CONTROL POLICY ISSUE:	**Public Funding and Scope of Work**

The extent of public intervention and assistance in reducing or eliminating I/I from private properties will be shaped by a series of public policy choices. Some of the choices, like incorporating extensive surface and sub-surface restoration of private property, may require a series of adjunct policies. Other approaches may require only minor modification of local codes and regulations.

POLICY 3

Public funding shall be considered for all phases of I/I mitigation work on privately owned property. Funded work should include elements such as: permits, investigation, inspection and testing, any modifications to the side sewer connections and laterals, connections to public systems, restoration of disturbed areas (including landscaping, sidewalks, driveways, and rights-of-way) and post-rehabilitation testing and enforcement. Environmentally infeasible &/or prohibitively expensive modifications should be considered for variances/waivers.

Explanation

- Because maintenance and operation of the sanitary sewer system is for the public health and welfare, ensuring the elimination (or major reduction of) excessive I/I is usually considered a legitimate use of public funds.
- This alternative focuses on all types of private property, including residential commercial, and industry.

Potential Edmonds Impacts

- Given the expenditure required for public funding of an extensive program, the I/I Control Program would probably be initiated in selected mini basins (or smaller areas) with excessive I/I flow rates and with cost-effective solutions.

Potential Private Property/Ratepayer Impacts

- Property owners in a selected area would have to participate in this program.
- Utility rates would increase to pay for the I/I mitigation work; although substantial grant funding could reduce the burden on the local rate base.
- With full funding, issues such as constructing the program to accommodate economic hardship (of specific individuals as well as for customer classes such as those with fixed and low-income) would not be necessary.

I/I CONTROL POLICY ISSUE: **Rates, Incentives & Surcharges**

An effective I/I Reduction Program will be a significant additional expense to the City. Equitable means for generating the necessary funds should be considered.

POLICY 4

The City of Edmonds shall develop a funding mechanism for the I/I Reduction Program that includes a combination of adjustment to rates, addition of surcharges and/or incentives to property owners.

Explanation

- If I/I reduction is found to be necessary for a large part of the City, a dedicated rate increase could be adopted.
- For areas where I/I reduction is necessary but infeasible due to issues such as areas prone to flooding, unstable slopes, or lack of a storm water conveyance system, a surcharge to ratepayers in the area could be adopted, and the funds utilized in other areas of the sewer system.
- Incentivized programs could be developed where property owners could be reimbursed for installing City-approved I/I reduction measures.

Potential Edmonds Impacts

- Council action required to authorize the funding mechanisms; commensurate City staff time to develop recommendations.
- City staff time and costs to develop and manage any incentivized programs.

Potential Private Property/Ratepayer Impacts

- Ratepayers would see increased costs reflecting the additional expense to the City.

I/I CONTROL POLICY ISSUE: **Cost Sharing**

An effective I/I Reduction Program will be a significant additional expense to the City. Equitable means for generating the necessary funds should be considered.

POLICY 5

The City of Edmonds shall develop a funding mechanism for the I/I Reduction Program that includes a combination of City revenues coupled with funding from local (LID) and State sources, such as grants and loans.

Explanation

- City and property owners in an area slated for an I/I Reduction project could share costs by means of a Local Improvement District or similar structure.
- City and State could share costs of an I/I Reduction project or projects using existing State grant/loan programs such as Public Works Trust Fund, Centennial Clean Water Fund, etc.

Potential Edmonds Impacts

- City staff time and expense participating in LID.
- City staff time and expense (or consultant) in preparing appropriate grant/loan applications and administering resulting funds per State requirements.
- City staff time and expense in working with State agencies to modify grant/loan program rules allowing for I/I Reduction projects, as required.

Potential Private Property/Ratepayer Impacts

- Cost to property owners could be mitigated by appropriate cost-sharing for project implementation.

I/I DISCHARGE SITE CONDITIONS

I/I CONTROL POLICY ISSUE: **Stormwater Drainage Ordinance**

If storm water is diverted away from the existing sanitary sewer system, then alternatives may need to be found for the diverted storm water. Property owners and the City of Edmonds may need new options for surface and ground water drainage management.

POLICY 6

Where I/I work on private or public property results in the diversion of storm water drainage, and there exists a storm water system, then the I/I work shall involve meeting the provisions of the City's current "storm water drainage" ordinances. Jurisdictional approval must be obtained.

EXPLANATION

- In areas with an existing public storm water management system, all drainage diverted from the sewer system could be discharged into the storm water system, provided that:
  - The jurisdiction controlling the public storm water system approves the connection; and
  - There are sound design options, capacity and gravity flow.

POTENTIAL EDMONDS IMPACTS

- The capacity of the storm water system would have to be evaluated and a determination made regarding these new loads. Portions of the storm water systems may have to be upgraded. The costs for engineering analysis and design, construction and connections may be significant. Grants from the County's Surface Water Utility or the Public Works Trust Fund might help defray the cost of new and/or expanded storm water systems.
- This policy assumes that public funds for the removal of I/I would pay for the permits, engineering and other expenses associated with connecting storm water to a public system.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- This will likely improve drainage and water intrusion problems for the affected homes and properties. The cost of the lines and connections to the storm water system will depend upon individual conditions.
- Potential increased storm water costs, including costs to connect to the storm sewer system.

I/I CONTROL POLICY ISSUE: **On-site Storm Drainage Management**

If storm water is diverted away from the existing sanitary sewer system, then alternatives may need to be found for the diverted storm water. Property owners and the City of Edmonds may need new options for surface and ground water drainage management.

POLICY 7

Where I/I work on private property results in the diversion of storm water and an adequate storm water system does not exist, then the private property owner bears responsibility for discharging the storm water drainage to an appropriate location.

Where I/I work on public property results in the diversion of storm water and an adequate storm water system does not exist, the City of Edmonds bears the responsibility for discharging the storm water drainage to an appropriate location.

EXPLANATION

- Connecting residential storm water systems to the public sewer system is illegal. Therefore, illicit connections should be removed.
- Properties with impermeable and semi-permeable surfaces have storm water drainage requirements. For example: most roofs and driveways, lawns and hard packed soils don't allow for storm water absorption, retention or evaporation. Alternative practices can be used to reduce or eliminate the need for off site storm water systems. For example:
  - Surface and ground water drainage can be collected and directed to location(s) on the property where the water can drain into the ground by means of an energy dissipation basin (French drain). The feasibility and effectiveness of such systems depend upon its design, lot size and topography, soil type and local area conditions. The complexity of energy dissipation basins will also depend upon local conditions and drainage requirements.
  - Poor maintenance can increase and exacerbate storm water problems. Tree limbs that overhang houses tend to increase the need for gutter and drain line cleaning/maintenance. Improper soil drainage at the perimeter of structures can increase basement and crawl space flooding.
  - Special landscaping practices can increase storm water absorption and retention.
  - Roofs with a planted sod layer can hold and evaporate storm water.
  - Driveways can be made out of porous pavers and other materials that allow for water absorption.
  - Rain barrels and cisterns can be used to recycle storm water for gardening and some domestic use.
  - Ponds can be used to hold and evaporate storm water.

POTENTIAL EDMONDS IMPACTS

- Design and construction review may be required. As a first measure, this could be a lower cost alternative for the City than side sewer repair. If properly designed, constructed and inspected, once in place, there would be little impact.
- Reduction of storm water flow into the sanitary and storm water system.

Potential Private Property/Ratepayer Impacts

- Appropriate management of storm water flow on private property could have direct benefits to the homeowners and the public sanitary and storm water systems, such as:
  - Proper use of on-site storm water management systems would likely result in dryer homes, basements and crawl spaces.
  - Dryer homes tend to have fewer problems with wood destroying organisms, mold and mildew. Dryer homes have longer lasting furnaces, roofing and interior surfaces.
  - Many of the defects that are likely to be found in such inspections have low cost and low impact solutions. Such on site systems usually don't require extensive digging or interference with decks or in-ground systems such as water lines or oil tanks.
  - When properly designed, they require a modest amount of maintenance.

I/I CONTROL POLICY ISSUE: **On-site Storm Drainage Management**

If storm water is diverted away from the existing sanitary sewer system, then alternatives may need to be found for the diverted storm water. Property owners and the City of Edmonds may need new options for surface and ground water drainage management.

POLICY 8

Where an I/I reduction project results in the diversion of storm water drainage (e.g., removal of illicit connections), and the modifications required to properly discharge the storm water are deemed to be infeasible &/or prohibitively expensive (for the property owner), consider giving the property owner a choice of disconnection of illicit connection or surcharge.

Explanation

- Connecting residential storm water systems to the public sewer system is illegal. Therefore, illicit connections should be removed. However, if re-routing the storm water drainage, to either a public storm water management system or another appropriate location is deemed infeasible &/or prohibitively expensive (for the property owner), the alternative of a surcharge may be offered.

Potential Edmonds Impacts

- If a property owner chooses to pay a surcharge, rather than to disconnect an illicit connection, utility rate revenue will increase.
- Additional administrative processes will be necessary.

Potential Private Property/Ratepayer Impacts

- A private property owner with an illicit connection may have the opportunity to reduce the cost of compliance.

PRELIMINARY ENGINEERING

I/I CONTROL POLICY ISSUE: **Contractor Qualifications**

A critical success factor for reducing I/I is to make sure contractors have experience using acceptable materials and skilled labor resources to perform construction and I/I rehabilitation of public sewer systems. One way to assure the qualifications of the contractors is through a review of their past performance and bonding and financial ability, and of the experience of their key supervisory staff. Contractor qualifications often become an issue during the selection process on public projects since the primary basis of award is "Low Bid".

POLICY 9

The City of Edmonds shall develop in the bid specifications specific minimum experience requirements for contractors to ensure that the contractor hired will have experience in the type of work they are to perform.

Explanation

- The ability to require contractors to meet certain minimum experience conditions can result in better I/I reduction projects.
- Prior experience with specialized sewer technologies is necessary to ensure correct handling and application of these technologies. Prior experience with construction such as tunnels, systems restoration/rehabilitation, and deep excavation is also necessary.

Potential Edmonds Impacts

- Assures higher quality work coupled with realistic bids and less chance for disputes.

Potential Private Property/Ratepayer Impacts

- Assurance of quality systems, lower potential for future repair/replacement.

I/I CONTROL POLICY ISSUE:	**I/I Reduction Projects – Permits**
Permits and conditions are usually required on I/I reduction projects. Responsibility for obtaining these permits can vary.	

Policy 10

The City of Edmonds shall obtain all permits feasible, including the SEPA, HPA, 404, or other State or Federally required permits. The contractor shall obtain permits as detailed in the specifications such as the building, road or utility, ROW use, &/or clearing and grading permits. The permits required to be obtained by the contractor shall be specifically listed in the bidding documents.

Explanation

- Several permits may be required for work on I/I reduction projects. Project environmental permits should be obtained by the City, while permits such as building, utility and ROW should be obtained by the contractor.

Potential Edmonds Impacts

- The City would be responsible for obtaining those permits not specifically related to construction as part of its administrative duties.
- Potentially higher program cost.

Potential Private Property/Ratepayer Impacts

- Permits and conditions associated with permits help assure that public concerns and issues are addressed and mitigated.

CONSTRUCTION AND INSPECTION

I/I CONTROL POLICY ISSUE: **Rehabilitation Planning and Oversight – Inspection and Testing**

Initial and follow-up inspection and investigation of the condition and installation of public sewer lines and private sewer and storm drainage connections is a key to ensuring that neither inflow nor infiltration is occurring. The type and extent of inspection and investigation could vary depending upon the focus, extent and the approach selected to remove I/I from privately owned property and public sewer lines.

POLICY 11

The City of Edmonds shall provide training opportunities on the I/I Control Program to its representatives. The training material will include a checklist of guidelines for best practices and the adopted I/I Control Standards, Procedures & Policies. The City's efforts should be coordinated with training provided by King County (as available) under its Regional I/I Control Program.

EXPLANATION

- Because inspections are such an integral part of controlling I/I from private property, specially trained staff would ensure that the inspections occur with consistency and uniformity.
- The inspections could include a variety of tasks, such as: checking all connections, testing all lines, verifying the functionality of on-site and/or off-site storm drainage management, and ensuring restoration of sidewalks, driveways and rights of way.

POTENTIAL EDMONDS IMPACTS

- Adequate staff time for training. Side sewer permits would be expanded to include the entire residential drainage system.
- Coordination between areas of responsibilities would be key, for example, building permits and sewer permits; inspectors and paving crews; sewer maintenance/storm water maintenance and inspectors; and inspectors and maintenance, engineering and CIP personnel.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- The property owner's contractor would remain responsible for ensuring work performed on private residential property meets code and has been "signed off" by the City's "I/I Control Inspector".
- The cost of this expanded inspection and testing service could be included in the City's base rate or within a newly created I/I rate component.

I/I CONTROL POLICY ISSUE:	**Post-Rehabilitation Management – Restoration**

Many of the private property I/I mitigation options can interfere with private property conditions, especially buildings, site work and landscaping. Restoration of these disturbed areas could be expensive and complicated. A poorly understood or badly managed restoration policy and program could lead to significant public distrust, concerns, and problems. A policy is required that outlines the roles, responsibilities and any limits on such restoration work.

POLICY 12

If confirmed by legal counsel.

The City of Edmonds shall establish a standard for property restoration before initiating any I/I work (including landscaping, sidewalks, and driveways). Public property restoration is governed by City of Edmonds codes and ordinances.

Options can include:

1 – "Restoration as near as possible to pre-construction condition"
2 – "Basing value on restoration to as near as possible to pre-construction condition, consider up front property owner payment with signed waiver"

Explanation

- Some amount of restoration of private properties would be part of the I/I reduction program.
- Prior to the start of any I/I work, the property would be inspected and photographed, and relevant improvements and conditions would be thoroughly documented.
- The public funds used for this purpose would compensate for all of the agreed-to restoration work or up-front payment in recognition of the public benefits derived from the I/I program.
- Since certain plant/vegetation types are not easily restored, a "restoration to pre-construction condition" standard is not always possible.
- Disagreements would use the preferred method as chosen from the alternatives under Policy 2.

Potential Edmonds Impacts

- A more complex program that recognizes the impact of the I/I program upon private property.

Potential Private Property/Ratepayer Impacts

- Impacted Property Owners – Depending on the choice made, property impacts could be small to large, but property owner would receive rehabilitated side sewer.
- Ratepayers – Increases the cost of the I/I Control Program and therefore might result in higher rates.

WARRANTY

I/I CONTROL POLICY ISSUE:	**Contractor Bonding, Licensing and Warranty**

POLICY 13

The City of Edmonds shall be responsible for ensuring that, for publicly funded I/I reduction projects, the construction contract includes appropriate bonding, licensing, insurance, and warranty provisions to ensure satisfactory completion of the project and warranty of the project for a sufficient amount of time (recommended minimum 12 months).

EXPLANATION

- Contractors for public projects must be licensed, bonded and insured. For publicly funded projects, agencies generally establish standards for contractor bonding, end of project retainage, and warranties that ensure the completed facilities will continue to function as intended for a reasonable period of time.
- A schedule of required contractor warranties would be established at the beginning of a project. For example, pipe performance would have a longer warranty requirement than pumps.

POTENTIAL EDMONDS IMPACTS

- A "retainage" could be required to be held back after "substantial completion" of the work. The retainage would be released once all punch list items have been completed and final inspections performed.
- Bonding, retainage and warranties reduce the likelihood of poor work and future maintenance/repair requirements.
- All contractors could be required to maintain a performance bond equal to a pre-determined percentage of the project cost.
- Such standards increase contractor costs and prices.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Higher up front costs, but lower maintenance costs.
- Better quality control of the I/I work.
- Any allowed "do it yourself" work would most likely not be subject to bonding or warranty requirements.

PRIVATE PROPERTY / LEGAL

I/I CONTROL POLICY ISSUE: **Rehab Planning, Oversight, Inspection, Monitoring and Testing – Right of Entry**

With specific exceptions, individuals cannot enter or alter property owned by another individual without explicit permission (authority for utility representatives to access private premises for the purpose of inspecting and determining code compliance can be legislated for public health and welfare). Yet initial follow-up and inspection of the condition and installation of public sewer lines and private sewer and storm drainage connections is a key to ensuring that I/I is not occurring. New standards need to be developed to ensure that the system remains intact and maintained. The right of entry for purposes other than verification of code compliance usually requires either a written agreement between the public entity and the private property owner or a notice of potential legal action.

POLICY 14

The City of Edmonds shall pass the necessary ordinances/resolutions and develop the appropriate access agreements that allow its agents to gain access to private property, such as a right of entry or a construction and inspection easement. These agreements will allow certain actions related to I/I reduction and control, such as conducting a side sewer and/or lateral inspection; construction rehabilitation; or conducting code enforcement activities.

EXPLANATION

- The right of entry to verify code compliance is usually limited in several ways, the most basic of which is that entry must occur at reasonable times. This and other limiting provisions listed below may be adopted by the City's administration.
  - Entry only by individuals with "proper" identification;
  - Entry only with prior notice;
  - Entry only with written information regarding the nature of the inspection and with the findings of the investigation (notice of non-compliance with specific portions of the code; notice of remedies and/or potential penalties).
- The method(s) used for code compliance enforcement, inspection and testing or monitoring is not implicitly or explicitly included in this basic right of entry.
- Right of entry agreements, easements and legal notices will vary in complexity and scope of action though with legal advice some basic policy procedures can be drafted and used in routine actions. Unique agreements would be drafted for complex or unusual situations. General delimiters for access agreements include scope of public action, result of property damage or personal injury, and hold harmless and indemnification provisions. Administrative use of these legal instruments depends upon the authority granted by the Edmonds City Council.

POTENTIAL EDMONDS IMPACTS

- Allows the flexibility for the City to select and implement its preferred programmatic approach (e.g., all new side sewers could be located in an easement area that allows for future entry by the City to perform inspections and work without a separate right-of-entry agreement; side sewer permits could be expanded to include the entire residential drainage system).
- The City may undertake different actions according to its I/I reduction projects and applicable local regulations. Since most municipalities' codes allow only sewerage to enter the sanitary sewer system, using the basic right of entry to investigate code compliance could be the first

action to control improper inflow from private property. Once the initial I/I control remedies are in place, periodic investigation of code compliance may involve increased resources such as: inspectors, code compliance officers, engineers and/or attorneys. Record keeping would be crucial to track follow-up actions and inspection schedules.

- Utility storm water and sanitary sewer codes may have to be amended to include right-of-entry authority.
- The ease or difficulty of obtaining specific right-of-entry agreements or easements will depend on the property's I/I contribution to the system and the Policies and Standards of the I/I Control Program, e.g., the scope of work or the amount of restoration.
- Coordination between areas of responsibilities would be key, e.g., building permits and sewer permits; building and utility inspectors; maintenance, engineering and CIP personnel.

Potential Private Property/Ratepayer Impacts

- Many individuals may not realize that municipal representatives have the authority to enter their property to perform code compliance inspections. Municipal employees and legislators may have to cope with a range of reactions from accommodation to active resistance. These actions can be anticipated and a plan of action established.
- The types of private improvements (and landscaping) in the easement area should be restricted to simplify and standardize any future side sewer work and to prevent side sewer deterioration. There should be restrictions to the property owner making changes in side sewer location when remodeling occurs.
- For new construction the residential property owner's contractor would remain responsible for the work performed meeting code, and that it is "signed off" by the City's inspector.
- The cost of permits could increase to cover the increased intensity of service or the cost could be absorbed within the general residential rate base.

I/I CONTROL POLICY ISSUE: **Rehabilitation Planning and Oversight – Liability**

All phases of the I/I work on privately owned property could create liability issues. Some liability issues such as negligence, are a recognized concern. Side sewer and other excavation on private property may result in some special liability issues. The standards of work and documentation of conditions on private land are more varied than those found on public property and public right-of-ways. Potential liability matters may be limited in various ways.

POLICY 15

If public resources support any portion of the I/I reduction work on privately owned property, then the City of Edmonds shall establish a process to manage and limit its liability. The potential site and in-ground liability issues shall be a part of the I/I planning and design process, including an up-front agreement on when the jurisdiction's liability will begin and end.

Explanation

- When digging on private land, various types of unexpected conditions and systems are likely to be found, for example: underground oil tanks and contaminated soils, sprinkler systems and water lines, “invisible” dog fences, non-conforming in-use wells and septic systems, electrical and data cables, etc. Some of these conditions and systems are likely to be found in the areas of any side sewer work and pose a liability issue to the homeowner, contractor, governmental agency and/or the general public.
- Field reports suggest that about 25% of oil tanks leak. If contaminated soil is found during an excavation, then remediation is required and the issue of liability would have to be addressed.

Potential Edmonds Impacts

- Pre-digging protocols such as inspections to identify underground infrastructures and/or contaminated soil could reduce the potential liability disputes and costs.
- Resolution of disputes may become an issue that will need to be addressed by City staff and/or their attorneys.
- The City will *need to work closely with the homeowners, no matter what.*

Potential Private Property/Ratepayer Impacts

- Property owners may refuse permission to inspect or test for potential liability issues and might prefer not to know about such issues.
- Property owners may end up having to address the problem of soil contamination.
- Property owners will desire that the work minimize disruption to existing property improvements and landscaping.

I/I CONTROL POLICY ISSUE:	**Legislative Action Requirements**
In order to implement effective I/I reduction on private property, specific building codes enacted at the State level may need to be amended.	

POLICY 16

The City of Edmonds shall work to develop amended Statewide building codes to facilitate the implementation of effective I/I reduction measures.

Explanation

- Certain Statewide building codes, such as the State Plumbing Code, allow for items such as sump pumps and footing drains to be installed within the footprint of the building and do not specify where the resulting water is to be discharged. Code language may need to be amended to require discharge to a storm sewer (non-sanitary) system or location.

Potential Edmonds Impacts

- City staff time and expense working with the State Legislature and Trade Organizations.
- City expense could be reduced and message more effectively delivered through MWPAAC.

Potential Private Property/Ratepayer Impacts

- Additional cost to the property owner as reflected in developer/contractor costs.

]

I/I CONTROL POLICY ISSUE: **Side Sewer Ownership and Responsibility**

In Edmonds, side sewers are owned by the City from the sewer main to the property line, and by the property owner from the property line to the building connection. This can cause reduced effectiveness in a long-term I/I reduction program and could be modified by several options.

POLICY 17

The City of Edmonds shall assume ownership and/or responsibility for each side sewer from the sewer main to the point(s) of connection at the building.

EXPLANATION

- With the City having overall ownership and/or responsibility for the entire side sewer assembly from building to main, more effective construction inspection/oversight, as well as ongoing operation and maintenance, will increase the likelihood that long-term I/I reduction can be realized.
- Enabling legislation by the City Council and cost or other compensation for assuming ownership will be required.

POTENTIAL EDMONDS IMPACTS

- If ownership is assumed, additional compensation to property owners would be required.
- Increased City staff time and expense (or consultant) for side sewer installation inspection/oversight.
- Increased City staff time and expense to set up and maintain a long-term O&M program.
- More effective operation of the sewage conveyance system.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Increased access by City representatives on private property.
- Potential for increased costs due to increased O&M by City.
- Potential for reduced liability to property owner.

TITLE: Modeling and Engineering Analysis

GUIDELINE NO. G-1

I/I CONTROL MEASURE ISSUE:
Following the completion of the Edmonds sewer system modeling performed previously, the modeling basins should be reevaluated on a regular basis with updated flow and system network information to provide an ongoing tool for monitoring the integrity of the sewer system as it both ages and expands. Hydraulic models can also be used to evaluate system response to potential high-flow sources such as high-water-use industries, adjoining jurisdictions, or large developments.

GUIDELINE

- Sewer system modeling should be conducted on a regular basis to assess system loading and capacity for ongoing and future sewer planning efforts. A dynamic software modeling program should be used that can be used to calibrate measured flow data with rainfall measured during the corresponding storm. Flow data shall be obtained by the City of Edmonds, including measurement of wet-weather/storm conditions and concurrent rainfall data.
- Development of a reliable, well-calibrated model requires good as-built plans and maps, and long-term flow monitoring data. The City shall maintain an as-built record for new and modified piping.

POTENTIAL EDMONDS IMPACTS

- Competency of staff in computer modeling and interpretation, or outsourcing to a consultant on a periodic basis.
- Proactive planning and logistics for maintaining an as-built database.
- Purchase of license for a sewer software model, or cost to develop alternative model.
- Cost for training and operation of model by City staff.
- Expense for flow monitoring equipment and staff, whether purchased or leased/rented on a periodic basis.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impact.

TITLE: Lateral and Side Sewer Rehabilitation Methods

GUIDELINE NO. G-2

I/I CONTROL MEASURE ISSUE:

Once the decision has been made to rehabilitate laterals or side sewers to control I/I, several alternatives may be used to replace or rehabilitate the pipe. These include trenchless rehabilitation techniques such as cure-in-place lining or pipe bursting, as well as conventional dig and replace. An evaluation should be made to determine suitability (technical and cost-effectiveness) of trenchless methods versus conventional dig and replacement of the sewer. The technical evaluation should assess specific issues such as the sewer location and length, alignment, condition of the pipe being replaced, assessment of the surface features that would be disturbed by construction, and the degree of root intrusion in the existing lines. The alternative pipe rehabilitation methods that should be considered include:

Pipe bursting is a trenchless pipeline rehabilitation method that can be used to replace side sewer pipes. Illicit connections are eliminated by removing the connection to the side sewer. It is possible to increase the size of the pipe; however, site specific constraints may limit the ability to increase the size. Using pipe bursting to replace a pipe may be restricted depending upon adjacent utilities, proximity to surface improvements, the type of existing pipe being replaced, and soil conditions. There are a number of variations on pipe bursting, such as pneumatic, hydraulic expansion, and static pull systems. All of these displace the old pipe into the adjacent ground and pull a new pipe in to replace the old pipe. There are also related processes such as pipe reaming, which is a variation of horizontal directional drilling, where pieces of the old pipe are removed rather than pushing them into the adjacent soil. The most common pipe material used is HDPE, but other types of pipe material such as cast iron, MDPE, and ABS can be used for the replacement pipe. Pipe bursting of side sewers will require excavation of at least two pits for insertion and pulling. Generally, pipe bursting is suitable for straight sections. If there are buried bends on the side sewer it may require additional pits to be excavated for installation of the replacement pipe.

Cure-in-place pipe (CIPP) liner is a trenchless pipeline rehabilitation method that can be used to repair existing side sewer pipes. CIPP liner involves inverting an epoxy-resin-impregnated flexible tube into an existing line using hydrostatic head. The resin is then cured using heat to produce a pipe inside the existing side sewer. The outside diameter of the replacement pipe is smaller than the existing pipe to allow the system to be installed. Capacity in the pipeline will be reduced because of the reduction in pipe size.

Fold and form lining is a trenchless pipeline rehabilitation method that can be used to repair existing side sewer pipes. The fold-and-form process involves inserting a heated PVC or HDPE thermoplastic liner, folded or deformed into a U-shape, into an existing side sewer and re-rounding the liner using heat and pressure to produce a pipe inside the existing pipe. The outside diameter of the replacement pipe is smaller than the existing pipe to allow the system to be installed. Capacity in the pipeline will be reduced because of the reduction in pipe size.

GUIDELINE

- Construction standards for pipe bursting, cure-in-place lining and folded and formed liners shall be as follows:
- Pipe Bursting:
  - Pipe bursting shall meet the requirements of the City's Inflow and Infiltration Control Program Guide Specifications.
- Cure-in-Place Lining:
  - Cure-in-place-lining shall meet the requirements of the City's Inflow and Infiltration Control Program Guide Specifications.
- Fold and Form:
  - Fold and form-lining shall meet the requirements of the City's Inflow and Infiltration Control Program Guide Specifications.

- Testing and Inspection:
  - The rehabilitated side sewer/lateral from the inspection wye/cleanout at the building foundation to the main side sewer/lateral pipeline shall be tested in accordance with the I/I Side Sewer/Lateral Leak Testing Standard S-20, and shall be television inspected in accordance with the I/I CCTV Inspection Standard S-25 after completion of the repairs and backfilling of the pipe trench.

POTENTIAL EDMONDS IMPACTS

- Added cost to perform inspection and testing.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Added cost for inspection and testing of private sewer lines.

TITLE: Pipe Protection-Depth of Cover

GUIDELINE NO. G-3

I/I CONTROL MEASURE ISSUE:
Shallow buried flexible pipe is susceptible to damage from heavy live loads and construction loads. Deeply buried flexible pipe is susceptible to damage from heavy soil loading. Pipe type, class, and the quality of the pipe bedding installation are especially important for flexible pipe buried less than 3 feet deep and greater than 15 feet deep beneath a general fill. Standard industry practice based on load testing, engineering analysis and field experience is to maintain a minimum cover over flexible pipe of 3 feet to avoid damage from heavy live loads and construction loads. Burial depths greater than 15 feet create soil loading conditions that exceed the capacity of flexible pipe unless extremely careful attention is paid to pipe bedding installation.

GUIDELINE

- Depth of cover over flexible pipe should be 3 feet minimum and 15 feet maximum. Where the depth of cover over a pipe is less than 3 feet or exceeds 15 feet, follow pipe manufacturer's recommendations for pipe material type and class, pipe installation procedures, bedding and backfill.
- Testing and inspection: Full time inspection of pipe bedding operation should be performed on flexible pipe installations over 15 feet.

POTENTIAL EDMONDS IMPACTS

- Inspection of bedding operations to ensure proper installation is especially critical for deeply buried flexible pipe.
- Inspection costs would go up if the City is currently not continuously inspecting bedding placement for deeply buried flexible pipe.
- Review of supporting calculations would be required when flexible pipe is used for installations over 15 feet.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Construction costs for deeply buried pipe may increase moderately, thus increasing costs to ratepayers.

TITLE: Manhole Rehabilitation

GUIDELINE NO. G-4

I/I CONTROL MEASURE ISSUE:
Manhole rehabilitation can be used to eliminate sources of both infiltration and inflow directly into the structure where the rehabilitation is determined to be more cost effective than replacement of the manhole. There are a variety of rehabilitation techniques, including manhole grouting, cementitious spray-on lining, epoxy linings, manhole inserts, and cure-in-place liners. Many of the methods provide benefits other than just I/I reduction such as protection from internal corrosion due to hydrogen sulfide. Manhole rehabilitation for I/I reduction may also include replacement of manhole rings or replacement of the ring and cover.

GUIDELINE

- When a manhole is rehabilitated for I/I reduction, consideration should be given to factors that contributed to the current condition and whether the selected rehabilitation technique will prevent the potential recurrence of I/I. Rehabilitation techniques include spray on coatings, cure-in-place linings, chemical grouting, or a rigid liner installed within the existing manhole. Coatings, linings and chemical grouting for manhole rehabilitation shall meet the requirements of the City's I/I Control Program Guide Specifications.

POTENTIAL EDMONDS IMPACTS

- Inspection requirements to confirm that the manhole preparation and rehabilitation is done correctly.
- Potential surface disruptions resulting from construction of the rehabilitation.
- Costs to test the completed manhole rehabilitation.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Potential inconveniences resulting from rehabilitation construction activities.

TITLE: Spot Repairs

GUIDELINE NO. G-5

I/I CONTROL MEASURE ISSUE:
Pipeline spot repairs are repairs to specific deficiencies in a pipeline, such as a specific leaking pipe joint. These repairs can be a cost-effective way to eliminate I/I in sections of a pipeline that are sound except for a few point locations. Only those specific deficiencies in the pipeline are repaired. In general, in pipeline sections that require three or more spot repairs, it is often more cost-effective to consider the entire manhole-to-manhole run of pipe for rehabilitation or replacement.

GUIDELINE

- Spot repairs can be accomplished by several different methods from trenchless systems like short CIPP liners, to injecting epoxy resins or chemical grout into leaking pipe joints, to dig and repair with structural grouting sleeves or short sections of pipe replacement. The repair method shall address whether the defect is structural or limited to an intact leaky joint. Spot repairs may be needed to properly prepare the line for some of the manhole-to-manhole rehabilitation/replacement options.
- For a dig and replace spot repair, the section of the sewer main shall be removed to the nearest joint and replaced with new pipe. The new section of pipe shall be installed with repair couplings meeting the City of Edmonds's approval but in any case shall provide a water tight repair.
- Trenchless spot repairs shall meet the I/I standard for the particular rehabilitation method used.
- If SSES reveals there are 3 or more defects that require repair on a manhole to manhole run of sewer main, it is recommended that the entire run of sewer be evaluated for rehabilitation or replacement.

POTENTIAL EDMONDS IMPACTS

- The costs associated with testing and inspecting the spot repair.
- Surface disruptions from construction activities may inconvenience the public.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- No impact.

TITLE: Spot Repairs (Side Sewers)

GUIDELINE NO. G-6

I/I CONTROL MEASURE ISSUE:
Private side sewer spot repairs are repairs to specific deficiencies in a side sewer pipe, such as a specific leaking pipe joint. These repairs can be a cost effective way to eliminate I/I in sections (generally cleanout-to-cleanout that show damage) of a side sewer that are sound except for a few point locations. Only those specific deficiencies in the side sewer are repaired. In sections with numerous spot problems or with other mitigating factors such as age, the entire side sewer is a candidate for complete rehabilitation or replacement.

GUIDELINE

- As a precursor to doing spot repairs, the City of Edmonds shall assess the age and material of the side sewer to determine if it should be completely replaced rather than allow spot repairs. If a side sewer is over 50 years old, it should be completely rehabilitated or replaced from the building to the public right-of-way.
- Spot repairs can be accomplished by several different methods from trenchless systems like CIPP liners, injecting epoxy resins, or chemical grout, to dig and repair with structural grouting sleeves or short sections of pipe replacement. The repair method shall address whether the defect is structural or limited to an intact leaky joint.
- For a dig and replace spot repair, the section of the side sewer shall be removed to the nearest joint and replaced with new pipe meeting the requirements of the I/I Pipe Materials Guideline G-6. The new section of pipe shall be installed with approved repair couplings.
- Trenchless spot repairs shall meet the I/I standard for the particular rehabilitation method used.
- Inspection wye/cleanouts shall be installed on the side sewer per Standard Detail SS-1as part of the spot repair.

POTENTIAL EDMONDS IMPACTS

- Cost of installing the inspection wye/cleanout if none exists.

POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Added cost will be incurred if no inspection wye/cleanout exists in the system.

TITLE: Manhole Lids/Inserts

GUIDELINE NO. G-7

I/I CONTROL MEASURE ISSUE:
Older style manhole covers may contain numerous pick holes that allow inflow into the collection system during storm events. Old and new manhole covers are both susceptible to inflow through or around the cover if water ponds over the cover. Eliminating this source of inflow will reduce excess flow from entering the system. Replacing the cover with a new cover will reduce or eliminate this source of inflow.

GUIDELINE

- Manhole covers that have been identified through an SSES as being susceptible to inflow may be replaced with a gasketed solid cover or just the ring or cover may be replaced if it is determined to be the source of the problem.
- In lieu of replacing the cover a manhole insert may be installed under the existing cover to eliminate or reduce the volume of inflow that enters the sewer. Manhole inserts are metal or plastic pans installed just under the manhole cover and are supported by the manhole ring. All materials used in the manufacture of manhole inserts shall be plastic or stainless steel in accordance with Standard Detail MH-3.

POTENTIAL EDMONDS IMPACTS

- Installation will be disruptive to traffic if the manhole is located in a street.
- Minor additional cost for using solid, gasketed covers.

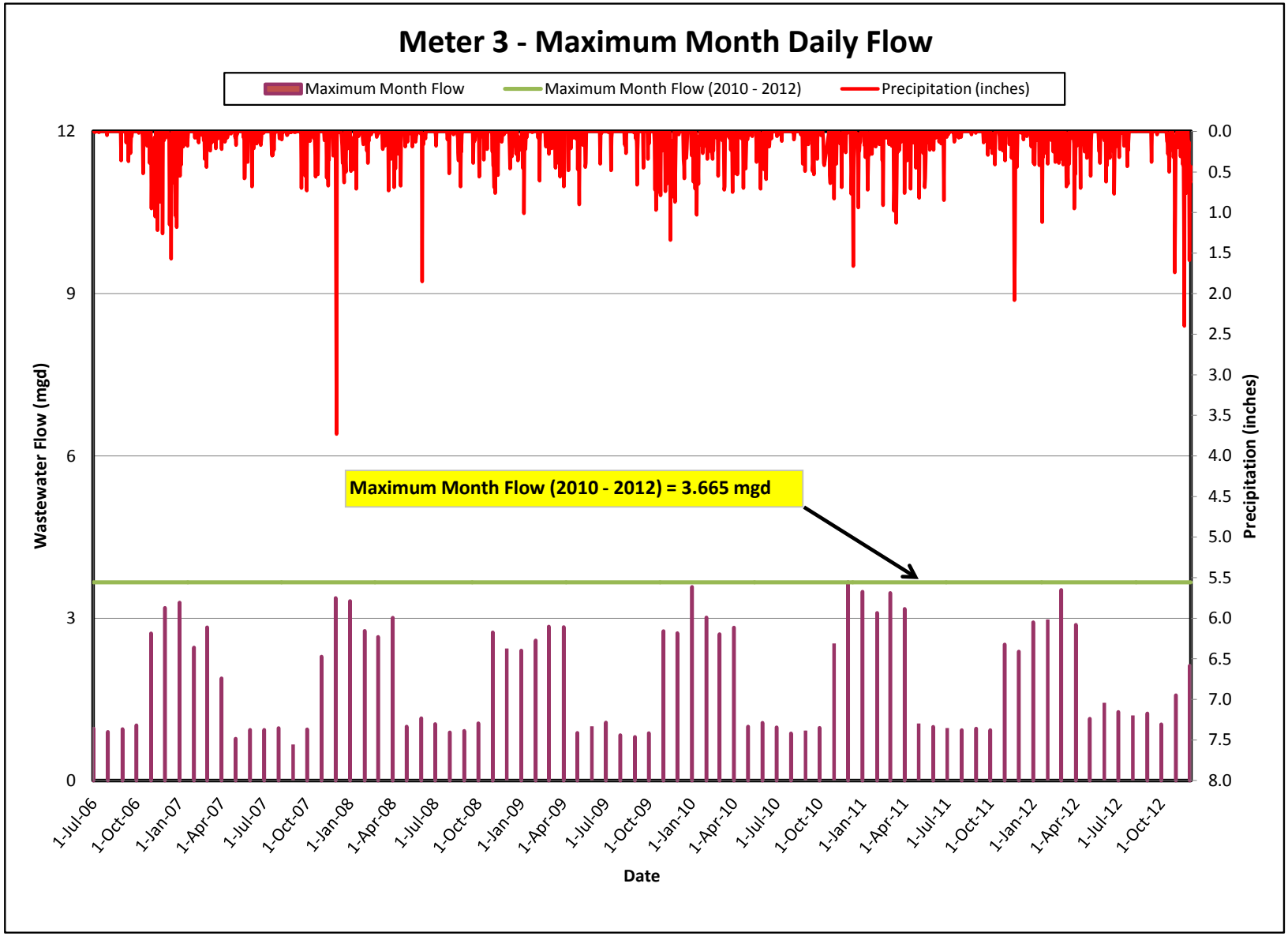
POTENTIAL PRIVATE PROPERTY/RATEPAYER IMPACTS

- Possibly traffic inconveniences during the ring and cover replacement.

APPENDIX B

Model Calibration and Documentation

- Meter A Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter 3 Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter C Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter E Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter Richmond Beach Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter D Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter B Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter 2 Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Meter 1 Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Edmonds Meter at WWTP Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- MLT Meter at WWTP Flows – Average Dry Weather, Average Daily, Average Wet Weather, Maximum Month Daily
- Table B.1 Summary of Model Results


Meter 3 - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 3.665 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
12
9
6
3
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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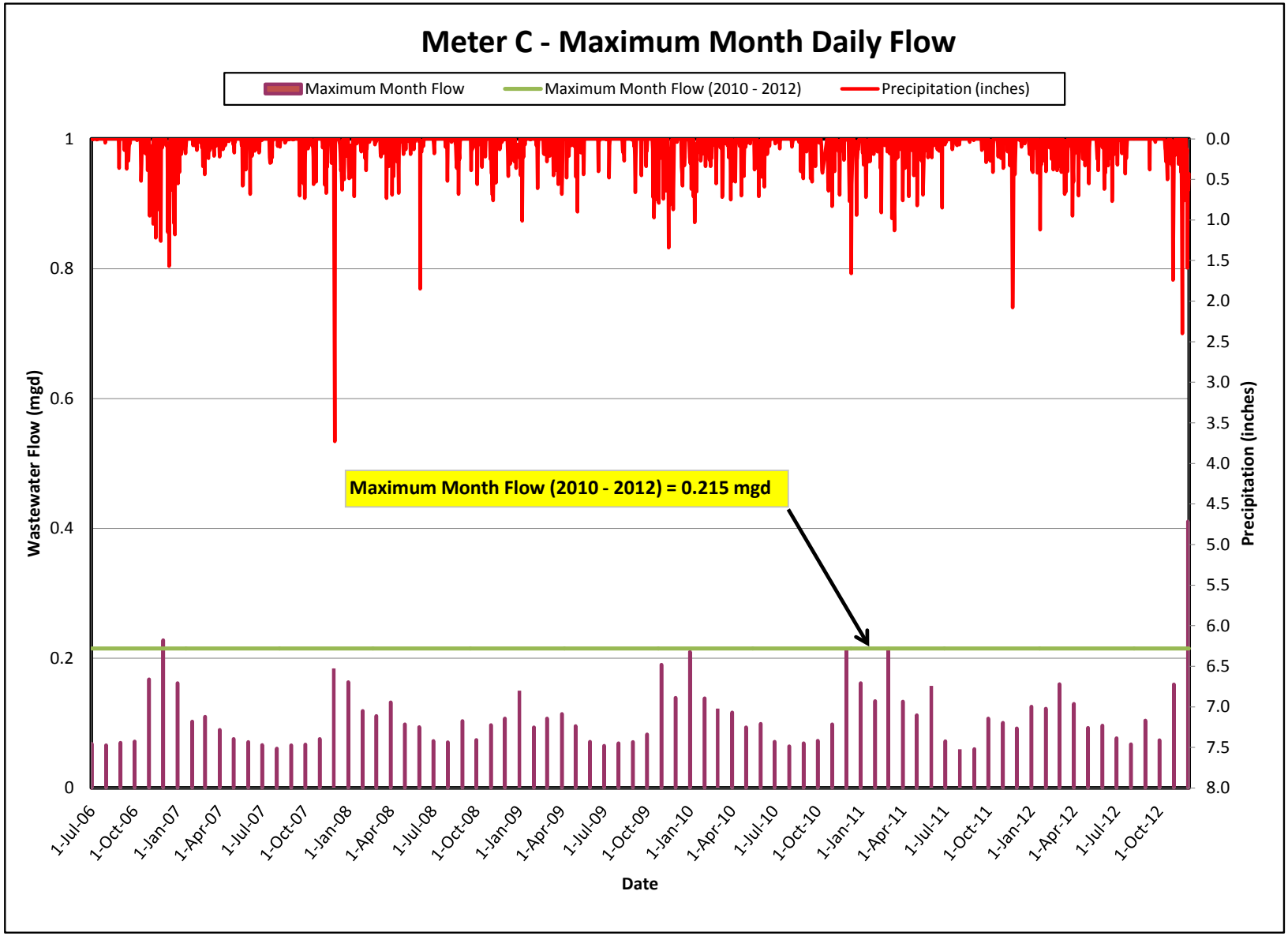
1-Jul-12
1-Oct-12


Meter C - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 0.215 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
1
0.8
0.6
0.4
0.2
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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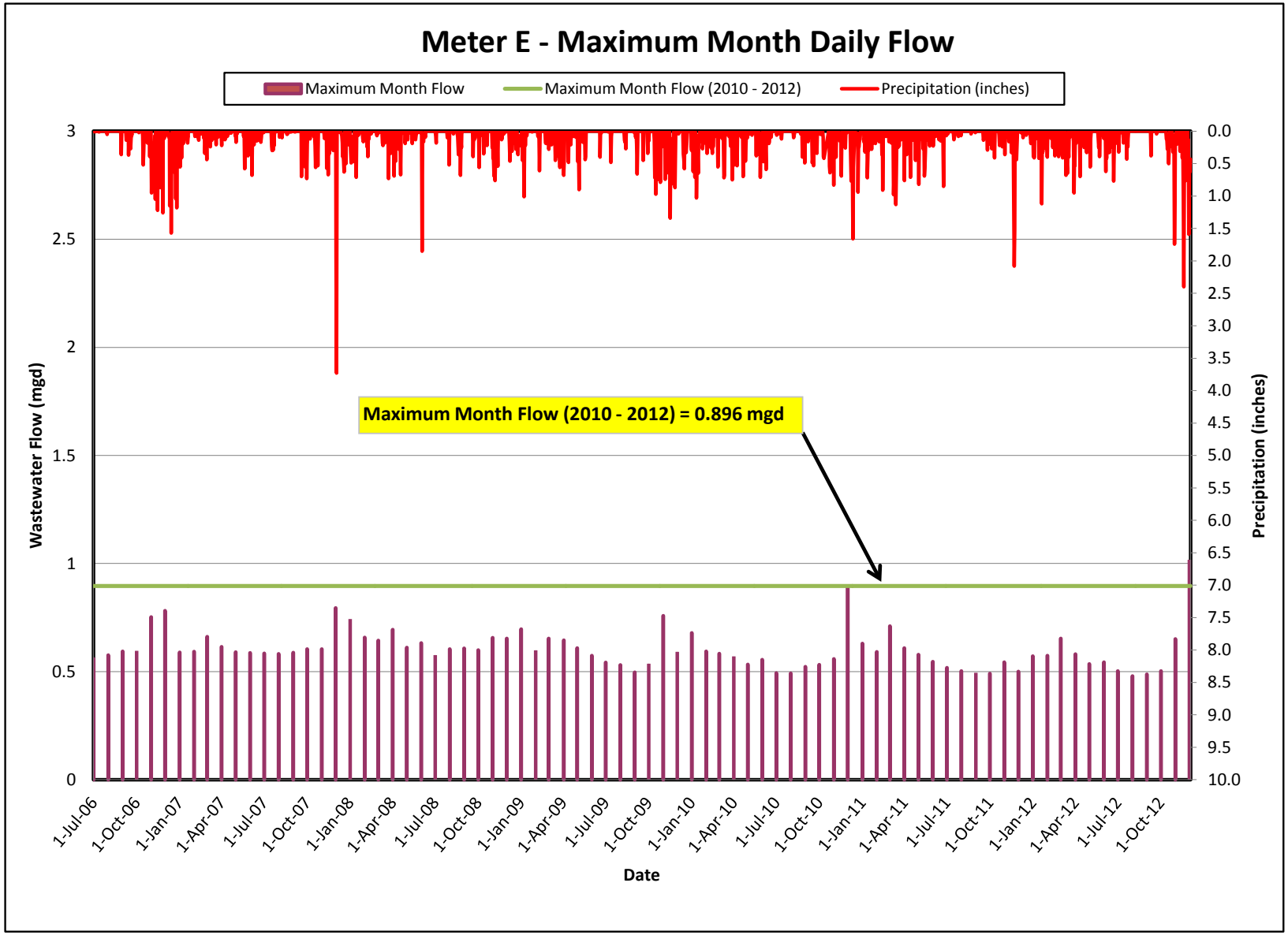
1-Jul-12
1-Oct-12


Meter E - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 0.896 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
3
2.5
2
1.5
1
0.5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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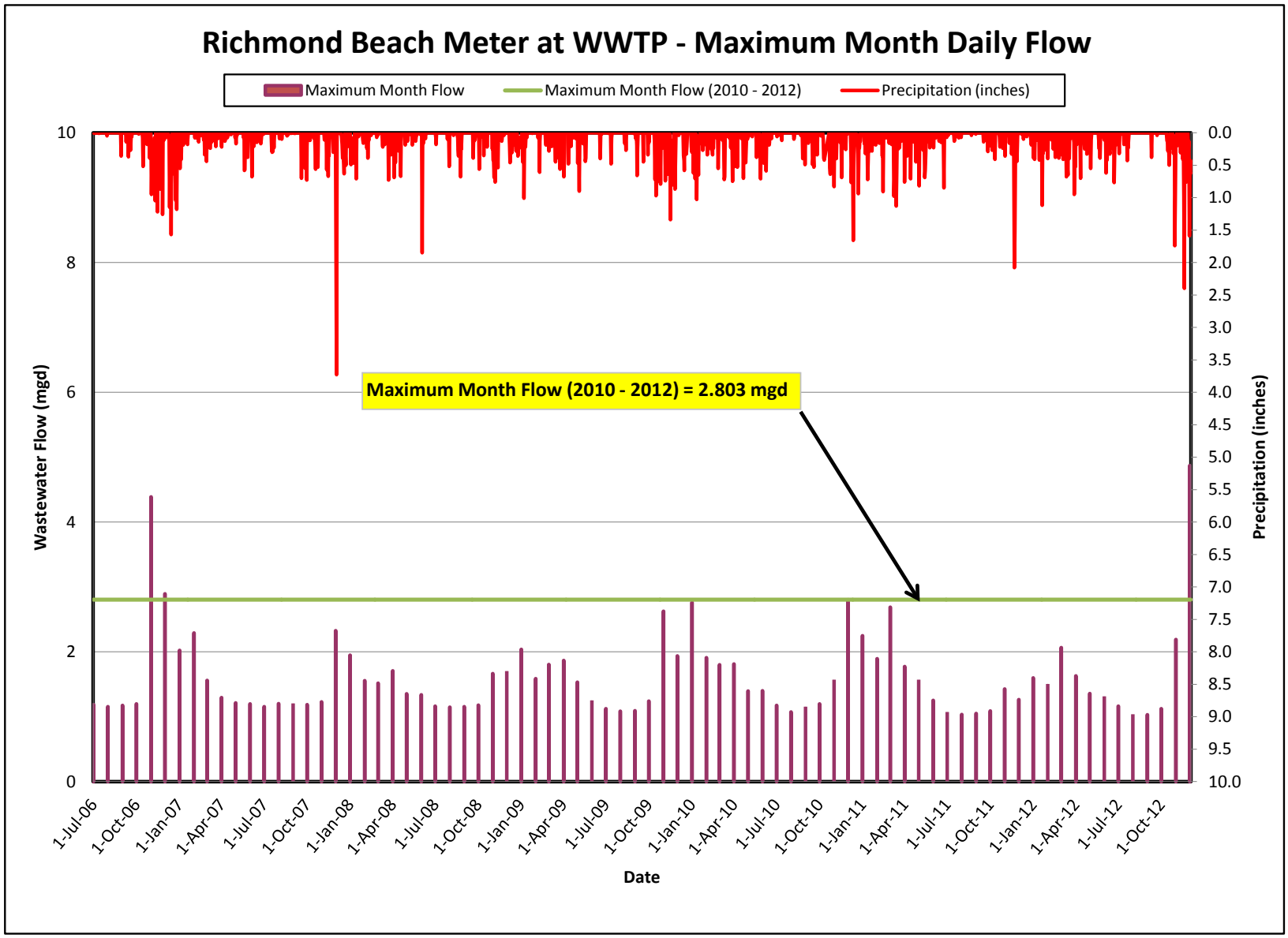
1-Jul-12
1-Oct-12


Richmond Beach Meter at WWTP - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 2.803 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
0
2
4
6
8
10
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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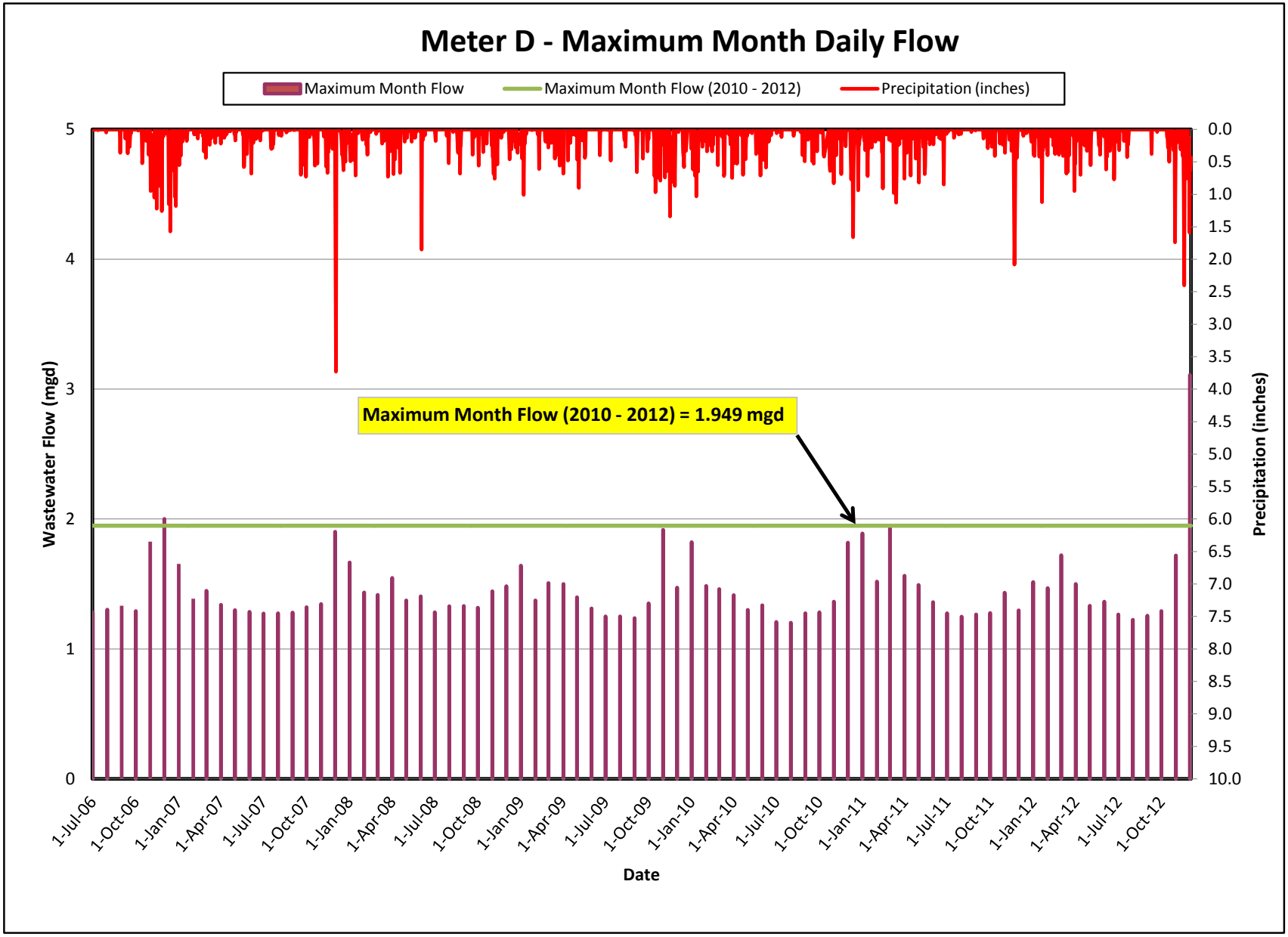
1-Jul-12
1-Oct-12


Meter D - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 1.949 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
0
1
2
3
4
5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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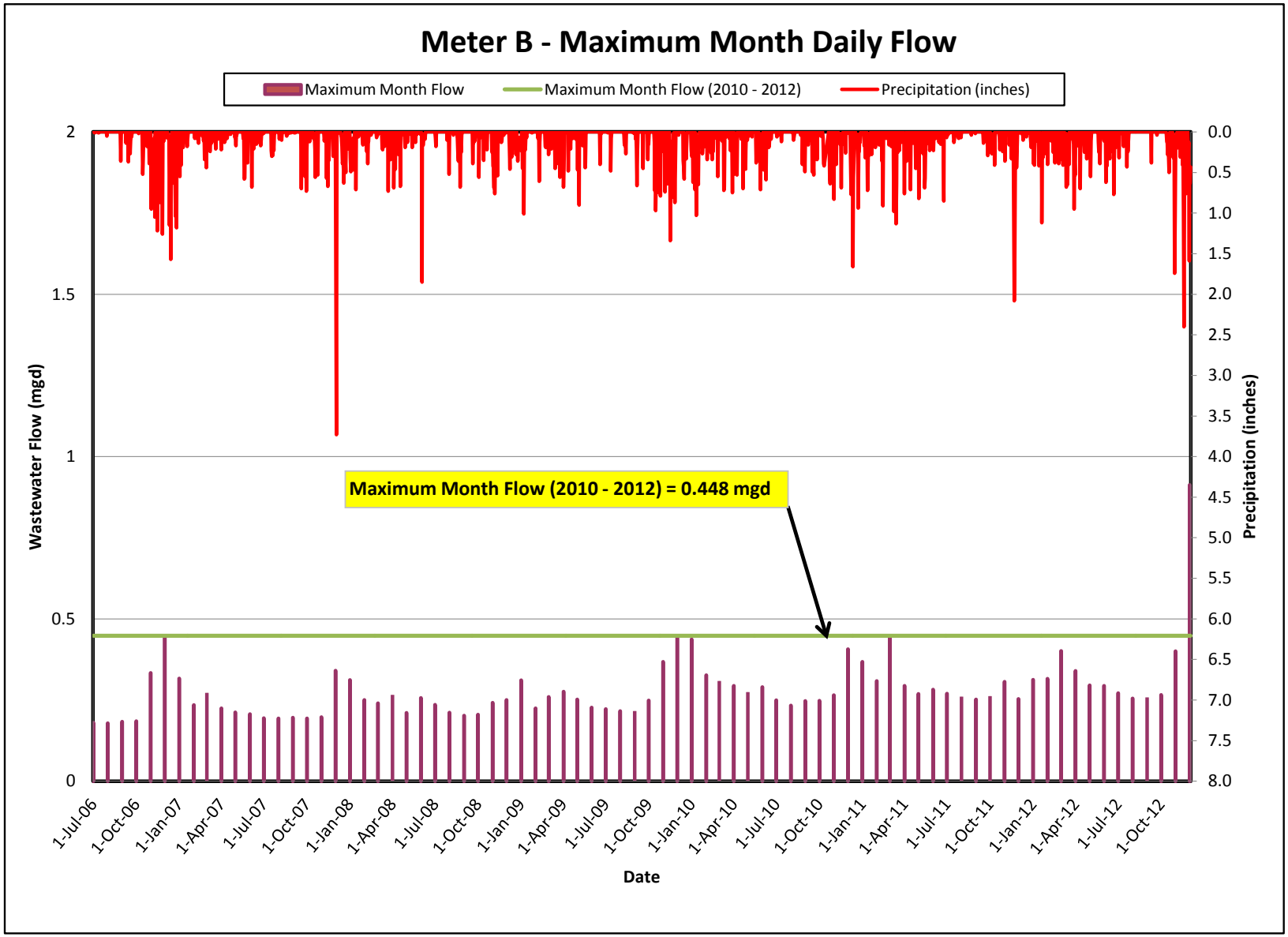
1-Jul-12
1-Oct-12


Meter B - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 0.448 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
2
1.5
1
0.5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
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1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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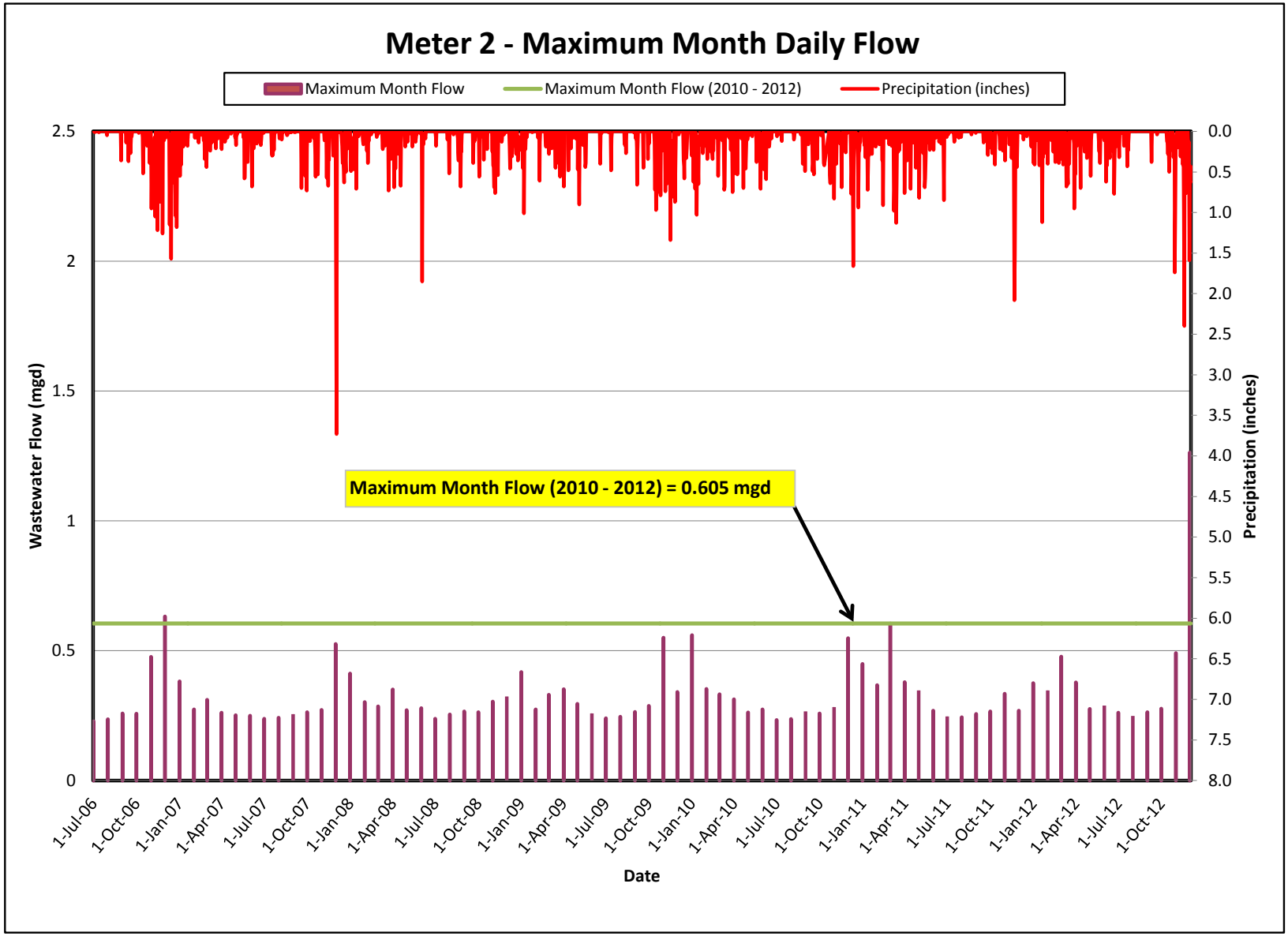
1-Jul-12
1-Oct-12


Meter 2 - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 0.605 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
2.5
2
1.5
1
0.5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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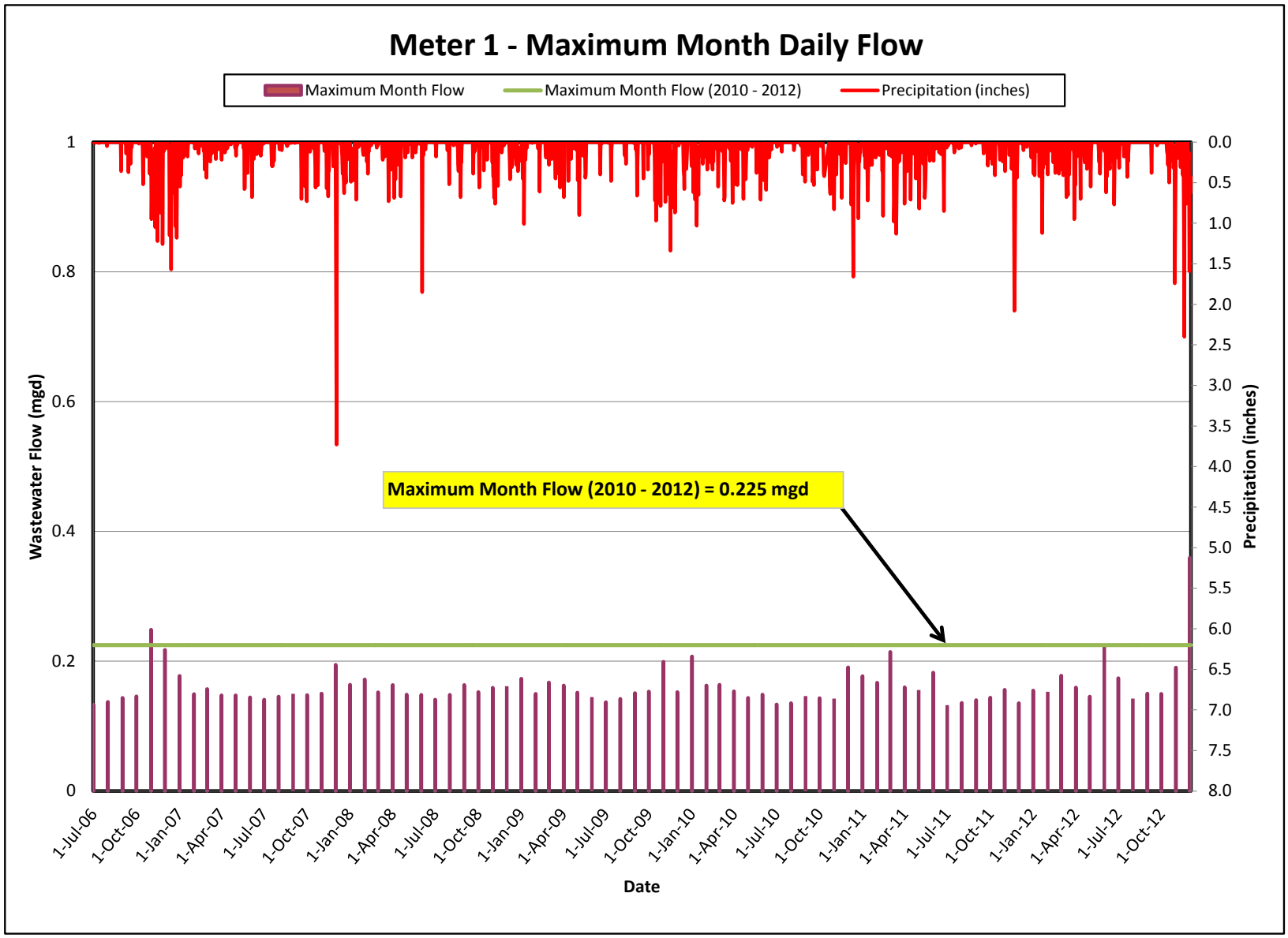
1-Jul-12
1-Oct-12


Meter 1 - Maximum Month Daily Flow
Maximum Month Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 0.225 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
1
0.8
0.6
0.4
0.2
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
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1-Oct-07
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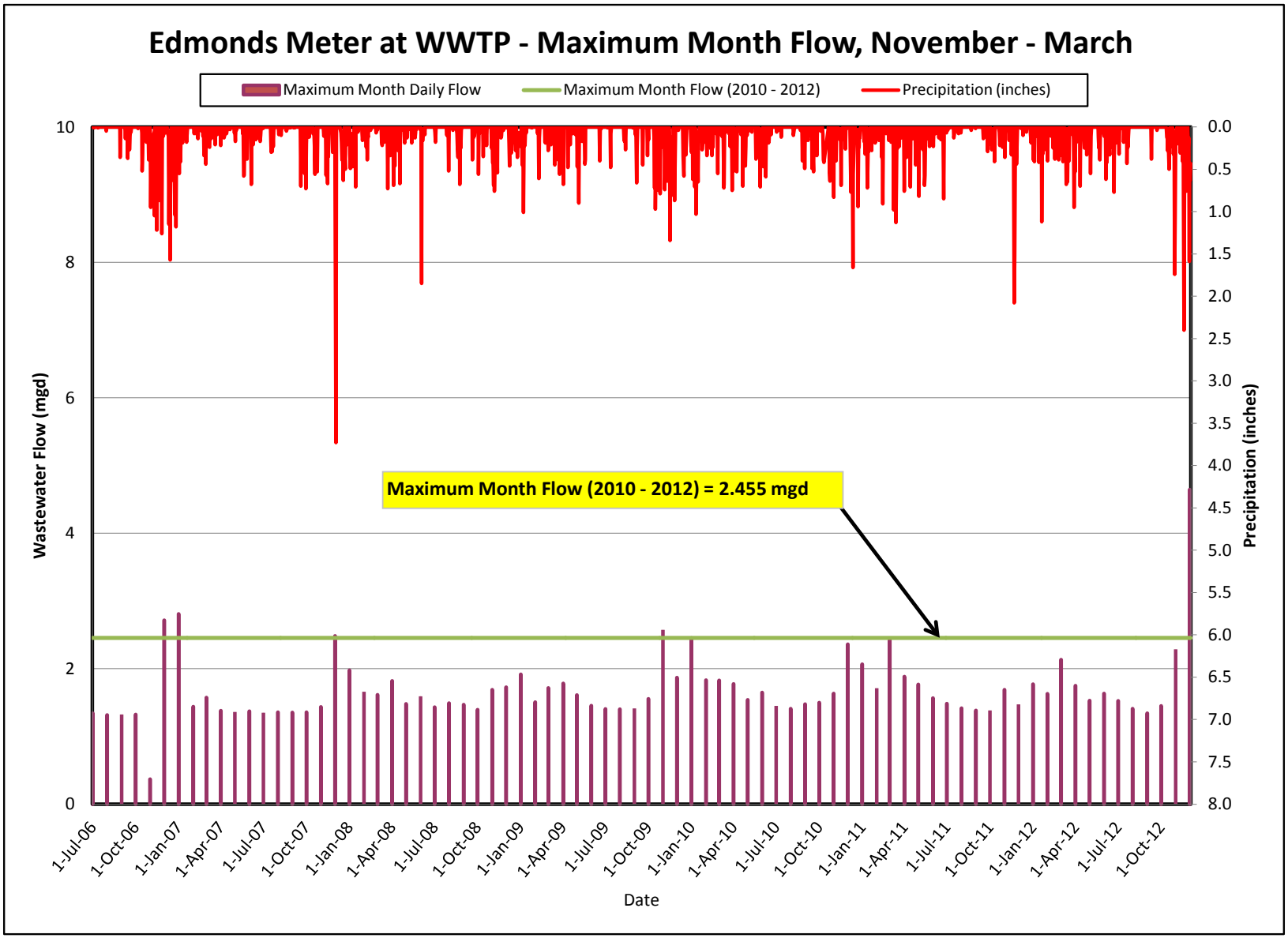
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
1-Oct-10
1-Jan-11
1-Apr-11
1-Jul-11
1-Oct-11
1-Jan-12
1-Apr-12
1-Jul-12
1-Oct-12


Edmonds Meter at WWTP - Maximum Month Flow, November - March
Maximum Month Daily Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 2.455 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
0
2
4
6
8
10
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
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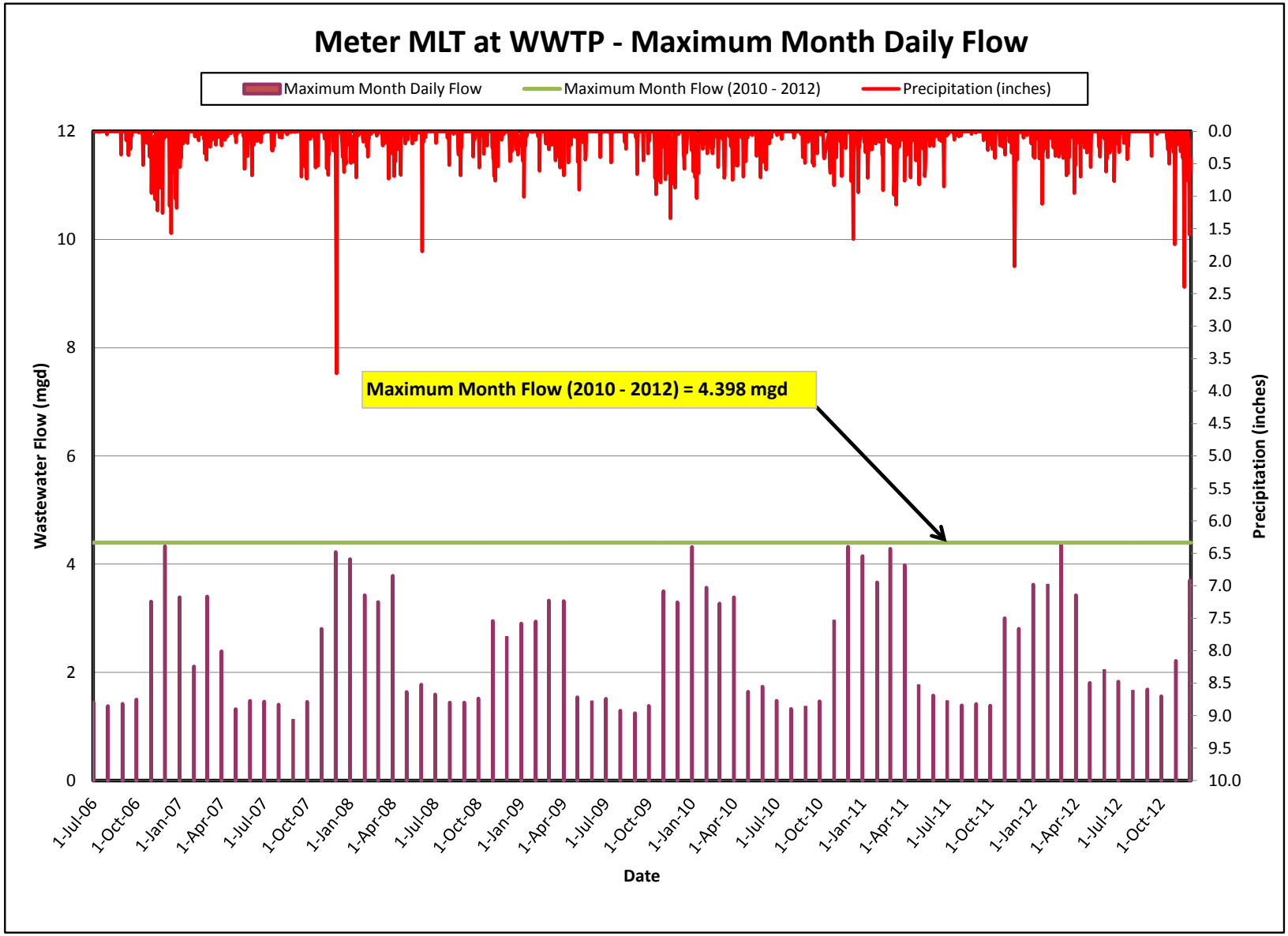
1-Jul-12
1-Oct-12


Meter MLT at WWTP - Maximum Month Daily Flow
Maximum Month Daily Flow
Maximum Month Flow (2010 - 2012)
Precipitation (inches)
Maximum Month Flow (2010 - 2012) = 4.398 mgd
Wastewater Flow (mgd)
Precipitation (inches)
Date
0
2
4
6
8
10
12
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
1-Jul-06
1-Oct-06
1-Jan-07
1-Apr-07
1-Jul-07
1-Oct-07
1-Jan-08
1-Apr-08
1-Jul-08
1-Oct-08
1-Jan-09
1-Apr-09
1-Jul-09
1-Oct-09
1-Jan-10
1-Apr-10
1-Jul-10
1-Oct-10
1-Jan-11
1-Apr-11
1-Jul-11
1-Oct-11
1-Jan-12
1-Apr-12
1-Jul-12
1-Oct-12

Appendix B

Table B1: Capacity limited pipes with proposed diameter and proposed upsize year

Pipe Name	Existing Diameter (in)	Proposed Diameter (in)	Upsize Year
7-32D-ED-WWTP	36	42	2013
11-20-11-19	24	42	2013
11-18-7-33	24	42	2013
16-127-16-128	24	42	2013
11-19-11-18	24	42	2013
17-87-17-88	24	36	2013
17-48-17-59	24	36	2013
17-88-17-89	24	36	2013
17-47-17-48	24	36	2013
17-59-17-60	24	36	2013
17-61-17-84	24	36	2013
17-60-17-61	24	36	2013
17-85-17-86	24	36	2013
17-84-17-85	24	36	2013
17-86-17-87	24	36	2013
16-132-16-133	24	36	2013
16-128-16-129	24	36	2013
12-268-12-278	24	36	2013
16-135-16-136	24	36	2013
16-136-16-137	24	36	2013
16-129-16-130	24	36	2013
16-131-16-132	24	36	2013
15-7-15-5A	24	36	2013
15-13-15-13A	24	36	2013
12-267-12-268	24	36	2013
15-11-15-10	24	36	2013
15-8-15-7	24	36	2013
16-135A-16-135	24	36	2013
12-265-12-267	24	36	2013
16-133-16-134	24	36	2013
15-3-15-2A	24	36	2013
15-11A-15-11	24	36	2013
11-25-11-24	24	36	2013
15-5A-15-4A	24	36	2013
15-4A-15-4	24	36	2013
15-10-15-9	24	36	2013
11-28A-11-27	24	36	2013
8-265-8-266	15	21	2013
8-280-8-281	15	21	2013
8-281-8-282	15	21	2013
8-278-8-279	15	21	2013

Pipe Name	Existing Diameter (in)	Proposed Diameter (in)	Upsize Year
8-275-8-278	15	21	2013
8-266-8-275	15	21	2013
8-279-8-280	15	21	2013
7-84-7-85	15	18	2013
14-62-14-63	12	18	2013
14-64-17-14	12	18	2013
17-9-17-10	12	18	2013
17-11-17-17	12	18	2013
17-14-17-9	12	18	2013
17-10-17-11	12	18	2013
14-63-14-64	12	18	2013
7-40-7-48	12	18	2013
7-41-7-40	12	18	2013
14-53-14-55	12	18	2013
14-56-14-62	12	18	2013
7-48-7-47	12	18	2013
7-47-7-50	12	18	2013
12-105T-12-105U	8	18	2013
12-105D-12-105E	8	18	2013
12-105E-12-105F	8	18	2013
12-105F-12-105T	8	18	2013
12-105U-11-28B	8	18	2013
14-50-14-50C	12	15	2013
14-25-14-41	10	15	2013
8-35-8-36	10	15	2013
9-202-9-20	10	15	2013
9-2-9-1A	10	15	2013
9-193-9-196	10	15	2013
9-19-9-18	10	15	2013
9-201-9-202	10	15	2013
9-196-9-196A	10	15	2013
9-16-9-15	10	15	2013
9-17-9-16	10	15	2013
9-18-9-17	10	15	2013
9-200-9-201	10	15	2013
9-199-9-200	10	15	2013
9-198-9-199	10	15	2013
9-197-9-198	10	15	2013
9-196A-9-197	10	15	2013
9-20-9-19	10	15	2013
9-15-9-14	10	15	2013
8-33-8-34	10	15	2013
8-34-8-35	10	15	2013
14-48-14-50	10	15	2013
9-224-9-202	8	15	2013

Pipe Name	Existing Diameter (in)	Proposed Diameter (in)	Upsize Year
14-26-14-25	8	15	2013
8-41-8-42	8	15	2013
4-94-4-93	10	12	2013
4-91-4-90	10	12	2013
4-161-4-95	10	12	2013
4-162-4-161	10	12	2013
4-163-4-162	10	12	2013
4-173-4-163	10	12	2013
9-189-9-190	10	12	2013
4-92-4-91	10	12	2013
14-48A-14-48	10	12	2013
4-93-4-92	10	12	2013
4-83-4-82	10	12	2013
4-89-4-86	10	12	2013
4-84-4-83	10	12	2013
4-81-4-80	10	12	2013
8-243-8-242	10	12	2013
8-50-8-52	10	12	2013
14-40-14-39	8	12	2013
14-34-14-33	8	12	2013
9-188-9-189	8	12	2013
14-30-14-27	8	12	2013
14-31-14-30	8	12	2013
8-4-8-5	8	12	2013
8-2A-8-3	8	12	2013
12-105I-12-105H	8	12	2013
8-2-8-2A	8	12	2013
12-73-12-75	8	12	2013
8-51-8-50	8	12	2013
16-125-16-127	30	42	2019
16-124-16-125	30	42	2019
16-123-16-124	30	42	2019
7-33-7-32	30	42	2019
11-21-11-20	24	42	2019
16-134-16-135A	24	36	2019
16-130A-16-131	24	36	2019
16-130-16-130A	24	36	2019
16-137-15-13	24	36	2019
15-13A-15-12	24	36	2019
15-2-15-2B	24	36	2019
15-2B-12-265	24	36	2019
15-4-15-3	24	36	2019
12-295A-12-295B	24	36	2019
7-52-7-51	12	18	2019
17-82-17-83	10	18	2019

Pipe Name	Existing Diameter (in)	Proposed Diameter (in)	Upsize Year
9-193A-9-193	10	15	2019
14-METER3-14-47	10	15	2019
9-14-9-13	10	15	2019
9-10-9-9	10	15	2019
9-9-13-63F	10	15	2019
9-11-9-10	10	15	2019
9-12-9-11	10	15	2019
9-13-9-12	10	15	2019
9-1A-8-33	10	15	2019
8-42-8-43	8	15	2019
4-80-4-78	10	12	2019
8-244-8-243	10	12	2019
17-78-17-82	8	12	2019
7-32C-7-32D	36	42	2033
7-32-7-32A	24	42	2033
16-METER2-16-12	30	36	2033
16-119-16-METER	30	36	2033
16-122-16-123	30	36	2033
16-121-16-122	30	36	2033
16-120-16-121	30	36	2033
16-117-16-118	30	36	2033
15-2A-15-2	24	36	2033
11-24A-11-23	24	36	2033
11-23-11-21	24	36	2033
11-27-11-26	24	36	2033
17-93-17-90	24	30	2033
8-249-8-265	15	21	2033
12-294A-12-295	8	18	2033
11-28B-11-28	8	18	2033
14-50C-14-50D	12	15	2033
14-52A-14-53	12	15	2033
14-50E-14-51	12	15	2033
14-50D-14-50E	12	15	2033
14-52-14-52A	12	15	2033
14-46-14-METER3	10	15	2033
14-47-14-48	10	15	2033
8-40-8-41	10	15	2033
8-39-8-40	10	15	2033
8-36-8-37	10	15	2033
8-37-8-39	10	15	2033
4-173A-4-173	10	12	2033
4-78-8-244	10	12	2033
4-82-4-81	10	12	2033
8-21A-8-51	10	12	2033
8-52-8-59	10	12	2033

Pipe Name	Existing Diameter (in)	Proposed Diameter (in)	Upsize Year
16-83-17-69	8	12	2033
14-7A-14-7	8	12	2033
4-100-4-100A	8	12	2033
17-69-17-73	8	12	2033
8-3-8-4	8	12	2033
17-75-17-78	8	12	2033
14-27-14-26	8	12	2033
17-74-17-75	8	12	2033
12-75-8-14	8	12	2033
17-89-17-90	24	36	2019A
15-12-15-11A	24	36	2019A
9-190-9-193A	10	12	2019A
17-81-17-82	8	12	2019A
17-80-17-81	8	12	2019A
16-118-16-119	30	36	2033A
11-25A-11-25	30	36	2033A
11-26-11-25A	24	36	2033A
17-90-SHORELINE	24	36	2033A
17-92-17-93	24	30	2033A
17-46-17-47	24	36	Buildout
15-9-15-8	24	36	Buildout
12-277-12-298	24	36	Buildout
11-24-11-24A	24	36	Buildout
12-298-12-297	24	36	Buildout
12-278-12-277	24	36	Buildout
12-295-12-295A	24	36	Buildout
12-297-12-295	24	36	Buildout
12-295B-11-28	24	36	Buildout
11-24B-11-24A	8	24	Buildout
14-62B-14-63A	15	18	Buildout
14-63B-14-64A	15	18	Buildout
14-63A-14-63B	15	18	Buildout
14-64A-17-15	15	18	Buildout
8-57-7-41	12	18	Buildout
14-55-14-56	12	18	Buildout
7-50-7-52	12	18	Buildout
17-83-17-84	10	18	Buildout
14-41-14-42	10	15	Buildout
14-42-14-46	10	15	Buildout
13-63F-9-7	10	15	Buildout
4-174-4-173A	10	12	Buildout
4-85-4-84	10	12	Buildout
4-86-4-85	10	12	Buildout
4-90-4-89	10	12	Buildout
8-13-8-21A	10	12	Buildout

Pipe Name	Existing Diameter (in)	Proposed Diameter (in)	Upsize Year
14-38-14-37	8	12	Buildout
13-3-14-48B	8	12	Buildout
14-35-14-34	8	12	Buildout
17-73-17-74	8	12	Buildout
8-56-7-41	24	18	BuildoutA
9-7-9-2	10	15	BuildoutA

Note: Pipes denoted with 'A' at the end of the proposed upsize year were upsized to prevent constriction when upstream and/or downstream pipes were upsized and are not necessarily capacity limited

APPENDIX D

SEPA Checklist and Determination of Significance

#P71

CITY OF EDMONDS

ENVIRONMENTAL CHECKLIST

Purpose of Checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for Applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or does not apply". Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

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.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. **Name of proposed project, if applicable:** *City of Edmonds Comprehensive Sewer Plan*
2. **Name of applicant:** *City of Edmonds*
3. **Address and phone number of applicant and contact person:**
   Michele F. De Lilla, Senior Utilities Engineer, 121 5th Ave N, Edmonds, WA 98020, 425-771-0220
4. **Date checklist prepared:** *April 30, 2013*
5. **Agency requesting checklist:** *City of Edmonds*

6. **Proposed timing or schedule (including phasing, if applicable):**

The Edmonds City Council is likely to hold a public hearing on Sewer System Plan in June 2013. Projects in the Plan will be implemented over the twenty-year planning horizon.

(STAFF COMMENTS)_____

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

Yes. Capital improvements are identified in the plan and scheduled to occur over the next twnty years.

(STAFF COMMENTS)_____

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

SEPA checklist for adoption of the Comprehensive Sewer System Plan. Environmental review for projects identified in the plan will be conducted as necessary.

(STAFF COMMENTS)_____

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.

(STAFF COMMENTS)_____

10. **List any government approvals or permits that will be needed for your proposal, if known.**

Edmonds City Council Adoption

Approval from the Washington State Department of Commerce

(STAFF COMMENTS)_____

11. **Give brief, complete description of your proposal, including the proposed uses and 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.**

The Comprehensive Sewer System Plan is a planning document used to evaluate the City of Edmonds sewer system and plan future improvements for six and twenty-year planning horizons. The plan describes the water system in detail, including sources of water, treatment, and distribution. An improvement program is established based on projected system needs. The plan also looks at sewer system standards, operations and maintenance.

(STAFF COMMENTS)_____

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 range or boundaries of the site(s). Provide 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 City of Edmonds retail sewer service area is within the city limits with the boundary defined by the city limits, except for the southwest portion of the City that is served by the Olympic View Water & Sewer District. These limits are generally defined as the area that extends north to Meadowdale Beach Park, south to 244th Street SW along the Snohomish/King County boundary, and west to Puget Sound. The eastern boundary of the city limits generally follows Olympic View Drive, 76th Ave West, and Highway 99 except for a small portion of the city bounded on the west by Highway 99 and Lake Ballinger to the east between 220th Street SW and 244th Street SW.

(STAFF COMMENTS)_____

TO BE COMPLETED BY APPLICANT

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other:

The City's sewer service area is located in a relatively hilly portion of southwest Snohomish County. The highest elevation in the City is in the southeast corner at over 450 feet. The topography of the City's service generally slopes downward from east to west toward Puget Sound with the exception of the southeast corner of the service area which slopes toward Lake Ballinger.

(STAFF COMMENTS)_____

b. What is the steepest slope on the site (approximate percent slope)?

Greater than 40%.

(STAFF COMMENTS)_____

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, and muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

County soil survey mapping developed by the National Resource Conservation Service (NRCS) indicate that the predominant soils found across the City are Alderwood gravelly sand loam, Everett gravelly sandy loam, and Alderwood urban lan complex. Other soils with a much smaller extent include Kitsap silt loam, McKenna gravelly silt loam and Mukilteo muck.

(STAFF COMMENTS)_____

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Yes, particularly in the Earth Subsidence and Landslide Hazard Area in the Meadowdale Beach area of the City.

(STAFF COMMENTS)_____

e. Describe the purpose, type and approximate quantities of any filling or grading proposed. Indicate source of fill.

Not applicable.

(STAFF COMMENTS)_____

_____

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Minor erosion may occur during construction of system maintenance/improvement projects identified in the plan.

(STAFF COMMENTS)_____

_____

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Not applicable.

(STAFF COMMENTS)_____

_____

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Construction of temporary erosion and sediment control plans will be developed for construction activities and best management practices used to minimize and control erosion.

(STAFF COMMENTS)_____

_____

2. AIR

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, and industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Not applicable.

(STAFF COMMENTS)_____

_____

b. Are there any off-site sources of emissions or odor that may effect your proposal? If so, generally describe.

Not applicable.

(STAFF COMMENTS)_____

_____

c. Proposed measures to reduce or control emissions or other impacts to the, if any:

None.

(STAFF COMMENTS)_____

_____

3. WATER

a. Surface:

(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, and wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The City of Edmonds sits along the western shores of Puget Sound and contains a number of relatively small streams including Willow Creek, Shallabarger Creek, Shell Creek, Hindly Creek, Northstream, Fruitdale Creek, Perrinville Creek, Meadowdale Creek, and a number of smaller unnamed creeks. Portions of Lake Ballinger are also located within the City of Edmonds' jurisdiction.

(STAFF COMMENTS)_____

(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.**

No.

(STAFF COMMENTS)_____

(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.**

None.

(STAFF COMMENTS)_____

(4) **Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.**

No.

(STAFF COMMENTS)_____

(5) **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

There are limited areas within the city limits within the 100-year flood plain as identified on FEMA's Flood Insurance Rate Maps. Some areas identified include limited areas along Puget Sound, around Lake Ballinger, and the mouth of Shell Creek north of Caspers Street.

(STAFF COMMENTS)_____

(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.**

The City discharges treated wastewater effluent into Puget Sound under the terms of an NPDES municipal discharge permit with the Department of Ecology. Discharge in accordance with permit limits would continue under this Comprehensive Sewer Plan. Average annual daily flows through the treatment plant are expected to increase from 5.82 mgd in 2012 to 5.8 mgd in 2033. Where necessary, by-pass pumping will be implemented to maintain wastewater service in pipes to be upgraded.

(STAFF COMMENTS)_____

b. Ground:

(1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No.

(STAFF COMMENTS)_____

(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.

Not applicable.

(STAFF COMMENTS)_____

c. Water Runoff (including storm water):

(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.

Stormwater runoff from disturbed areas will be routed through erosion and sedimentation control facilities to prevent erosion and impacts to surface water in accordance with applicable erosion control ordinances. Future project and site-specific SEPA review will identify specific stormwater runoff sources, quantities, and collection and disposal methods for each specific project.

(STAFF COMMENTS)_____

(2) Could waste materials enter ground or surface waters? If so, generally describe.

It is unlikely that waste materials would enter ground or surface waters from any of the project components. A slight possibility exists that a small spill or release of fuel or oil from construction equipment could enter nearby surface waters. Future project and site-specific SEPA review will identify any potential for waste materials entering ground or surface waters and appropriate mitigation for each specific project component.

(STAFF COMMENTS)_____

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

None.

(STAFF COMMENTS)_____

4. **Plants**

a. **Check or circle types of vegetation found on the site:**

__X__ **deciduous tree: alder, maple, aspen, other:** _____

__X__ **evergreen tree: fir, cedar, pine, other:** _____

__X__ **shrubs** _____

__X__ **grass** _____

_____ **pasture** _____

_____ **crop or grain** _____

__X__ **wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other:** _____

__X__ **water plants: water lily, eelgrass, milfoil, other:** _____

_____ **other types of vegetation:** _____

(STAFF COMMENTS)_____

_____

_____

b. **What kind and amount of vegetation will be removed or altered?**

None.

(STAFF COMMENTS)_____

_____

_____

c. **List threatened or endangered species known to be on or near the site.**

No threatened or endangered plant species are known to be located within the City of Edmonds. Washington State Department of Natural Resources Natural Heritage site data do not show any rare, threatened, or endangered plant species in the City of Edmonds.

(STAFF COMMENTS)_____

_____

_____

d. **Proposed landscaping, use of native plants, or other materials to preserve or enhance vegetation on the site, if any:**

None.

(STAFF COMMENTS)_____

_____

_____

5. **Animals**

a. **Check or circle any birds and animals that have been observed on or near the site or are known to be on or near the site:**

__X__ **birds: hawk, heron, eagle, songbirds, other:** _____

_____ **mammals: deer, bear, elk, beaver, other:** _____

_____ **fish: bass, salmon, trout, herring, shellfish, other:** _____

(STAFF COMMENTS)_____

_____

_____

b. **List any threatened or endangered species known to be on or near the site.**

Puget Sound contains a number of threatened and endangered species including:

Southern Resident Killer Whale, (Orcinus orca)

Puget Sound DPS steelhead (Oncorhynchus mykiss)

Puget Sound ESU Chinook Salmon (Oncorhynchus tshawytscha)

Steller Sea Lion (Eumetopias jubatus)

(STAFF COMMENTS)_____

_____

_____

c. **Is the site part of a migration route? If so, explain.**

Edmonds is located within the Pacific Flyway.

(STAFF COMMENTS)_____

_____

_____

d. **Proposed measures to preserve or enhance wildlife, if any:**

None.

(STAFF COMMENTS)_____

_____

_____

6. **Energy and Natural Resources**

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.**

Electricity is needed to run the sewer treatment plant and the sewer pump stations.

(STAFF COMMENTS)_____

_____

_____

b. **Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

No.

(STAFF COMMENTS)_____

_____

_____

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:**

None.

(STAFF COMMENTS)_____

7. **Environmental Health**

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.**

None. Typical operation of a sewer system does not increase exposure to environmental health hazards.

(STAFF COMMENTS)_____

(1) **Describe special emergency services that might be required.**

None are anticipated.

(STAFF COMMENTS)_____

(2) **Proposed measures to reduce or control environmental health hazards, if any:**

No such measures are proposed.

(STAFF COMMENTS)_____

b. **Noise**

(1) **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

None.

(STAFF COMMENTS)_____

(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 hour's noise would come from the site.**

None.

(STAFF COMMENTS)_____

(3) **Proposed measures to reduce or control noise impacts, if any:**

None.

(STAFF COMMENTS)_____

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

Single-family residential uses are relatively evenly dispersed throughout the city and occupy the majority of the city's land use base. Approximately 3,100 acres or 55 percent of the City's area is developed for single-family residential uses. Higher density residential development (including apartments and condominiums) is primarily located south and north of the downtown; in the vicinity of the Edmonds-Woodway High School site and Swedish Hospital; and adjacent to 196th Street, 76th Avenue and Highway 99. Together, single family and multi-family residential units comprise approximately 3,400 acres (nearly 60 percent of the total land in the city).

Commercial activity is concentrated in two principal areas – the Downtown/Waterfront and the Highway 99 corridor (which includes retail and medical development in the vicinity of Swedish Hospital.) Smaller commercial nodes that primarily serve adjacent neighborhoods are located at the intersection of Edmonds Way (SR104) and 100th Avenue/9th Avenue (Westgate) and 212th Street/84th Avenue (5 Corners.)

The Port of Edmonds is located in the southern portion of the city's waterfront. The Port owns and manages 33 upland acres as well as a small boat harbor and marina, with space for 1,000 boats (approximately 11 acres). The Port's property is occupied by approximately 80 businesses including office uses in Harbor Square.

Approximately 258 acres of parks and open space lands are owned or operated by the City, while there are another 229 acres of County-owned parks and open space land in the Edmonds area. Regional parks and beaches figure prominently in the City, including Brackett's Landing North and South, the Edmonds Fishing Pier, Edmonds Memorial Cemetery, Edmonds Underwater Park, Marina Park Beach, Olympic Beach Park, local tidelands, and South County Senior Center. The Edmonds Marsh is a significant City-owned open space (23 acres), while Yost Memorial Park is the largest Park (120 acres) and Meadowdale Beach County Park (95 acres). Overall, approximately 96 percent of the city is developed.

(STAFF COMMENTS)_____

b. Has the site been used for agriculture? If so, describe.

No.

(STAFF COMMENTS)_____

c. Describe any structures on the site.

Typical urban development.

(STAFF COMMENTS)_____

d. Will any structures be demolished? If so, what?

No.

(STAFF COMMENTS)_____

e. **What is the current zoning classification of the site?**

Varies depending on location within the City of Edmonds.

(STAFF COMMENTS)_____

f. **What is the current comprehensive plan designation of the site?**

Varies depending on location within the City of Edmonds.

(STAFF COMMENTS)_____

g. **If applicable, what is the current shoreline master plan designation of the site?**

Varies depending on location within the City of Edmonds. Shoreline areas are along Puget Sound and Lake Ballinger.

(STAFF COMMENTS) Edmonds Marsh also in shoreline jurisdiction

h. **Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.**

Critical areas are defined in ECDC 23.40 through ECDC 23.90.

(STAFF COMMENTS)_____

i. **Approximately how many people would reside or work in the completed project?**

The City of Edmonds population is approximately 40,000. The population located within the City's conveyance (pipe) service area is approximately 34,000. The City's Wastewater Treatment Plant provides service also to portions of the Ronald Wastewater District, most of the City of Mountlake Terrace, and all of Olympic View Water Sewer District for a total population of approximately 100,000. Projected population within the piped service area at the end of the twenty-year planning horizon is 40,000 and for the WWTP is 120,000.

(STAFF COMMENTS)_____

j. **Approximately how many people would the completed project displace?**

None.

(STAFF COMMENTS)_____

k. **Proposed measures to avoid or reduce displacement impacts, if any:**

None.

(STAFF COMMENTS)_____

l. **Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:**

The plans and policies of the City of Edmonds and Snohomish County must be consistent with GMA pursuant to RCW 36.70A.100. The GMA also requires consistency with the implementation of Sewer System Plans and comprehensive plans pursuant to RCW 36.70A.120.

(STAFF COMMENTS)_____

9. Housing

a. **Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

None.

(STAFF COMMENTS)_____

b. **Approximately how many units, if any would be eliminated? Indicate whether high, middle, or low-income housing.**

None.

(STAFF COMMENTS)_____

c. **Proposed measures to reduce or control housing impacts, if any:**

None.

(STAFF COMMENTS)_____

10. Aesthetics

a. **What is the tallest height of any proposed structure(s), not including antennas; what is the principle exterior building material(s) proposed?**

The existing wastewater treatment plant is approximately 20 feet tall.

(STAFF COMMENTS)_____

b. **What views in the immediate vicinity would be altered or obstructed?**

None.

(STAFF COMMENTS)_____

c. **Proposed measures to reduce or control aesthetic impacts, if any:**

None.

(STAFF COMMENTS)_____

11. Light and Glare

a. **What type of light or glare will the proposal produce? What time of day would it mainly occur?**

None.

(STAFF COMMENTS)_____

b. **Could light or glare from the finished project be a safety hazard or interfere with views?**

None.

(STAFF COMMENTS)_____

c. **What existing off-site sources of light or glare may affect your proposal?**

None.

(STAFF COMMENTS)_____

d. **Proposed measures to reduce or control light and glare impacts, if any:**

None.

(STAFF COMMENTS)_____

12. Recreation

a. **What designated and informal recreational opportunities are in the immediate vicinity?**

A number of recreational opportunities are available through the City of Edmonds including a number of City Parks, a dive park, beaches along Puget Sound, and numerous festivals held in the City throughout the year.

(STAFF COMMENTS)_____

b. **Would the proposed project displace any existing recreation uses? If so, describe.**

No.

(STAFF COMMENTS)

c. **Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:**

None.

(STAFF COMMENTS)

13. Historic and Cultural Preservation

a. **Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.**

There are a number of placesand/or structures on the state and local historical registers which include several residences, a cemetery, and a Carnegie Library.

(STAFF COMMENTS)

b. **Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.**

None known.

(STAFF COMMENTS)

c. **Proposed measures to reduce or control impacts, if any:**

None.

(STAFF COMMENTS)

14. Transportation

a. **Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.**

Numerous streets throughout the City. Main arterials include State Route 104, State Route 564, and Highway 99.

(STAFF COMMENTS)_____

_____

_____

b. **Is site currently served by public transit? If no, what is the approximate distance to the nearest transit stop?**

Yes. Ferry, train, and bus.

(STAFF COMMENTS)_____

_____

_____

c. **How many parking spaces would the completed project have? How many would the project eliminate?**

None.

(STAFF COMMENTS)_____

_____

_____

d. **Will the proposal require any new roads, streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).**

No.

(STAFF COMMENTS)_____

_____

_____

e. **Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

The Sewer System Plan identifies a number of improvements to the system, including sewer main projects. The selection and implementation of these sewer main projects will be accomplished annually by the City, utilizing a priority ranking system. This provides the city with flexibility to coordinate sewer main projects with street or other projects that may be planned for the same area.

(STAFF COMMENTS)_____

_____

_____

f. **How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

None.

(STAFF COMMENTS)_____

_____

_____

g. **Proposed measures to reduce or control transportation impacts, if any:**

None.

(STAFF COMMENTS)_____

15. **Public Services**

a. **Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.**

No.

(STAFF COMMENTS)

b. **Proposed measures to reduce or control direct impacts on public services, if any:**

None.

(STAFF COMMENTS)

16. **Utilities**

a. **Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:**

All utilities are available within the City of Edmonds.

(STAFF COMMENTS)

b. **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.**

The Sewer System Plan describes how the City of Emonds will provide sewer services to its service area.

(STAFF COMMENTS)

C. SIGNATURE

I declare under penalty of perjury laws that the above answers are true and correct to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature of Proponent

5/21/2013

Date Submitted

Reviewed by 5-22-13

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(*do not 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?**

   Replacement of pipes and other repairs to the sewer system in the future will result in normal construction noise and construction vehicles and equipment would also temporarily increase emissions to the air.

   Proposal measures to avoid or reduce such increases are:

   Construction projects must comply with the City's noise abatement and control regulations in ECC 5.30.

2. **How would the proposal be likely to affect plants, animals, fish, or marine life?**

   The improvements recommended in the sewer system plan are not anticipated to affect plants, animals, fish, or marine life.

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:

   None.

3. **How would the proposal be likely to deplete energy or natural resources?**

   Water use within the service area is expected to grow with projected increases in population.

   Proposed measures to protect or conserve energy and natural resources are:

   Conservation measures will help reduce water use and treated water discharge.

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?**

   Neither the water system plan nor improvements recommended in the plan area anticipated to affect environmentally sensitive or protected areas.

   Proposed measures to protect such resources or to avoid or reduce impacts are:

   None.

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 sewer system plan is consistent with land use plans adopted by the City of Edmonds and Snohomish County and will not allow or encourage incompatible uses.

   Proposed measures to avoid or reduce shoreline and land use impacts are:

   None.

6. **How would the proposal be likely to increase demands on transportation or public services and utilities?**

   The improvements recommended in the sewer system plan area primarily infrastructure improvements of the existing system, although they are also planned to meet the anticipated needs of growth. The sewer system plan is not expected to increase demand.

Proposed measures to reduce or respond to such demand(s) are:

The Sewer Division has developed a preventive maintenance program to ensure all critical components of the water system are properly functioning and regularly maintained for long-term performance and reliability.

7. **Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.**

It is not anticipated that improvements recommended in the plan will conflict with existing regulations. All improvements will be coordinated with local, state, and federal agencies for appropriate permits.

CITY OF EDMONDS

121 5TH AVENUE NORTH, EDMONDS, WA 98020 (425) 771-0220

WAC 197-11-970 Determination of Nonsignificance (DNS)

DETERMINATION OF NONSIGNIFICANCE

Description of proposal: Adoption of the City of Edmonds Comprehensive Sewer Plan. the comprehensive Sewer System Plan is a planning document used to evaluate the City of Edmonds sewer system and plan future improvements for six and twenty-year planning horizons. The plan describes the City's sewer system in detail. The plan also looks at swere system standards, operations and maintenance. An improvement program is established based on projected needs.

Proponent: City of Edmonds

Location of proposal, including street address if any: City wide.

Lead agency: City of Edmonds

The lead agency has determined that the requirements for environmental analysis and protection have been adequately addressed in the development regulations and comprehensive plan adopted under chapter 36.70A RCW, and in other applicable local, state, or federal laws or rules, as provided by RCW 43.21C.240 and WAC 197-11-158 and/or mitigating measures have been applied that ensure no significant adverse impacts will be created.

An environmental impact statement is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

_____ There is no comment period for this DNS.

__XX__ This DNS is issued under 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by **June 7, 2014**.

Project Planner: Kernen Lien, Senior Planner

Responsible Official: Rob Chave, Planning Manager

Contact Information: City of Edmonds | 121 5th Avenue North, Edmonds WA 98020 | 425-771-0220

Date: May 22, 2013 **Signature:**

__XX__ You may appeal this determination to Robert Chave, Planning Manager, at 121 5th Avenue North, Edmonds, WA 98020, by filing a **written appeal** citing the specific reasons for the appeal with the required appeal fee, adjacent property owners list and notarized affidavit form no later than June 7, 2012. You should be prepared to make specific factual objections. Contact Rob Chave to read or ask about the procedures for SEPA appeals.

__XX__ Posted on May 24, 2012, at the Edmonds Public Library and Edmonds Public Safety Building. Published in the Everett Herald. Emailed to the Department of Ecology SEPA Center (SEPAunit@ecy.wa.gov). Mailed ot property owners within 300 feet of the site.

__XX__ Distribute to "Checked" Agencies below.

The SEPA Checklist, Comprehensive Plan Sewer Plan, and DNS are available at www.EdmondsWa.gov through the Permits Online link. Search for file number AMD20130006. These materials are also available for viewing at the Planning Division – located on the second floor of City Hall: 121 5th Avenue North, Edmonds WA 98020.

Mailed to the following along with the Environmental Checklist:

XX Environmental Review Section
Department of Ecology
P.O. Box 47703
Olympia, WA 98504-7703
Email: SEPAunit@ecy.wa.gov

XX COMCAST
Outside Plant Engineer, North Region
1525 75th St. SW Ste 200
Everett, WA 98203

XX Washington State Dept. of Transportation
Attn: Ramin Pazooki
SnoKing Developer Services, MS 221
15700 Dayton Ave. N.
PO Box 330310
Seattle, WA 98133-9710

XX Washington State Department of Health
Division of Drinking Water
P.O. Box 47822
Olympia, WA 98504-7822

XX Washington State Dept. of Commerce
906 Columbia Street SW
P.O. Box 48300
Olympia, WA 98504-8300

XX Puget Sound Partnership
P.O. Box 40900
Olympia, WA 98504-0900

XX Puget Sound Regional Council
Attn.: S.R.C.
1011 Western Avenue, Suite 500
Seattle, WA 98104-1035

XX Tulalip Tribal Council
6700 Totem Beach Road
Marysville, WA 98270

XX Snohomish County Planning & Development Services
3000 Rockefeller
Everett, WA 98201

XX Snohomish County Public Works
3000 Rockefeller M/S 607
Everett, WA 98201

XX Metro King County Environmental Planning
KSC-TR-0415
201 S. Jackson St.
Seattle, WA 98104-3856

XX City of Lynnwood
Attn.: Senior Planner
P.O. Box 5008
Lynnwood, WA 98046

XX City of Mountlake Terrace
Principle Planner
6100 219th St. SW, Suite 200
Mountlake Terrace, WA 98043

XX City of Shoreline
Attn.: Permit Services Manager
17500 Midvale Avenue North
Shoreline, WA 98133-4905

XX Town of Woodway
Attn.: Clerk-Treasurer
23920 113th Place West
Woodway, WA 98020

XX City of Mukilteo
11930 Cyrus Way
Mukilteo, WA 98275

XX Olympic View Water & Sewer District
8128 228th St. SW
Edmonds, WA 98026

XX Alderwood Water District
3626 156th Street Southwest
Lynnwood, WA 98037

XX Port of Edmonds
336 Admiral Way
Edmonds, WA 98020

XX Shoreline Water District
1519 NE 177th ST
Shoreline, WA 98155

XX Snohomish County Health District
Attn: Bruce Straughn
3020 Rocker Ave
Everett, WA 98201-3900

XX Puget Sound Energy
Attn: Elaine Babby
PO Box 97034, M/S EST-11W
Bellevue, WA 98009-9734

XX Kristin Kelly
Snohomish Co/Skagit Co Program Director
1429 Avenue D, PMB 532
Snohomish, WA 98290
kristin@futurewise.org

XX Department of Archaeology & Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343

Attachments

pc: File No.
SEPA Notebook

APPENDIX E

Cost Estimates

CIP Project No. A – Dayton and Maple at 5th
CIP Project No. B – West Lake Ballinger
CIP Project No. C – Along 7th Between Melody and Caspers
CIP Project No. D – Easement Extension of Main St between 83rd and 85th
CIP Project No. E – 6th Street between Walnut and Hemlock
CIP Project No. F – Alley between 3rd and 4th south of Howell
CIP Project No. G – 97th Street south of 216th
CIP Project No. H – Bowdoin west of 84th
CIP Project No. I – Easement between 6th and A Ave at Forsyth
CIP Project No. J – Bell Street between 4th and 5th
CIP Project No. K – SR 104 – two locations
CIP Project No. L – 3rd at Aloha and easements at 2nd Street
CIP Project No. M – 72nd north of 158th
CIP Project No. N – 5th Street at Holly and Forsyth
CIP Project No. O – 8th and Main and 8th and Holly
CIP Project No. P – 80th and 214th - easement
CIP Project No. Q – Park and 92nd
CIP Project No. R – Edmonds and 9th
CIP Project No. S – 9th and 216th
CIP Project No. T – Admiral and Dayton
CIP Project No. U – Easement 202nd & 77th and 203rd & 80th
CIP Project No. V – 72nd and 226th
CIP Project No. W – 100th and 225th
CIP Project No. X – 100th and 216th
CIP Project No. Y – 80th and 204th - easement
CIP Project No. Z – 73rd and 228th
CIP Project No. AA – 9th and 225th
CIP Project No.BB – 7th and Daley
CIP Project No. CC – 202nd and 75th
CIP Project No. DD – 180th and Kairez - easement
CIP Project No. EE – 216th and SR 99

CIP Project No. FF – 75th and 218th
CIP Project No. GG – Walnut and 10th
CIP Project No. HH – Pioneer and Shell Valley
CIP Project No. II – Maple and 93rd
CIP Project No. JJ – 75th and 162nd
CIP Project No. KK – Edmonds and 12th
CIP Project No. LL – Puget and Sound View - easement
CIP Project No. MM – SR 99 and 224th
CIP Project No. NN – Dayton and 3rd
CIP Project No. OO – 83rd and 204th
CIP Project No. PP – Sound View and Water
CIP Project No. QQ – 83rd and 202nd - easement
CIP Project No. RR – Maple and 10th
CIP Project No. SS – Walnut and 96th
CIP Project No. TT – Pine and SR 104
CIP Project No. UU – 75th and 165th
CIP Project No. VV – 7th and Bell
CIP Project No. WW – 8th and Driftwood - easement
CIP Project No. XX – 3rd and Walnut

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # A Dayton and Maple at 5th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 16,294	$ 16,294
2	Traffic Control Labor and Equipment	LS	1	$ 1,815	$ 1,815
3	Dewatering	LS	1	$ 1,815	$ 1,815
4	Sheeting, Shoring and Bracing	LS	1	$ 1,815	$ 1,815
5	Sawcutting Pavement	LF	1606	$ 4	$ 6,424
6	Pavement Removal	SY	527	$ 20	$ 10,537
7	Temporary Sewer Bypass	LS	1	$ 5,000	$ 5,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF	949	$ 31	$ 29,419
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF	363	$ 100	$ 36,300
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	22	$ 750	$ 16,500
20	Import Trench Backfill	TN	822	$ 20	$ 16,441
21	Crushed Surfacing, Base Course	TN	192	$ 25	$ 4,799
22	Crushed Surfacing, Top Course	TN	96	$ 25	$ 2,399
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	157	$ 140	$ 21,914
24	Pump Station - Mechanical	LS		$ 150,000	$ -
25	Pump Station - Electrical	LS		$ 50,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 4,655	$ 4,655
32	Cleanup and Testing	LS	1	$ 3,104	$ 3,104

Subtotal	$ 179,230
30% Contingency	$ 53,769
Subtotal	$ 232,999
9.0% State Sales Tax	$ 20,970
Estimated Total Construction Costs	**$ 253,969**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 30,476
Construction Services	$ 17,778
City Project Administration	$ 5,079
Legal	$ 2,540
Subtotal Project Allied Costs	**$ 55,873**

Total Estimated Project Costs	**$ 309,842**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # B West Lake Ballinger

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 111,126	$ 111,126
2	Traffic Control Labor and Equipment	LS	1	$ 5,000	$ 5,000
3	Dewatering	LS	1	$ 50,000	$ 50,000
4	Sheeting, Shoring and Bracing	LS	1	$ 13,985	$ 13,985
5	Sawcutting Pavement	LF	200	$ 4	$ 800
6	Pavement Removal	SY	60	$ 20	$ 1,200
7	Temporary Sewer Bypass	LS	1	$ 35,000	$ 35,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF	266	$ 130	$ 34,580
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	36-inch Sanitary Sewer	LF	2797	$ 250	$ 699,250
17	72-inch Dia Manhole, 0' to 8' deep	EA	10	$ 8,000	$ 80,000
18	72-inch Dia Manhole, extra depth	VF	20	$ 400	$ 8,000
19	Lateral Connection, 6-inch PVC	EA	40	$ 750	$ 30,000
20	Import Trench Backfill	TN	4508	$ 20	$ 90,155
21	Crushed Surfacing, Base Course	TN	90	$ 25	$ 2,250
22	Crushed Surfacing, Top Course	TN	45	$ 25	$ 1,125
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	50	$ 140	$ 7,000
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 31,750	$ 31,750
32	Cleanup and Testing	LS	1	$ 21,167	$ 21,167

Subtotal	$ 1,222,389
30% Contingency	$ 366,717
Subtotal	$ 1,589,106
9.0% State Sales Tax	$ 143,020
Estimated Total Construction Costs	**$ 1,732,125**

PROJECT ALLIED COSTS

Engineering Design, Survey, Geotechnical and Permits	$ 207,855
Construction Services	$ 121,249
City Project Administration	$ 34,643
Legal	$ 17,321
Subtotal Project Allied Costs	**$ 381,068**

Total Estimated Project Costs	**$ 2,113,193**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # C Along 7th Between Melody and Caspers

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 38,706	$ 38,706
2	Traffic Control Labor and Equipment	LS	1	$ 3,500	$ 3,500
3	Dewatering	LS	1	$ 25,000	$ 25,000
4	Sheeting, Shoring and Bracing	LS	1	$ 5,250	$ 5,250
5	Sawcutting Pavement	LF	400	$ 4	$ 1,600
6	Pavement Removal	SY	111	$ 20	$ 2,222
7	Temporary Sewer Bypass	LS	1	$ 9,000	$ 9,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF	1357	$ 130	$ 176,410
10	Pipe Bursting, Ex 15" to 21" Dia	LF	438	$ 180	$ 78,840
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA	9	$ 4,000	$ 36,000
18	48-inch Dia Manhole, extra depth	VF	20	$ 300	$ 6,000
19	Lateral Connection, 6-inch PVC	EA	21	$ 750	$ 15,750
20	Import Trench Backfill	TN	296	$ 20	$ 5,922
21	Crushed Surfacing, Base Course	TN	33	$ 25	$ 820
22	Crushed Surfacing, Top Course	TN	16	$ 25	$ 410
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	14	$ 140	$ 1,904
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 11,059	$ 11,059
32	Cleanup and Testing	LS	1	$ 7,373	$ 7,373

Subtotal	$ 425,765
30% Contingency	$ 127,730
Subtotal	$ 553,495
9.0% State Sales Tax	$ 49,815
Estimated Total Construction Costs	**$ 603,309**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 72,397
Construction Services	$ 42,232
City Project Administration	$ 12,066
Legal	$ 6,033
Subtotal Project Allied Costs	**$ 132,728**

Total Estimated Project Costs	**$ 736,038**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # D Easement Extension of Main St btwn 83rd/85th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 28,771	$ 28,771
2	Traffic Control Labor and Equipment	LS	1	$ 7,440	$ 7,440
3	Dewatering	LS	1	$ 7,440	$ 7,440
4	Sheeting, Shoring and Bracing	LS	1	$ 7,440	$ 7,440
5	Sawcutting Pavement	LF	80	$ 4	$ 320
6	Pavement Removal	SY	89	$ 20	$ 1,778
7	Temporary Sewer Bypass	LS	1	$ 7,440	$ 7,440
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	15-inch Sanitary Sewer	LF	1488	$ 110	$ 163,680
17	48-inch Dia Manhole, 0' to 8' deep	EA	5	$ 4,000	$ 20,000
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	16	$ 750	$ 12,000
20	Import Trench Backfill	TN	2324	$ 20	$ 46,474
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 8,220	$ 8,220
32	Cleanup and Testing	LS	1	$ 5,480	$ 5,480

Subtotal	$	316,483
30% Contingency	$	94,945
Subtotal	$	411,428
9.0% State Sales Tax	$	37,029
Estimated Total Construction Costs	**$**	**448,457**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	53,815
Construction Services	$	31,392
City Project Administration	$	8,969
Legal	$	4,485
Subtotal Project Allied Costs	**$**	**98,660**

Total Estimated Project Costs	**$**	**547,117**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # E 6th Street between Walnut and Hemlock

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 18,704	$ 18,704
2	Traffic Control Labor and Equipment	LS	1	$ 4,500	$ 4,500
3	Dewatering	LS	1	$ 4,500	$ 4,500
4	Sheeting, Shoring and Bracing	LS	1	$ 4,500	$ 4,500
5	Sawcutting Pavement	LF	1398	$ 4	$ 5,592
6	Pavement Removal	SY	686	$ 20	$ 13,718
7	Temporary Sewer Bypass	LS	1	$ 4,000	$ 4,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF	596	$ 100	$ 59,600
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	20	$ 750	$ 15,000
20	Import Trench Backfill	TN	1122	$ 20	$ 22,447
21	Crushed Surfacing, Base Course	TN	262	$ 25	$ 6,557
22	Crushed Surfacing, Top Course	TN	131	$ 25	$ 3,279
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	246	$ 140	$ 34,446
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 5,344	$ 5,344
32	Cleanup and Testing	LS	1	$ 3,563	$ 3,563

Subtotal	$	205,749
30% Contingency	$	61,725
Subtotal	$	267,474
9.0% State Sales Tax	$	24,073
Estimated Total Construction Costs	**$**	**291,547**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	34,986
Construction Services	$	20,408
City Project Administration	$	5,831
Legal	$	2,915
Subtotal Project Allied Costs	**$**	**64,140**

Total Estimated Project Costs	**$**	**355,687**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # F Alley between 3rd and 4th south of Howell

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,350	$ 2,350
2	Traffic Control Labor and Equipment	LS	1	$ 1,500	$ 1,500
3	Dewatering	LS	1	$ 1,500	$ 1,500
4	Sheeting, Shoring and Bracing	LS	1	$ 2,500	$ 2,500
5	Sawcutting Pavement	LF	240	$ 4	$ 960
6	Pavement Removal	SY	67	$ 20	$ 1,333
7	Temporary Sewer Bypass	LS	1	$ 1,500	$ 1,500
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	207	$ 27	$ 5,589
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	6	$ 750	$ 4,500
20	Import Trench Backfill	TN	85	$ 20	$ 1,692
21	Crushed Surfacing, Base Course	TN	20	$ 25	$ 492
22	Crushed Surfacing, Top Course	TN	10	$ 25	$ 246
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	4	$ 140	$ 571
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 672	$ 672
32	Cleanup and Testing	LS	1	$ 448	$ 448

Subtotal	$	25,853
30% Contingency	$	7,756
Subtotal	$	33,609
9.0% State Sales Tax	$	3,025
Estimated Total Construction Costs	**$**	**36,633**
PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	4,396
Construction Services	$	2,564
City Project Administration	$	733
Legal	$	366
Subtotal Project Allied Costs	**$**	**8,059**
Total Estimated Project Costs	**$**	**44,693**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # G 97th Street south of 216th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 5,493	$ 5,493
2	Traffic Control Labor and Equipment	LS	1	$ 3,750	$ 3,750
3	Dewatering	LS	1	$ 3,750	$ 3,750
4	Sheeting, Shoring and Bracing	LS	1	$ 3,750	$ 3,750
5	Sawcutting Pavement	LF	600	$ 4	$ 2,400
6	Pavement Removal	SY	167	$ 20	$ 3,333
7	Temporary Sewer Bypass	LS	1	$ 3,750	$ 3,750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	475	$ 27	$ 12,825
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	15	$ 750	$ 11,250
20	Import Trench Backfill	TN	212	$ 20	$ 4,230
21	Crushed Surfacing, Base Course	TN	49	$ 25	$ 1,230
22	Crushed Surfacing, Top Course	TN	25	$ 25	$ 615
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	10	$ 140	$ 1,428
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,569	$ 1,569
32	Cleanup and Testing	LS	1	$ 1,046	$ 1,046

Subtotal	$	60,420
30% Contingency	$	18,126
Subtotal	$	78,545
9.0% State Sales Tax	$	7,069
Estimated Total Construction Costs	**$**	**85,615**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	10,274
Construction Services	$	5,993
City Project Administration	$	1,712
Legal	$	856
Subtotal Project Allied Costs	**$**	**18,835**

Total Estimated Project Costs	**$**	**104,450**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # H Bowdoin west of 84th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,303	$ 2,303
2	Traffic Control Labor and Equipment	LS	1	$ 1,250	$ 1,250
3	Dewatering	LS	1	$ 1,250	$ 1,250
4	Sheeting, Shoring and Bracing	LS	1	$ 1,250	$ 1,250
5	Sawcutting Pavement	LF	200	$ 4	$ 800
6	Pavement Removal	SY	56	$ 20	$ 1,111
7	Temporary Sewer Bypass	LS	1	$ 1,250	$ 1,250
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	325	$ 27	$ 8,775
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	5	$ 750	$ 3,750
20	Import Trench Backfill	TN	71	$ 20	$ 1,410
21	Crushed Surfacing, Base Course	TN	16	$ 25	$ 410
22	Crushed Surfacing, Top Course	TN	8	$ 25	$ 205
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	3	$ 140	$ 476
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 658	$ 658
32	Cleanup and Testing	LS	1	$ 439	$ 439

Subtotal	$	25,337
30% Contingency	$	7,601
Subtotal	$	32,939
9.0% State Sales Tax	$	2,964
Estimated Total Construction Costs	**$**	**35,903**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	4,308
Construction Services	$	2,513
City Project Administration	$	718
Legal	$	359
Subtotal Project Allied Costs	**$**	**7,899**

Total Estimated Project Costs	**$**	**43,802**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # I Easement Between 6th and A Ave at Forsyt

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 1,535	$ 1,535
2	Traffic Control Labor and Equipment	LS	1	$ 500	$ 500
3	Dewatering	LS	1	$ 500	$ 500
4	Sheeting, Shoring and Bracing	LS	1	$ 500	$ 500
5	Sawcutting Pavement	LF	40	$ 4	$ 160
6	Pavement Removal	SY	22	$ 20	$ 444
7	Temporary Sewer Bypass	LS	1	$ 500	$ 500
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	319	$ 27	$ 8,613
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	2	$ 750	$ 1,500
20	Import Trench Backfill	TN	28	$ 20	$ 564
21	Crushed Surfacing, Base Course	TN	7	$ 25	$ 165
22	Crushed Surfacing, Top Course	TN	3	$ 25	$ 83
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	8	$ 140	$ 1,092
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 439	$ 439
32	Cleanup and Testing	LS	1	$ 292	$ 292

Subtotal	$	16,887
30% Contingency	$	5,066
Subtotal	$	21,953
9.0% State Sales Tax	$	1,976
Estimated Total Construction Costs	**$**	**23,928**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	2,871
Construction Services	$	1,675
City Project Administration	$	479
Legal	$	239
Subtotal Project Allied Costs	**$**	**5,264**

Total Estimated Project Costs	**$**	**29,193**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # J Bell Street Between 4th and 5th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 1,237	$ 1,237
2	Traffic Control Labor and Equipment	LS	1	$ 750	$ 750
3	Dewatering	LS	1	$ 750	$ 750
4	Sheeting, Shoring and Bracing	LS	1	$ 750	$ 750
5	Sawcutting Pavement	LF	120	$ 4	$ 480
6	Pavement Removal	SY	33	$ 20	$ 667
7	Temporary Sewer Bypass	LS	1	$ 750	$ 750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	144	$ 27	$ 3,888
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	3	$ 750	$ 2,250
20	Import Trench Backfill	TN	42	$ 20	$ 846
21	Crushed Surfacing, Base Course	TN	10	$ 25	$ 246
22	Crushed Surfacing, Top Course	TN	5	$ 25	$ 123
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	2	$ 140	$ 286
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 354	$ 354
32	Cleanup and Testing	LS	1	$ 236	$ 236

Subtotal	$	13,612
30% Contingency	$	4,084
Subtotal	$	17,695
9.0% State Sales Tax	$	1,593
Estimated Total Construction Costs	**$**	**19,288**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	2,315
Construction Services	$	1,350
City Project Administration	$	386
Legal	$	193
Subtotal Project Allied Costs	**$**	**4,243**

Total Estimated Project Costs	**$**	**23,531**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # K SR 104 - Two locations

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 32,631	$ 32,631
2	Traffic Control Labor and Equipment	LS	1	$ 20,000	$ 20,000
3	Dewatering	LS	1	$ 3,155	$ 3,155
4	Sheeting, Shoring and Bracing	LS	1	$ 3,155	$ 3,155
5	Sawcutting Pavement	LF	1502	$ 4	$ 6,008
6	Pavement Removal	SY	558	$ 20	$ 11,152
7	Temporary Sewer Bypass	LS	1	$ 6,000	$ 6,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	36-inch Sanitary Sewer	LF	631	$ 250	$ 157,750
17	72-inch Dia Manhole, 0' to 8' deep	EA	4	$ 8,000	$ 32,000
18	72-inch Dia Manhole, extra depth	VF	10	$ 400	$ 4,000
19	Lateral Connection, 6-inch PVC	EA	6	$ 750	$ 4,500
20	Import Trench Backfill	TN	974	$ 20	$ 19,486
21	Crushed Surfacing, Base Course	TN	228	$ 25	$ 5,698
22	Crushed Surfacing, Top Course	TN	114	$ 25	$ 2,849
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	250	$ 140	$ 35,024
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 9,323	$ 9,323
32	Cleanup and Testing	LS	1	$ 6,216	$ 6,216

Subtotal	$ 358,946
30% Contingency	$ 107,684
Subtotal	$ 466,630
9.0% State Sales Tax	$ 41,997
Estimated Total Construction Costs	**$ 508,627**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 61,035
Construction Services	$ 35,604
City Project Administration	$ 10,173
Legal	$ 5,086
Subtotal Project Allied Costs	**$ 111,898**

Total Estimated Project Costs	**$ 620,525**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # L 3rd at Aloha and easements at 2nd Street

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 26,653	$ 26,653
2	Traffic Control Labor and Equipment	LS	1	$ 2,000	$ 2,000
3	Dewatering	LS	1	$ 3,500	$ 3,500
4	Sheeting, Shoring and Bracing	LS	1	$ 3,500	$ 3,500
5	Sawcutting Pavement	LF	1062	$ 4	$ 4,248
6	Pavement Removal	SY	378	$ 20	$ 7,550
7	Temporary Sewer Bypass	LS	1	$ 5,000	$ 5,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 15" to 21" Dia	LF		$ 180	$ -
11	CIPP - 8-inch	LF	319	$ 27	$ 8,613
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	21-inch Sanitary Sewer	LF	652	$ 170	$ 110,840
17	72-inch Dia Manhole, 0' to 8' deep	EA	5	$ 8,000	$ 40,000
18	72-inch Dia Manhole, extra depth	VF	10	$ 400	$ 4,000
19	Lateral Connection, 6-inch PVC	EA	19	$ 750	$ 14,250
20	Import Trench Backfill	TN	1187	$ 20	$ 23,744
21	Crushed Surfacing, Base Course	TN	149	$ 25	$ 3,717
22	Crushed Surfacing, Top Course	TN	74	$ 25	$ 1,858
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	150	$ 140	$ 21,018
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 7,615	$ 7,615
32	Cleanup and Testing	LS	1	$ 5,077	$ 5,077

Subtotal	$	293,184
30% Contingency	$	87,955
Subtotal	$	381,139
9.0% State Sales Tax	$	34,303
Estimated Total Construction Costs	**$**	**415,442**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	49,853
Construction Services	$	29,081
City Project Administration	$	8,309
Legal	$	4,154
Subtotal Project Allied Costs	**$**	**91,397**

Total Estimated Project Costs	**$**	**506,839**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # M 72nd north of 158th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 7,850	$ 7,850
2	Traffic Control Labor and Equipment	LS	1	$ 1,485	$ 1,485
3	Dewatering	LS	1	$ 1,485	$ 1,485
4	Sheeting, Shoring and Bracing	LS	1	$ 1,485	$ 1,485
5	Sawcutting Pavement	LF	834	$ 4	$ 3,336
6	Pavement Removal	SY	298	$ 20	$ 5,955
7	Temporary Sewer Bypass	LS	1	$ 1,485	$ 1,485
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	297	$ 80	$ 23,760
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	6	$ 750	$ 4,500
20	Import Trench Backfill	TN	503	$ 20	$ 10,067
21	Crushed Surfacing, Base Course	TN	118	$ 25	$ 2,942
22	Crushed Surfacing, Top Course	TN	59	$ 25	$ 1,471
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	120	$ 140	$ 16,787
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,243	$ 2,243
32	Cleanup and Testing	LS	1	$ 1,495	$ 1,495

Subtotal	$	86,346
30% Contingency	$	25,904
Subtotal	$	112,250
9.0% State Sales Tax	$	10,103
Estimated Total Construction Costs	**$**	**122,353**

PROJECT ALLIED COSTS

Engineering Design, Survey, Geotechnical and Permits	$	14,682
Construction Services	$	8,565
City Project Administration	$	2,447
Legal	$	1,224
Subtotal Project Allied Costs	**$**	**26,918**

Total Estimated Project Costs	**$**	**149,270**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # N 5th Street at Holly and Forsyth

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 4,857	$ 4,857
2	Traffic Control Labor and Equipment	LS	1	$ 950	$ 950
3	Dewatering	LS	1	$ 950	$ 950
4	Sheeting, Shoring and Bracing	LS	1	$ 950	$ 950
5	Sawcutting Pavement	LF	498	$ 4	$ 1,992
6	Pavement Removal	SY	180	$ 20	$ 3,607
7	Temporary Sewer Bypass	LS	1	$ 950	$ 950
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	189	$ 80	$ 15,120
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	3	$ 750	$ 2,250
20	Import Trench Backfill	TN	309	$ 20	$ 6,176
21	Crushed Surfacing, Base Course	TN	72	$ 25	$ 1,805
22	Crushed Surfacing, Top Course	TN	36	$ 25	$ 903
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	76	$ 140	$ 10,605
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,388	$ 1,388
32	Cleanup and Testing	LS	1	$ 925	$ 925

Subtotal	$	53,428
30% Contingency	$	16,028
Subtotal	$	69,457
9.0% State Sales Tax	$	6,251
Estimated Total Construction Costs	**$**	**75,708**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	9,085
Construction Services	$	5,300
City Project Administration	$	1,514
Legal	$	757
Subtotal Project Allied Costs	**$**	**16,656**

Total Estimated Project Costs	**$**	**92,363**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # O 8th and Main & 8th and Holly

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 10,867	$ 10,867
2	Traffic Control Labor and Equipment	LS	1	$ 2,030	$ 2,030
3	Dewatering	LS	1	$ 2,030	$ 2,030
4	Sheeting, Shoring and Bracing	LS	1	$ 2,030	$ 2,030
5	Sawcutting Pavement	LF	1172	$ 4	$ 4,688
6	Pavement Removal	SY	416	$ 20	$ 8,317
7	Temporary Sewer Bypass	LS	1	$ 2,030	$ 2,030
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	406	$ 80	$ 32,480
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	9	$ 750	$ 6,750
20	Import Trench Backfill	TN	699	$ 20	$ 13,987
21	Crushed Surfacing, Base Course	TN	164	$ 25	$ 4,088
22	Crushed Surfacing, Top Course	TN	82	$ 25	$ 2,044
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	164	$ 140	$ 23,024
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 3,105	$ 3,105
32	Cleanup and Testing	LS	1	$ 2,070	$ 2,070

Subtotal	$ 119,540
30% Contingency	$ 35,862
Subtotal	$ 155,402
9.0% State Sales Tax	$ 13,986
Estimated Total Construction Costs	**$ 169,388**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 20,327
Construction Services	$ 11,857
City Project Administration	$ 3,388
Legal	$ 1,694
Subtotal Project Allied Costs	**$ 37,265**

Total Estimated Project Costs	**$ 206,654**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # P 80th and 214th - easement

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 6,424	$ 6,424
2	Traffic Control Labor and Equipment	LS	1	$ 1,100	$ 1,100
3	Dewatering	LS	1	$ 1,100	$ 1,100
4	Sheeting, Shoring and Bracing	LS	1	$ 1,100	$ 1,100
5	Sawcutting Pavement	LF	760	$ 4	$ 3,040
6	Pavement Removal	SY	260	$ 20	$ 5,201
7	Temporary Sewer Bypass	LS	1	$ 1,100	$ 1,100
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	220	$ 80	$ 17,600
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	8	$ 750	$ 6,000
20	Import Trench Backfill	TN	423	$ 20	$ 8,460
21	Crushed Surfacing, Base Course	TN	99	$ 25	$ 2,471
22	Crushed Surfacing, Top Course	TN	49	$ 25	$ 1,236
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	91	$ 140	$ 12,774
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,835	$ 1,835
32	Cleanup and Testing	LS	1	$ 1,224	$ 1,224

Subtotal	$	70,664
30% Contingency	$	21,199
Subtotal	$	91,863
9.0% State Sales Tax	$	8,268
Estimated Total Construction Costs	**$**	**100,131**

PROJECT ALLIED COSTS

Engineering Design, Survey, Geotechnical and Permits	$	12,016
Construction Services	$	7,009
City Project Administration	$	2,003
Legal	$	1,001
Subtotal Project Allied Costs	**$**	**22,029**

Total Estimated Project Costs	**$**	**122,160**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # Q Park and 92nd

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 1,993	$ 1,993
2	Traffic Control Labor and Equipment	LS		$ 545	$ -
3	Dewatering	LS	1	$ 750	$ 750
4	Sheeting, Shoring and Bracing	LS	1	$ 750	$ 750
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 750	$ 750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	247	$ 27	$ 6,669
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	3	$ 750	$ 2,250
20	Import Trench Backfill	TN	391	$ 20	$ 7,811
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 569	$ 569
32	Cleanup and Testing	LS	1	$ 380	$ 380

Subtotal	$	21,922
30% Contingency	$	6,577
Subtotal	$	28,499
9.0% State Sales Tax	$	2,565
Estimated Total Construction Costs	**$**	**31,064**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	3,728
Construction Services	$	2,174
City Project Administration	$	621
Legal	$	311
Subtotal Project Allied Costs	**$**	**6,834**

Total Estimated Project Costs	**$**	**37,898**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # R Edmonds and 9th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,550	$ 2,550
2	Traffic Control Labor and Equipment	LS	1	$ 1,750	$ 1,750
3	Dewatering	LS	1	$ 1,750	$ 1,750
4	Sheeting, Shoring and Bracing	LS	1	$ 1,750	$ 1,750
5	Sawcutting Pavement	LF	280	$ 4	$ 1,120
6	Pavement Removal	SY	78	$ 20	$ 1,555
7	Temporary Sewer Bypass	LS	1	$ 1,750	$ 1,750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	217	$ 27	$ 5,859
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	7	$ 750	$ 5,250
20	Import Trench Backfill	TN	99	$ 20	$ 1,974
21	Crushed Surfacing, Base Course	TN	23	$ 25	$ 574
22	Crushed Surfacing, Top Course	TN	11	$ 25	$ 287
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	5	$ 140	$ 666
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 729	$ 729
32	Cleanup and Testing	LS	1	$ 486	$ 486

Subtotal	$	28,050
30% Contingency	$	8,415
Subtotal	$	36,465
9.0% State Sales Tax	$	3,282
Estimated Total Construction Costs	**$**	**39,747**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	4,770
Construction Services	$	2,782
City Project Administration	$	795
Legal	$	397
Subtotal Project Allied Costs	**$**	**8,744**

Total Estimated Project Costs	**$**	**48,491**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # S 9th and 216th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 3,363	$ 3,363
2	Traffic Control Labor and Equipment	LS	1	$ 550	$ 550
3	Dewatering	LS	1	$ 550	$ 550
4	Sheeting, Shoring and Bracing	LS	1	$ 550	$ 550
5	Sawcutting Pavement	LF	418	$ 4	$ 1,672
6	Pavement Removal	SY	140	$ 20	$ 2,807
7	Temporary Sewer Bypass	LS	1	$ 550	$ 550
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	109	$ 80	$ 8,720
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	5	$ 750	$ 3,750
20	Import Trench Backfill	TN	224	$ 20	$ 4,484
21	Crushed Surfacing, Base Course	TN	52	$ 25	$ 1,309
22	Crushed Surfacing, Top Course	TN	26	$ 25	$ 655
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	46	$ 140	$ 6,427
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 961	$ 961
32	Cleanup and Testing	LS	1	$ 640	$ 640

Subtotal	$	36,988
30% Contingency	$	11,096
Subtotal	$	48,084
9.0% State Sales Tax	$	4,328
Estimated Total Construction Costs	**$**	**52,412**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	6,289
Construction Services	$	3,669
City Project Administration	$	1,048
Legal	$	524
Subtotal Project Allied Costs	**$**	**11,531**

Total Estimated Project Costs	**$**	**63,942**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # T Admiral and Dayton

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 6,063	$ 6,063
2	Traffic Control Labor and Equipment	LS	1	$ 5,000	$ 5,000
3	Dewatering	LS	1	$ 1,000	$ 1,000
4	Sheeting, Shoring and Bracing	LS	1	$ 1,000	$ 1,000
5	Sawcutting Pavement	LF	642	$ 4	$ 2,568
6	Pavement Removal	SY	223	$ 20	$ 4,461
7	Temporary Sewer Bypass	LS	1	$ 1,000	$ 1,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	201	$ 80	$ 16,080
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	6	$ 750	$ 4,500
20	Import Trench Backfill	TN	368	$ 20	$ 7,360
21	Crushed Surfacing, Base Course	TN	86	$ 25	$ 2,150
22	Crushed Surfacing, Top Course	TN	43	$ 25	$ 1,075
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	82	$ 140	$ 11,546
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,732	$ 1,732
32	Cleanup and Testing	LS	1	$ 1,155	$ 1,155

Subtotal	$	66,690
30% Contingency	$	20,007
Subtotal	$	86,697
9.0% State Sales Tax	$	7,803
Estimated Total Construction Costs	**$**	**94,500**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	11,340
Construction Services	$	6,615
City Project Administration	$	1,890
Legal	$	945
Subtotal Project Allied Costs	**$**	**20,790**

Total Estimated Project Costs	**$**	**115,289**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # U Easement 202nd & 77th and 203rd & 80th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 8,346	$ 8,346
2	Traffic Control Labor and Equipment	LS	1	$ 1,750	$ 1,750
3	Dewatering	LS	1	$ 1,750	$ 1,750
4	Sheeting, Shoring and Bracing	LS	1	$ 1,750	$ 1,750
5	Sawcutting Pavement	LF	1118	$ 4	$ 4,472
6	Pavement Removal	SY	404	$ 20	$ 8,075
7	Temporary Sewer Bypass	LS	1	$ 1,750	$ 1,750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	419	$ 27	$ 11,313
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	7	$ 750	$ 5,250
20	Import Trench Backfill	TN	689	$ 20	$ 13,790
21	Crushed Surfacing, Base Course	TN	161	$ 25	$ 4,031
22	Crushed Surfacing, Top Course	TN	81	$ 25	$ 2,015
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	168	$ 140	$ 23,544
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,385	$ 2,385
32	Cleanup and Testing	LS	1	$ 1,590	$ 1,590

Subtotal	$	91,811
30% Contingency	$	27,543
Subtotal	$	119,354
9.0% State Sales Tax	$	10,742
Estimated Total Construction Costs	**$**	**130,096**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	15,611
Construction Services	$	9,107
City Project Administration	$	2,602
Legal	$	1,301
Subtotal Project Allied Costs	**$**	**28,621**

Total Estimated Project Costs	**$**	**158,717**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # V 72nd and 226th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 8,990	$ 8,990
2	Traffic Control Labor and Equipment	LS	1	$ 2,000	$ 2,000
3	Dewatering	LS	1	$ 2,000	$ 2,000
4	Sheeting, Shoring and Bracing	LS	1	$ 2,000	$ 2,000
5	Sawcutting Pavement	LF	1206	$ 4	$ 4,824
6	Pavement Removal	SY	434	$ 20	$ 8,671
7	Temporary Sewer Bypass	LS	1	$ 2,000	$ 2,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 18" Dia	LF		$ 180	$ -
11	CIPP - 8-inch	LF	443	$ 27	$ 11,961
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	8	$ 750	$ 6,000
20	Import Trench Backfill	TN	737	$ 20	$ 14,749
21	Crushed Surfacing, Base Course	TN	172	$ 25	$ 4,311
22	Crushed Surfacing, Top Course	TN	86	$ 25	$ 2,155
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	178	$ 140	$ 24,949
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,569	$ 2,569
32	Cleanup and Testing	LS	1	$ 1,712	$ 1,712

Subtotal	$	98,891
30% Contingency	$	29,667
Subtotal	$	128,558
9.0% State Sales Tax	$	11,570
Estimated Total Construction Costs	**$**	**140,128**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	16,815
Construction Services	$	9,809
City Project Administration	$	2,803
Legal	$	1,401
Subtotal Project Allied Costs	**$**	**30,828**

Total Estimated Project Costs	**$**	**170,957**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # W 100th and 225th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 6,094	$ 6,094
2	Traffic Control Labor and Equipment	LS	1	$ 1,250	$ 1,250
3	Dewatering	LS	1	$ 1,250	$ 1,250
4	Sheeting, Shoring and Bracing	LS	1	$ 1,250	$ 1,250
5	Sawcutting Pavement	LF	808	$ 4	$ 3,232
6	Pavement Removal	SY	292	$ 20	$ 5,841
7	Temporary Sewer Bypass	LS	1	$ 1,250	$ 1,250
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	304	$ 27	$ 8,208
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	5	$ 750	$ 3,750
20	Import Trench Backfill	TN	499	$ 20	$ 9,983
21	Crushed Surfacing, Base Course	TN	132	$ 25	$ 3,298
22	Crushed Surfacing, Top Course	TN	66	$ 25	$ 1,649
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	122	$ 140	$ 17,074
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,741	$ 1,741
32	Cleanup and Testing	LS	1	$ 1,161	$ 1,161

Subtotal	$	67,031
30% Contingency	$	20,109
Subtotal	$	87,140
9.0% State Sales Tax	$	7,843
Estimated Total Construction Costs	**$**	**94,983**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	11,398
Construction Services	$	6,649
City Project Administration	$	1,900
Legal	$	950
Subtotal Project Allied Costs	**$**	**20,896**

Total Estimated Project Costs	**$**	**115,879**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # X 100th and 216th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 6,688	$ 6,688
2	Traffic Control Labor and Equipment	LS	1	$ 2,700	$ 2,700
3	Dewatering	LS	1	$ 2,700	$ 2,700
4	Sheeting, Shoring and Bracing	LS	1	$ 2,700	$ 2,700
5	Sawcutting Pavement	LF	378	$ 4	$ 1,512
6	Pavement Removal	SY	134	$ 20	$ 2,674
7	Temporary Sewer Bypass	LS	1	$ 2,700	$ 2,700
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	288	$ 27	$ 7,776
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	197	$ 80	$ 15,760
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	10	$ 750	$ 7,500
20	Import Trench Backfill	TN	419	$ 20	$ 8,375
21	Crushed Surfacing, Base Course	TN	52	$ 25	$ 1,310
22	Crushed Surfacing, Top Course	TN	26	$ 25	$ 655
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	52	$ 140	$ 7,329
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,911	$ 1,911
32	Cleanup and Testing	LS	1	$ 1,274	$ 1,274

Subtotal	$ 73,564
30% Contingency	$ 22,069
Subtotal	$ 95,633
9.0% State Sales Tax	$ 8,607
Estimated Total Construction Costs	**$ 104,240**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 12,509
Construction Services	$ 7,297
City Project Administration	$ 2,085
Legal	$ 1,042
Subtotal Project Allied Costs	**$ 22,933**

Total Estimated Project Costs	**$ 127,173**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # Y 80th and 204th - easement

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,092	$ 2,092
2	Traffic Control Labor and Equipment	LS	1		$ -
3	Dewatering	LS	1	$ 725	$ 725
4	Sheeting, Shoring and Bracing	LS	1	$ 725	$ 725
5	Sawcutting Pavement	LF	0	$ 4	$ -
6	Pavement Removal	SY	0	$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 725	$ 725
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	145	$ 80	$ 11,600
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	2	$ 750	$ 1,500
20	Import Trench Backfill	TN	233	$ 20	$ 4,653
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN		$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 598	$ 598
32	Cleanup and Testing	LS	1	$ 399	$ 399

Subtotal	$	23,017
30% Contingency	$	6,905
Subtotal	$	29,922
9.0% State Sales Tax	$	2,693
Estimated Total Construction Costs	**$**	**32,615**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	3,914
Construction Services	$	2,283
City Project Administration	$	652
Legal	$	326
Subtotal Project Allied Costs	**$**	**7,175**

Total Estimated Project Costs	**$**	**39,790**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # Z 73rd and 228th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 9,988	$ 9,988
2	Traffic Control Labor and Equipment	LS	1	$ 3,875	$ 3,875
3	Dewatering	LS	1	$ 3,875	$ 3,875
4	Sheeting, Shoring and Bracing	LS	1	$ 3,875	$ 3,875
5	Sawcutting Pavement	LF	950	$ 4	$ 3,800
6	Pavement Removal	SY	303	$ 20	$ 6,056
7	Temporary Sewer Bypass	LS	1	$ 3,875	$ 3,875
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	754	$ 27	$ 20,358
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	175	$ 80	$ 14,000
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	15	$ 750	$ 11,250
20	Import Trench Backfill	TN	458	$ 20	$ 9,165
21	Crushed Surfacing, Base Course	TN	107	$ 25	$ 2,674
22	Crushed Surfacing, Top Course	TN	53	$ 25	$ 1,337
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	78	$ 140	$ 10,983
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,854	$ 2,854
32	Cleanup and Testing	LS	1	$ 1,902	$ 1,902

Subtotal	$	109,867
30% Contingency	$	32,960
Subtotal	$	142,827
9.0% State Sales Tax	$	12,854
Estimated Total Construction Costs	**$**	**155,681**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	18,682
Construction Services	$	10,898
City Project Administration	$	3,114
Legal	$	1,557
Subtotal Project Allied Costs	**$**	**34,250**

Total Estimated Project Costs	**$**	**189,931**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # AA 9th and 225th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 1,222	$ 1,222
2	Traffic Control Labor and Equipment	LS	1	$ 750	$ 750
3	Dewatering	LS	1	$ 750	$ 750
4	Sheeting, Shoring and Bracing	LS	1	$ 750	$ 750
5	Sawcutting Pavement	LF	120	$ 4	$ 480
6	Pavement Removal	SY	33	$ 20	$ 667
7	Temporary Sewer Bypass	LS	1	$ 750	$ 750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	128	$ 27	$ 3,456
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	3	$ 750	$ 2,250
20	Import Trench Backfill	TN	42	$ 20	$ 846
21	Crushed Surfacing, Base Course	TN	10	$ 25	$ 246
22	Crushed Surfacing, Top Course	TN	5	$ 25	$ 123
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	4	$ 140	$ 571
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 349	$ 349
32	Cleanup and Testing	LS	1	$ 233	$ 233

Subtotal	$	13,443
30% Contingency	$	4,033
Subtotal	$	17,476
9.0% State Sales Tax	$	1,573
Estimated Total Construction Costs	**$**	**19,048**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	2,286
Construction Services	$	1,333
City Project Administration	$	381
Legal	$	190
Subtotal Project Allied Costs	**$**	**4,191**

Total Estimated Project Costs	**$**	**23,239**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # BB 7th and Daley

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,555	$ 2,555
2	Traffic Control Labor and Equipment	LS	1	$ 1,000	$ 1,000
3	Dewatering	LS	1	$ 1,000	$ 1,000
4	Sheeting, Shoring and Bracing	LS	1	$ 1,000	$ 1,000
5	Sawcutting Pavement	LF	160	$ 4	$ 640
6	Pavement Removal	SY	44	$ 20	$ 889
7	Temporary Sewer Bypass	LS	1	$ 1,000	$ 1,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	497	$ 27	$ 13,419
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	4	$ 750	$ 3,000
20	Import Trench Backfill	TN	56	$ 20	$ 1,128
21	Crushed Surfacing, Base Course	TN	13	$ 25	$ 328
22	Crushed Surfacing, Top Course	TN	7	$ 25	$ 164
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	5	$ 140	$ 762
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 730	$ 730
32	Cleanup and Testing	LS	1	$ 487	$ 487

Subtotal	$	28,100
30% Contingency	$	8,430
Subtotal	$	36,531
9.0% State Sales Tax	$	3,288
Estimated Total Construction Costs	**$**	**39,818**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	4,778
Construction Services	$	2,787
City Project Administration	$	796
Legal	$	398
Subtotal Project Allied Costs	**$**	**8,760**

Total Estimated Project Costs	**$**	**48,578**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # CC 202nd and 75th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,024	$ 2,024
2	Traffic Control Labor and Equipment	LS		$ 1,500	$ -
3	Dewatering	LS	1	$ 1,500	$ 1,500
4	Sheeting, Shoring and Bracing	LS	1	$ 1,500	$ 1,500
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 1,500	$ 1,500
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	318	$ 27	$ 8,586
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	6	$ 750	$ 4,500
20	Import Trench Backfill	TN	85	$ 20	$ 1,692
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 578	$ 578
32	Cleanup and Testing	LS	1	$ 386	$ 386

Subtotal	$	22,266
30% Contingency	$	6,680
Subtotal	$	28,946
9.0% State Sales Tax	$	2,605
Estimated Total Construction Costs	**$**	**31,551**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	3,786
Construction Services	$	2,209
City Project Administration	$	631
Legal	$	316
Subtotal Project Allied Costs	**$**	**6,941**

Total Estimated Project Costs	**$**	**38,492**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # DD 180th and Kairez - easement

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 1,467	$ 1,467
2	Traffic Control Labor and Equipment	LS			$ -
3	Dewatering	LS	1	$ 525	$ 525
4	Sheeting, Shoring and Bracing	LS	1	$ 525	$ 525
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 525	$ 525
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	105	$ 80	$ 8,400
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	1	$ 750	$ 750
20	Import Trench Backfill	TN	162	$ 20	$ 3,243
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 419	$ 419
32	Cleanup and Testing	LS	1	$ 279	$ 279

Subtotal	$	16,133
30% Contingency	$	4,840
Subtotal	$	20,973
9.0% State Sales Tax	$	1,888
Estimated Total Construction Costs	**$**	**22,861**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	2,743
Construction Services	$	1,600
City Project Administration	$	457
Legal	$	229
Subtotal Project Allied Costs	**$**	**5,029**

Total Estimated Project Costs	**$**	**27,890**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # EE 216th and SR 99

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,783	$ 2,783
2	Traffic Control Labor and Equipment	LS	1	$ 10,000	$ 10,000
3	Dewatering	LS	1	$ 750	$ 750
4	Sheeting, Shoring and Bracing	LS	1	$ 750	$ 750
5	Sawcutting Pavement	LF	120	$ 4	$ 480
6	Pavement Removal	SY	33	$ 20	$ 667
7	Temporary Sewer Bypass	LS	1	$ 750	$ 750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	336	$ 27	$ 9,072
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	3	$ 750	$ 2,250
20	Import Trench Backfill	TN	42	$ 20	$ 846
21	Crushed Surfacing, Base Course	TN	10	$ 25	$ 246
22	Crushed Surfacing, Top Course	TN	5	$ 25	$ 123
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	4	$ 140	$ 571
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 795	$ 795
32	Cleanup and Testing	LS	1	$ 530	$ 530

Subtotal	$	30,613
30% Contingency	$	9,184
Subtotal	$	39,797
9.0% State Sales Tax	$	3,582
Estimated Total Construction Costs	**$**	**43,379**
PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	5,205
Construction Services	$	3,037
City Project Administration	$	868
Legal	$	434
Subtotal Project Allied Costs	**$**	**9,543**
Total Estimated Project Costs	**$**	**52,922**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # FF 75th and 218th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 5,728	$ 5,728
2	Traffic Control Labor and Equipment	LS	1	$ 1,000	$ 1,000
3	Dewatering	LS	1	$ 1,000	$ 1,000
4	Sheeting, Shoring and Bracing	LS	1	$ 1,000	$ 1,000
5	Sawcutting Pavement	LF	160	$ 4	$ 640
6	Pavement Removal	SY	44	$ 20	$ 889
7	Temporary Sewer Bypass	LS	1	$ 2,000	$ 2,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF	328	$ 130	$ 42,640
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	4	$ 750	$ 3,000
20	Import Trench Backfill	TN	56	$ 20	$ 1,128
21	Crushed Surfacing, Base Course	TN	13	$ 25	$ 328
22	Crushed Surfacing, Top Course	TN	7	$ 25	$ 164
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	5	$ 140	$ 762
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,637	$ 1,637
32	Cleanup and Testing	LS	1	$ 1,091	$ 1,091

Subtotal	$	63,006
30% Contingency	$	18,902
Subtotal	$	81,907
9.0% State Sales Tax	$	7,372
Estimated Total Construction Costs	**$**	**89,279**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	10,713
Construction Services	$	6,250
City Project Administration	$	1,786
Legal	$	893
Subtotal Project Allied Costs	**$**	**19,641**

Total Estimated Project Costs	**$**	**108,920**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # GG Walnut and 10th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 8,110	$ 8,110
2	Traffic Control Labor and Equipment	LS	1	$ 1,310	$ 1,310
3	Dewatering	LS	1	$ 1,310	$ 1,310
4	Sheeting, Shoring and Bracing	LS	1	$ 1,310	$ 1,310
5	Sawcutting Pavement	LF	884	$ 4	$ 3,536
6	Pavement Removal	SY	304	$ 20	$ 6,077
7	Temporary Sewer Bypass	LS	1	$ 1,310	$ 1,310
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF	262	$ 100	$ 26,200
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	9	$ 750	$ 6,750
20	Import Trench Backfill	TN	496	$ 20	$ 9,926
21	Crushed Surfacing, Base Course	TN	116	$ 25	$ 2,900
22	Crushed Surfacing, Top Course	TN	58	$ 25	$ 1,450
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	108	$ 140	$ 15,162
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,317	$ 2,317
32	Cleanup and Testing	LS	1	$ 1,545	$ 1,545

Subtotal	$	89,212
30% Contingency	$	26,764
Subtotal	$	115,976
9.0% State Sales Tax	$	10,438
Estimated Total Construction Costs	**$**	**126,414**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	15,170
Construction Services	$	8,849
City Project Administration	$	2,528
Legal	$	1,264
Subtotal Project Allied Costs	**$**	**27,811**

Total Estimated Project Costs	**$**	**154,225**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # HH Pioneer and Shell Valley

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 8,419	$ 8,419
2	Traffic Control Labor and Equipment	LS	1	$ 1,340	$ 1,340
3	Dewatering	LS	1	$ 1,340	$ 1,340
4	Sheeting, Shoring and Bracing	LS	1	$ 1,340	$ 1,340
5	Sawcutting Pavement	LF	736	$ 4	$ 2,944
6	Pavement Removal	SY	264	$ 20	$ 5,281
7	Temporary Sewer Bypass	LS	1	$ 1,340	$ 1,340
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	15-inch Sanitary Sewer	LF	268	$ 130	$ 34,840
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	5	$ 750	$ 3,750
20	Import Trench Backfill	TN	448	$ 20	$ 8,968
21	Crushed Surfacing, Base Course	TN	105	$ 25	$ 2,621
22	Crushed Surfacing, Top Course	TN	52	$ 25	$ 1,311
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	108	$ 140	$ 15,109
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,405	$ 2,405
32	Cleanup and Testing	LS	1	$ 1,604	$ 1,604

Subtotal	$	92,611
30% Contingency	$	27,783
Subtotal	$	120,395
9.0% State Sales Tax	$	10,836
Estimated Total Construction Costs	**$**	**131,230**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	15,748
Construction Services	$	9,186
City Project Administration	$	2,625
Legal	$	1,312
Subtotal Project Allied Costs	**$**	**28,871**

Total Estimated Project Costs	**$**	**160,101**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # II Maple and 93rd

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 15,257	$ 15,257
2	Traffic Control Labor and Equipment	LS	1	$ 3,105	$ 3,105
3	Dewatering	LS	1	$ 3,105	$ 3,105
4	Sheeting, Shoring and Bracing	LS	1	$ 3,105	$ 3,105
5	Sawcutting Pavement	LF	1322	$ 4	$ 5,288
6	Pavement Removal	SY	505	$ 20	$ 10,107
7	Temporary Sewer Bypass	LS	1	$ 3,105	$ 3,105
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF	621	$ 90	$ 55,890
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	2	$ 750	$ 1,500
20	Import Trench Backfill	TN	904	$ 20	$ 18,076
21	Crushed Surfacing, Base Course	TN	211	$ 25	$ 5,287
22	Crushed Surfacing, Top Course	TN	106	$ 25	$ 2,644
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	244	$ 140	$ 34,097
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 4,359	$ 4,359
32	Cleanup and Testing	LS	1	$ 2,906	$ 2,906

Subtotal	$ 167,832
30% Contingency	$ 50,350
Subtotal	$ 218,182
9.0% State Sales Tax	$ 19,636
Estimated Total Construction Costs	**$ 237,818**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 28,538
Construction Services	$ 16,647
City Project Administration	$ 4,756
Legal	$ 2,378
Subtotal Project Allied Costs	**$ 52,320**

Total Estimated Project Costs	**$ 290,138**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # JJ 75th and 162nd

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 5,772	$ 5,772
2	Traffic Control Labor and Equipment	LS	1	$ 1,070	$ 1,070
3	Dewatering	LS	1	$ 1,070	$ 1,070
4	Sheeting, Shoring and Bracing	LS	1	$ 1,070	$ 1,070
5	Sawcutting Pavement	LF	628	$ 4	$ 2,512
6	Pavement Removal	SY	222	$ 20	$ 4,441
7	Temporary Sewer Bypass	LS	1	$ 1,070	$ 1,070
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	214	$ 80	$ 17,120
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	5	$ 750	$ 3,750
20	Import Trench Backfill	TN	372	$ 20	$ 7,445
21	Crushed Surfacing, Base Course	TN	87	$ 25	$ 2,176
22	Crushed Surfacing, Top Course	TN	44	$ 25	$ 1,088
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	87	$ 140	$ 12,160
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,649	$ 1,649
32	Cleanup and Testing	LS	1	$ 1,099	$ 1,099

Subtotal	$	63,492
30% Contingency	$	19,048
Subtotal	$	82,539
9.0% State Sales Tax	$	7,429
Estimated Total Construction Costs	**$**	**89,968**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	10,796
Construction Services	$	6,298
City Project Administration	$	1,799
Legal	$	900
Subtotal Project Allied Costs	**$**	**19,793**

Total Estimated Project Costs	**$**	**109,761**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # KK Edmonds and 12th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 7,207	$ 7,207
2	Traffic Control Labor and Equipment	LS	1	$ 1,345	$ 1,345
3	Dewatering	LS	1	$ 1,345	$ 1,345
4	Sheeting, Shoring and Bracing	LS	1	$ 1,345	$ 1,345
5	Sawcutting Pavement	LF	778	$ 4	$ 3,112
6	Pavement Removal	SY	276	$ 20	$ 5,519
7	Temporary Sewer Bypass	LS	1	$ 1,345	$ 1,345
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	269	$ 80	$ 21,520
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	6	$ 750	$ 4,500
20	Import Trench Backfill	TN	464	$ 20	$ 9,278
21	Crushed Surfacing, Base Course	TN	108	$ 25	$ 2,711
22	Crushed Surfacing, Top Course	TN	54	$ 25	$ 1,356
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	109	$ 140	$ 15,259
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,059	$ 2,059
32	Cleanup and Testing	LS	1	$ 1,373	$ 1,373

Subtotal	$	79,272
30% Contingency	$	23,782
Subtotal	$	103,054
9.0% State Sales Tax	$	9,275
Estimated Total Construction Costs	**$**	**112,329**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	13,479
Construction Services	$	7,863
City Project Administration	$	2,247
Legal	$	1,123
Subtotal Project Allied Costs	**$**	**24,712**

Total Estimated Project Costs	**$**	**137,041**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # LL Puget and Sound View - easement

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,262	$ 2,262
2	Traffic Control Labor and Equipment	LS	1		$ -
3	Dewatering	LS	1	$ 1,750	$ 1,750
4	Sheeting, Shoring and Bracing	LS	1	$ 1,750	$ 1,750
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 1,750	$ 1,750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	336	$ 27	$ 9,072
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	7	$ 750	$ 5,250
20	Import Trench Backfill	TN	99	$ 20	$ 1,974
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 646	$ 646
32	Cleanup and Testing	LS	1	$ 431	$ 431

Subtotal	$	24,886
30% Contingency	$	7,466
Subtotal	$	32,351
9.0% State Sales Tax	$	2,912
Estimated Total Construction Costs	**$**	**35,263**
PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	4,232
Construction Services	$	2,468
City Project Administration	$	705
Legal	$	353
Subtotal Project Allied Costs	**$**	**7,758**
Total Estimated Project Costs	**$**	**43,021**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # MM SR 99 and 224th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 6,036	$ 6,036
2	Traffic Control Labor and Equipment	LS	1	$ 20,000	$ 20,000
3	Dewatering	LS	1	$ 650	$ 650
4	Sheeting, Shoring and Bracing	LS	1	$ 2,500	$ 2,500
5	Sawcutting Pavement	LF	260	$ 4	$ 1,040
6	Pavement Removal	SY	101	$ 20	$ 2,023
7	Temporary Sewer Bypass	LS	1	$ 2,000	$ 2,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	15-inch Sanitary Sewer	LF	130	$ 130	$ 16,900
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA		$ 750	$ -
20	Import Trench Backfill	TN	183	$ 20	$ 3,666
21	Crushed Surfacing, Base Course	TN	43	$ 25	$ 1,073
22	Crushed Surfacing, Top Course	TN	21	$ 25	$ 536
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	51	$ 140	$ 7,098
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,725	$ 1,725
32	Cleanup and Testing	LS	1	$ 1,150	$ 1,150

Subtotal	$	66,396
30% Contingency	$	19,919
Subtotal	$	86,315
9.0% State Sales Tax	$	7,768
Estimated Total Construction Costs	**$**	**94,083**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	11,290
Construction Services	$	6,586
City Project Administration	$	1,882
Legal	$	941
Subtotal Project Allied Costs	**$**	**20,698**

Total Estimated Project Costs	**$**	**114,781**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # NN Dayton and 3rd

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 17,404	$ 17,404
2	Traffic Control Labor and Equipment	LS	1	$ 10,000	$ 10,000
3	Dewatering	LS	1	$ 3,000	$ 3,000
4	Sheeting, Shoring and Bracing	LS	1	$ 3,000	$ 3,000
5	Sawcutting Pavement	LF	1146	$ 4	$ 4,584
6	Pavement Removal	SY	397	$ 20	$ 7,937
7	Temporary Sewer Bypass	LS	1	$ 3,000	$ 3,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 18-inch	LF	159	$ 60	$ 9,540
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	18-inch Sanitary Sewer	LF	353	$ 180	$ 63,540
17	48-inch Dia Manhole, 0' to 8' deep	EA	3	$ 4,000	$ 12,000
18	48-inch Dia Manhole, extra depth	VF	6	$ 300	$ 1,800
19	Lateral Connection, 6-inch PVC	EA	11	$ 750	$ 8,250
20	Import Trench Backfill	TN	653	$ 20	$ 13,057
21	Crushed Surfacing, Base Course	TN	153	$ 25	$ 3,814
22	Crushed Surfacing, Top Course	TN	76	$ 25	$ 1,907
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	145	$ 140	$ 20,321
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 4,972	$ 4,972
32	Cleanup and Testing	LS	1	$ 3,315	$ 3,315

Subtotal	$	191,441
30% Contingency	$	57,432
Subtotal	$	248,873
9.0% State Sales Tax	$	22,399
Estimated Total Construction Costs	**$**	**271,272**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	32,553
Construction Services	$	18,989
City Project Administration	$	5,425
Legal	$	2,713
Subtotal Project Allied Costs	**$**	**59,680**

Total Estimated Project Costs	**$**	**330,952**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # OO 83rd and 204th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,007	$ 2,007
2	Traffic Control Labor and Equipment	LS		$ 2,500	$ -
3	Dewatering	LS	1	$ 640	$ 640
4	Sheeting, Shoring and Bracing	LS	1	$ 640	$ 640
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 640	$ 640
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF	128	$ 90	$ 11,520
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	2	$ 750	$ 1,500
20	Import Trench Backfill	TN	209	$ 20	$ 4,174
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 573	$ 573
32	Cleanup and Testing	LS	1	$ 382	$ 382

Subtotal	$	22,076
30% Contingency	$	6,623
Subtotal	$	28,699
9.0% State Sales Tax	$	2,583
Estimated Total Construction Costs	**$**	**31,282**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	3,754
Construction Services	$	2,190
City Project Administration	$	626
Legal	$	313
Subtotal Project Allied Costs	**$**	**6,882**

Total Estimated Project Costs	**$**	**38,164**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # PP Sound View and Water

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 5,745	$ 5,745
2	Traffic Control Labor and Equipment	LS	1	$ 1,500	$ 1,500
3	Dewatering	LS	1	$ 1,500	$ 1,500
4	Sheeting, Shoring and Bracing	LS	1	$ 1,500	$ 1,500
5	Sawcutting Pavement	LF	240	$ 4	$ 960
6	Pavement Removal	SY	67	$ 20	$ 1,333
7	Temporary Sewer Bypass	LS	1	$ 1,500	$ 1,500
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF	295	$ 130	$ 38,350
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	6	$ 750	$ 4,500
20	Import Trench Backfill	TN	85	$ 20	$ 1,692
21	Crushed Surfacing, Base Course	TN	20	$ 25	$ 492
22	Crushed Surfacing, Top Course	TN	10	$ 25	$ 246
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	8	$ 140	$ 1,142
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 1,641	$ 1,641
32	Cleanup and Testing	LS	1	$ 1,094	$ 1,094

Subtotal	$	63,197
30% Contingency	$	18,959
Subtotal	$	82,155
9.0% State Sales Tax	$	7,394
Estimated Total Construction Costs	**$**	**89,549**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	10,746
Construction Services	$	6,268
City Project Administration	$	1,791
Legal	$	895
Subtotal Project Allied Costs	**$**	**19,701**

Total Estimated Project Costs	**$**	**109,250**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # QQ 83rd and 202nd - easement

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,833	$ 2,833
2	Traffic Control Labor and Equipment	LS		$ 2,500	$ -
3	Dewatering	LS	1	$ 870	$ 870
4	Sheeting, Shoring and Bracing	LS	1	$ 870	$ 870
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 870	$ 870
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF	174	$ 100	$ 17,400
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	2	$ 750	$ 1,500
20	Import Trench Backfill	TN	274	$ 20	$ 5,471
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 809	$ 809
32	Cleanup and Testing	LS	1	$ 540	$ 540

Subtotal	$	31,163
30% Contingency	$	9,349
Subtotal	$	40,512
9.0% State Sales Tax	$	3,646
Estimated Total Construction Costs	**$**	**44,158**
PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	5,299
Construction Services	$	3,091
City Project Administration	$	883
Legal	$	442
Subtotal Project Allied Costs	**$**	**9,715**
Total Estimated Project Costs	**$**	**53,872**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # RR Maple and 10th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 11,705	$ 11,705
2	Traffic Control Labor and Equipment	LS	1	$ 1,660	$ 1,660
3	Dewatering	LS	1	$ 1,660	$ 1,660
4	Sheeting, Shoring and Bracing	LS	1	$ 1,660	$ 1,660
5	Sawcutting Pavement	LF	984	$ 4	$ 3,936
6	Pavement Removal	SY	347	$ 20	$ 6,944
7	Temporary Sewer Bypass	LS	1	$ 1,660	$ 1,660
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	15-inch Sanitary Sewer	LF	332	$ 130	$ 43,160
17	48-inch Dia Manhole, 0' to 8' deep	EA	2	$ 4,000	$ 8,000
18	48-inch Dia Manhole, extra depth	VF	4	$ 300	$ 1,200
19	Lateral Connection, 6-inch PVC	EA	8	$ 750	$ 6,000
20	Import Trench Backfill	TN	581	$ 20	$ 11,618
21	Crushed Surfacing, Base Course	TN	136	$ 25	$ 3,395
22	Crushed Surfacing, Top Course	TN	68	$ 25	$ 1,698
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	135	$ 140	$ 18,889
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 3,344	$ 3,344
32	Cleanup and Testing	LS	1	$ 2,230	$ 2,230

Subtotal	$ 128,758
30% Contingency	$ 38,628
Subtotal	$ 167,386
9.0% State Sales Tax	$ 15,065
Estimated Total Construction Costs	**$ 182,451**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 21,894
Construction Services	$ 12,772
City Project Administration	$ 3,649
Legal	$ 1,825
Subtotal Project Allied Costs	**$ 40,139**

Total Estimated Project Costs	**$ 222,590**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # SS Walnut and 96th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 10,011	$ 10,011
2	Traffic Control Labor and Equipment	LS	1	$ 1,655	$ 1,655
3	Dewatering	LS	1	$ 1,655	$ 1,655
4	Sheeting, Shoring and Bracing	LS	1	$ 1,655	$ 1,655
5	Sawcutting Pavement	LF	1062	$ 4	$ 4,248
6	Pavement Removal	SY	369	$ 20	$ 7,372
7	Temporary Sewer Bypass	LS	1	$ 1,655	$ 1,655
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF	331	$ 100	$ 33,100
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	10	$ 750	$ 7,500
20	Import Trench Backfill	TN	608	$ 20	$ 12,154
21	Crushed Surfacing, Base Course	TN	142	$ 25	$ 3,551
22	Crushed Surfacing, Top Course	TN	71	$ 25	$ 1,775
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	136	$ 140	$ 19,025
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 2,860	$ 2,860
32	Cleanup and Testing	LS	1	$ 1,907	$ 1,907

Subtotal	$ 110,124
30% Contingency	$ 33,037
Subtotal	$ 143,161
9.0% State Sales Tax	$ 12,884
Estimated Total Construction Costs	**$ 156,045**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 18,725
Construction Services	$ 10,923
City Project Administration	$ 3,121
Legal	$ 1,560
Subtotal Project Allied Costs	**$ 34,330**

Total Estimated Project Costs	**$ 190,375**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # TT Pine and SR 104

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 19,037	$ 19,037
2	Traffic Control Labor and Equipment	LS		$ 2,500	$ -
3	Dewatering	LS	1	$ 35,000	$ 35,000
4	Sheeting, Shoring and Bracing	LS	1	$ 15,000	$ 15,000
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 15,000	$ 15,000
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	42-inch Sanitary Sewer	LF	526	$ 200	$ 105,200
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	3	$ 750	$ 2,250
20	Import Trench Backfill	TN	443	$ 20	$ 8,851
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 5,439	$ 5,439
32	Cleanup and Testing	LS	1	$ 3,626	$ 3,626

Subtotal	$ 209,403
30% Contingency	$ 62,821
Subtotal	$ 272,224
9.0% State Sales Tax	$ 24,500
Estimated Total Construction Costs	**$ 296,724**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 35,607
Construction Services	$ 20,771
City Project Administration	$ 5,934
Legal	$ 2,967
Subtotal Project Allied Costs	**$ 65,279**

Total Estimated Project Costs	**$ 362,003**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # UU 75th and 165th

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,952	$ 2,952
2	Traffic Control Labor and Equipment	LS	1	$ 580	$ 580
3	Dewatering	LS	1	$ 580	$ 580
4	Sheeting, Shoring and Bracing	LS	1	$ 580	$ 580
5	Sawcutting Pavement	LF	232	$ 4	$ 928
6	Pavement Removal	SY	112	$ 20	$ 2,249
7	Temporary Sewer Bypass	LS	1	$ 580	$ 580
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF	116	$ 80	$ 9,280
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	2	$ 750	$ 1,500
20	Import Trench Backfill	TN	192	$ 20	$ 3,835
21	Crushed Surfacing, Base Course	TN	44	$ 25	$ 1,096
22	Crushed Surfacing, Top Course	TN	22	$ 25	$ 548
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	45	$ 140	$ 6,360
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 844	$ 844
32	Cleanup and Testing	LS	1	$ 562	$ 562

Subtotal	$	32,476
30% Contingency	$	9,743
Subtotal	$	42,218
9.0% State Sales Tax	$	3,800
Estimated Total Construction Costs	**$**	**46,018**
PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	5,522
Construction Services	$	3,221
City Project Administration	$	920
Legal	$	460
Subtotal Project Allied Costs	**$**	**10,124**
Total Estimated Project Costs	**$**	**56,142**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # VV 7th and Bell

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 1,100	$ 1,100
2	Traffic Control Labor and Equipment	LS	1	$ 500	$ 500
3	Dewatering	LS	1	$ 500	$ 500
4	Sheeting, Shoring and Bracing	LS	1	$ 500	$ 500
5	Sawcutting Pavement	LF	80	$ 4	$ 320
6	Pavement Removal	SY	22	$ 20	$ 444
7	Temporary Sewer Bypass	LS	1	$ 500	$ 500
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF	186	$ 27	$ 5,022
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	2	$ 750	$ 1,500
20	Import Trench Backfill	TN	28	$ 20	$ 564
21	Crushed Surfacing, Base Course	TN	7	$ 25	$ 164
22	Crushed Surfacing, Top Course	TN	3	$ 25	$ 82
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	3	$ 140	$ 381
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 314	$ 314
32	Cleanup and Testing	LS	1	$ 210	$ 210

Subtotal	$	12,101
30% Contingency	$	3,630
Subtotal	$	15,732
9.0% State Sales Tax	$	1,416
Estimated Total Construction Costs	**$**	**17,147**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	2,058
Construction Services	$	1,200
City Project Administration	$	343
Legal	$	171
Subtotal Project Allied Costs	**$**	**3,772**

Total Estimated Project Costs	**$**	**20,920**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # WW 8th and Driftwood - easement

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 2,609	$ 2,609
2	Traffic Control Labor and Equipment	LS		$ 2,500	$ -
3	Dewatering	LS	1	$ 750	$ 750
4	Sheeting, Shoring and Bracing	LS	1	$ 750	$ 750
5	Sawcutting Pavement	LF		$ 4	$ -
6	Pavement Removal	SY		$ 20	$ -
7	Temporary Sewer Bypass	LS	1	$ 750	$ 750
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF	150	$ 130	$ 19,500
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	12-inch Sanitary Sewer	LF		$ 100	$ -
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	3	$ 750	$ 2,250
20	Import Trench Backfill	TN	42	$ 20	$ 846
21	Crushed Surfacing, Base Course	TN		$ 25	$ -
22	Crushed Surfacing, Top Course	TN	0	$ 25	$ -
23	HMA Trench Patch, CL 1/2, PG 58-22	TN		$ 140	$ -
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 745	$ 745
32	Cleanup and Testing	LS	1	$ 497	$ 497

Subtotal	$	28,697
30% Contingency	$	8,609
Subtotal	$	37,306
9.0% State Sales Tax	$	3,358
Estimated Total Construction Costs	**$**	**40,664**

PROJECT ALLIED COSTS		
Engineering Design, Survey, Geotechnical and Permits	$	4,880
Construction Services	$	2,846
City Project Administration	$	813
Legal	$	407
Subtotal Project Allied Costs	**$**	**8,946**

Total Estimated Project Costs	**$**	**49,610**

Comprehensive Sewer Plan 2013
Capital Improvement Projects
Cost Estimate CIP # XX 3rd and Walnut

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$ 22,511	$ 22,511
2	Traffic Control Labor and Equipment	LS	1	$ 10,000	$ 10,000
3	Dewatering	LS	1	$ 35,000	$ 35,000
4	Sheeting, Shoring and Bracing	LS	1	$ 5,000	$ 5,000
5	Sawcutting Pavement	LF	1282	$ 4	$ 5,128
6	Pavement Removal	SY	454	$ 20	$ 9,084
7	Temporary Sewer Bypass	LS	1	$ 7,500	$ 7,500
8	Pipe Bursting, Ex 8" to 12" Dia	LF		$ 130	$ -
9	Pipe Bursting, Ex 10" to 12" Dia	LF		$ 130	$ -
10	Pipe Bursting, Ex 12" to 15" Dia	LF		$ 150	$ -
11	CIPP - 8-inch	LF		$ 27	$ -
12	CIPP - 10-inch	LF		$ 31	$ -
13	CIPP - 12-inch	LF		$ 45	$ -
14	8-inch Sanitary Sewer	LF		$ 80	$ -
15	10-inch Sanitary Sewer	LF		$ 90	$ -
16	42-inch Sanitary Sewer	LF	441	$ 200	$ 88,200
17	48-inch Dia Manhole, 0' to 8' deep	EA		$ 4,000	$ -
18	48-inch Dia Manhole, extra depth	VF		$ 300	$ -
19	Lateral Connection, 6-inch PVC	EA	10	$ 750	$ 7,500
20	Import Trench Backfill	TN	763	$ 20	$ 15,256
21	Crushed Surfacing, Base Course	TN	178	$ 25	$ 4,458
22	Crushed Surfacing, Top Course	TN	89	$ 25	$ 2,229
23	HMA Trench Patch, CL 1/2, PG 58-22	TN	179	$ 140	$ 25,031
24	Pump Station - Mechanical	LS		$ 100,000	$ -
25	Pump Station - Electrical	LS		$ 53,000	$ -
26	Above Grade Structure	LS		$ 125,000	$ -
27	Emergency Generator	LS		$ 40,000	$ -
28	8-inch Force Main	LF		$ 45	$ -
29	96-inch Dia Manhole, 0' to 8' deep	EA		$ 15,000	$ -
30	96-inch Dia Manhole, extra depth	VF		$ 500	$ -
31	Restoration	LS	1	$ 6,432	$ 6,432
32	Cleanup and Testing	LS	1	$ 4,288	$ 4,288

Subtotal	$ 247,616
30% Contingency	$ 74,285
Subtotal	$ 321,901
9.0% State Sales Tax	$ 28,971
Estimated Total Construction Costs	**$ 350,872**

PROJECT ALLIED COSTS	
Engineering Design, Survey, Geotechnical and Permits	$ 42,105
Construction Services	$ 24,561
City Project Administration	$ 7,017
Legal	$ 3,509
Subtotal Project Allied Costs	**$ 77,192**

Total Estimated Project Costs	**$ 428,064**

APPENDIX F

Known Collection System Deficiencies

Table F.1 – Red Area Jetting

Table F.2 – Granite O&M Segments

Table F.3 – Granite Known Deficiencies – Trenchless

Table F.4 – Granite Known Deficiencies – Dig up and Replace

Table F.5 – Capacity

Table F.6 – Ranking – All Categories

Table F.7 – Ranking – Without Granite O&M

Table F.8 – Ranking – Granite Only

Table F.1 Red Area Jetting							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
Red Area Jetting							
RA-1	16131 75th Place West	Grease	1-36 to 1-36A	211	PVC	1	
RA-2	7117 176th St. SW	Dirt, Grease, Grit	3-93 to 3-94	150	Conc	3	
RA-3	7601 OVD Post Office	Grit	5-325 to 5-328	350	Conc	5	
RA-4	18209 76th Ave West	Grit	5-325 to 5-511-11	80	Conc	5	
RA-5	Dellwood Dr. at 78th Ave W	Black Water	5-191 to 5-187	200	Conc	5	
RA-6	8015 196th St SW		5-334A CO to main	60	PVC	5	
RA-7	Admiral Way	Grease	7-3 to 7-2	425	Conc	7	
RA-8	Admiral Way	Grease	7-4 to 7-3	380	Conc	7	
RA-9	Admiral Way	Grease	7-5 to 7-4	380	Conc	7	
RA-10	Admiral Way	Grease	7-6 to 7-5	280	Conc	7	
RA-11	Admiral Way at West Dayton	Grit	7-6 to CO	125	Conc	7	
RA-12	Admiral Way at Dayton	Grease	7-11 to 7-10	80	Conc	7	
RA-13	Admiral Way at Dayton	Grease	7-7 to 7-11	37	Conc	7	
RA-14	Admiral Way	Grease	7-7 to 7-6	35	Conc	7	
RA-15	7th at Edmonds St	None	8-99 to 8-98	102	Conc	8	
RA-16	7th Ave at Edmonds St	Black Water	8-99 to 8-101A	207	Conc	8	
RA-17	7th Ave at Sprague St	None	8-316 to 8-99	290	Conc	8	
RA-18	7th Ave N. at Daley	Grit, Black Water	8-135 to 8-316	300	Conc	8	
RA-19	Alder St at Yost Park	Grit (a lot)	8-328 to 8-2	265	Conc	8	
RA-20	1053 Alder Street	Grit (a lot)	8-32A to 8-32B	55	Conc	8	
RA-21	10th at Alder Street	Grit (a lot)	8-31 to 8-32	336	Conc	8	
RA-22	942 Alder Street	Grit (a lot)	8-30 to 8-31	275	Conc	8	
RA-23	1048 Walnut Street	Grit (a lot)	8-2A to 8-2	205	Conc	8	
RA-24	1033 Walnut Street	Grit	8-3 to 8-2A	130	Conc	8	
RA-25	10th Ave South at Walnut St	Grit (a lot)	8-4 to 8-3	335	Conc	8	
RA-26	935 Walnut Street	Grit (a lot)	8-5 to 8-4	260	Conc	8	
RA-27	Pine Ridge Park	Black Water	8-202 to 8-201	165	Conc	9	
RA-28	Pine Ridge Park	Black Water	9-20 to 9-202	430	Conc	9	
RA-29	Bpind Ridge Park	Black Water	9-202 to 9-224	503	Conc	9	
RA-30	8610 Main Street	Black Water	9-19 to 9-20	56	Conc	9	
RA-31	8610 Main Street	Grit	9-16 to 9-19	178	Conc	9	
RA-32	7703 203 Street SW	Grit	9-314 to 9-313	310	Conc	9	
RA-33	7726 202 Place	Grit, Black Water	9-366 to 9-314	350	Conc	9	
RA-34	7804 200th Street	Black Water	9-347 to 9-346	130	Conc	9	
RA-35	7907 200th Street (Drop MH)	Black Water	9-348 to 9-347	400	Conc	9	
RA-36	8705 Maplewood Lane	Grit, Black Water	9-137 to 9-138	340	Conc	9	
RA-37	8620 Maplewood Lane	Grit (a lot)	9-139 to 9-137	155	Conc	9	
RA-38	76th at 212th Street S.W.	Grease	9-254 to 9-255	305	Conc	9	
RA-39	21309 76th Ave W (Drop MH)	Grit, Black Water	14-40 to 9-254	330	Conc	9 and 14	
RA-40	7122 210th Street	Grease	10-23 to 10-25	283	Conc	10	
RA-41	1153 8th Ave S.	Grit, Black Water	12-189 to 12-190 c/o	120	Conc	12	
RA-42	1115 8th Ave S.	Grit, Black Water	12-191 to 12-189	285	Conc	12	
RA-43	736 Fir Street	Black Water	12-192 to 12-191	200	Conc	12	
RA-44	9223 216th Street	Black Water	12-156 to 13-96	380	Conc	12 and 13	
RA-45	9126 Bowdoin	N/A	C/O	C/O	PVC	13	
RA-46	72nd Ave W. at 215th St	Black Water	14-7A to 14-7B	255	Conc	14	
RA-47	72nd Ave West at 215th St	Grit, Black Water	14-7 to 14-7A	275	Conc	14	
RA-48	215th At 72nd	Black Water	14-6 to 14-7	260	Conc	14	
RA-49	21808 Highway 99	Black Water	14-22 to 14-24	360	Conc	14	
RA-50	74th at 228th St	Grease	14-65 to 14-66	320	Conc	14	
RA-51	240th At Highway 99	None	16-60 to 16-59	330	Conc	16	
RA-52	240th St and 78th Ave W	Grit, Black Water	16-77 to 16-65	275	Conc	16	
RA-53	240th at 78th Ave W	Black Water	16-76 to 16-77	160	Conc	16	
RA-54	76th Ave W. at 242nd St	Black Water	7-81 to 17-80	360	Conc	17	
RA-55	24122 76th Ave W	Black Water	17-82 to 17-81	105	Conc	17	
RA-56	23819 76th Ave W	Black Water	17-72 to Main	44	Conc	17	
RA-57	23821 76th Ave	Grease	17-73 to 17-69	232	Conc	17	
Miscellaneous Meter Maintenance							
MM-1	Edmonds Way Robinhood Lanes	Brush Sensor				15	
MM-2	244th and Hwy 99 - NW Corner	Clean Flume					
MM-3	Denny's on SR 104 and Hwy 99	Clean Flume				16	
MM-4	Old Ballinger Pump Station	Clean Flume				17	
MM-5	East Side, NE Corner of Ballinger PS	Clean Flume				17	
MM-6	Lake Ballinger Way and 205th St	Clean Flume					
MM-7	Ballinger Golf Course at 74th Ave	Clean Flume				17	
MM-8	SE Corner of Hwy 99 and 224th St	Clean Flume				14	
MM-9	22304 Hwy 99	Clean Flume				14	

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
GRANITE Non-CIP							
	Light Roots						
LR-1	Lift Station 1	Light Root Problem	4-170-4-171	0			
LR-2	Lift Station 1	Light Root Problem	4-186A-4-186	0			
LR-3	Lift Station 1	Light Root Problem	4-221-4-220	0			
LR-4	Lift Station 1	Light Root Problem	5-123-4-186A	0			
LR-5	Lift Station 3	Light Root Problem	4-69A-4-70	0			
LR-6	Lift Station 1	Light Root Problem	4-212-4-213	0			
LR-7	Lift Station 1	Light Root Problem	4-137-4-133	0			
LR-8	Lift Station 10	Light Root Problem	4-9-4-7	0			
LR-9	Lift Station 1	Light Root Problem	5-278-5-271	0			
LR-10	Lift Station 3	Light Root Problem	4-45-4-46	0			
LR-11	Lift Station 1	Light Root Problem	4-145-4-143	0			
LR-12	Lift Station 3	Light Root Problem	4-46-4-47	0			
LR-13	Lift Station 1	Light Root Problem	4-115-8-219H	0			
LR-14	Lift Station 1	Light Root Problem	5-74-5-72	0			
LR-15	Lift Station 1	Light Root Problem	5-278-5-271	0			
LR-16	Lift Station 3	Light Root Problem	4-52-4-52A	0			
LR-17	Lift Station 1	Light Root Problem	5-122-5-121	0			
LR-18	Lift Station 1	Light Root Problem	4-141-4-142	0			
LR-19	Lift Station 1	Light Root Problem	5-118C-5-118B	0			
LR-20	Lift Station 1	Light Root Problem	4-140-4-139	0			
LR-21	Lift Station 1	Light Root Problem	5-278-5-271	0			
LR-22	Edmonds WWTP	Light Root Problem	8-311-8-312	0			
LR-23	Edmonds WWTP	Light Root Problem	8-44-8-45	0			
LR-24	Edmonds WWTP	Light Root Problem	8-44-8-45	0			
LR-25	Lift Station 1	Light Root Problem	8-244-8-243	0			
LR-26	Lift Station 10	Light Root Problem	5-89-5-99	0			
LR-27	Lift Station 10	Light Root Problem	2-112-2-111	8			
LR-28	Lift Station 1	Light Root Problem	4-138-4-137	0			
LR-29	Edmonds WWTP	Light Root Problem	12-175-12-146	0			
LR-30	Lift Station 1	Light Root Problem	8-209-8-210	0			
LR-31	Lynnwood WWTP	Light Root Problem	3-121-3-120	0			
LR-32	Lift Station 1	Light Root Problem	4-138-4-137	0			
LR-33	Lift Station 4	Light Root Problem	2-31-2-32	0			
LR-34	Lift Station 4	Light Root Problem	2-31-2-32	0			
LR-35	Lynnwood WWTP	Light Root Problem	3-121-3-120	0			
LR-36	Lift Station 4	Light Root Problem	2-84-2-83	0			
LR-37	Lynnwood WWTP	Light Root Problem	3-133-3-134	0			
LR-38	Lynnwood WWTP	Light Root Problem	3-109H-3-109G	0			
LR-39	Lynnwood WWTP	Light Root Problem	3-109G-3-109F	0			
LR-40	Lift Station 10	Light Root Problem	2-113A-2-113	0			
LR-41	Lynnwood WWTP	Light Root Problem	3-63-3-64	0			
LR-42	Lynnwood WWTP	Light Root Problem	3-131-3-132	0			
LR-43	Lift Station 1	Light Root Problem	4-110-4-109	0			
LR-44	Lift Station 1	Light Root Problem	8-172K-8-172G	0			
LR-45	Lift Station 1	Light Root Problem	4-78-8-244	0			
LR-46	Edmonds WWTP	Light Root Problem	12-175-12-146	0			
LR-47	Lift Station 9	Light Root Problem	5-299-5-300	0			
LR-48	Edmonds WWTP	Light Root Problem	12-175-12-146	0			
LR-49	Lift Station 1	Light Root Problem	5-260-5-344	0			
LR-50	Lift Station 1	Light Root Problem	5-252A-5-252B	0			
LR-51	Lift Station 1	Light Root Problem	4-78-8-244	0			
LR-52	Lynnwood WWTP	Light Root Problem	5-75-5-74	0			
LR-53	Lift Station 1	Light Root Problem	5-246-5-245	0			
LR-54	Edmonds WWTP	Light Root Problem	12-175-12-146	0			
LR-55	Edmonds WWTP	Light Root Problem	12-175-12-146	0			
LR-56	Edmonds WWTP	Light Root Problem	8-311-8-312	0			
LR-57	Lift Station 1	Light Root Problem	4-110-4-109	0			
LR-58	Lift Station 1	Light Root Problem	4-109-4-108	0			
LR-59	Edmonds WWTP	Light Root Problem	12-175-12-146	0			
LR-60	Edmonds WWTP	Light Root Problem	12-175-12-146	0			
LR-61	Lift Station 1	Light Root Problem	8-95-8-96	0			
LR-62	Lift Station 1	Light Root Problem	4-110-4-109	0			
LR-63	Lift Station 1	Light Root Problem	5-260-5-344	0			
LR-64	Lift Station 9	Light Root Problem	5-330-5-329	0			
LR-65	Lift Station 1	Light Root Problem	5-267-5-261	0			
LR-66	Edmonds WWTP	Light Root Problem	8-78-8-77	0			
LR-67	Edmonds WWTP	Light Root Problem	8-72-8-73	0			
LR-68	Edmonds WWTP	Light Root Problem	8-78-8-77	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
LR-69	Lift Station 1	Light Root Problem	8-137-8-292A	0			
LR-70	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-71	Edmonds WWTP	Light Root Problem	8-331-8-330	0			
LR-72	Edmonds WWTP	Light Root Problem	7-44A-8-331	0			
LR-73	Edmonds WWTP	Light Root Problem	8-72-8-73	0			
LR-74	Lift Station 1	Light Root Problem	8-317-8-316	0			
LR-75	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-76	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-77	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-78	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-79	Lift Station 1	Light Root Problem	8-321-7-72	0			
LR-80	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-81	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-82	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-83	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-84	Edmonds WWTP	Light Root Problem	11-19-11-18	0			
LR-85	Edmonds WWTP	Light Root Problem	7-34-7-30	0			
LR-86	Lift Station 1	Light Root Problem	5-260-5-344	0			
LR-87	Edmonds WWTP	Light Root Problem	8-2A-8-3	0			
LR-88	Edmonds WWTP	Light Root Problem	8-331-8-330	0			
LR-89	Edmonds WWTP	Light Root Problem	8-39A-8-41	0			
LR-90	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-91	Lift Station 7	Light Root Problem	7-9-7-10	0			
LR-92	Edmonds WWTP	Light Root Problem	8-55-8-55A	0			
LR-93	Edmonds WWTP	Light Root Problem	8-21A-8-51	0			
LR-94	Edmonds WWTP	Light Root Problem	8-21A-8-51	0			
LR-95	Edmonds WWTP	Light Root Problem	8-51-8-50	0			
LR-96	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-97	Edmonds WWTP	Light Root Problem	7-35-7-33B	0			
LR-98	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-99	Edmonds WWTP	Light Root Problem	8-77-8-76	0			
LR-100	Edmonds WWTP	Light Root Problem	8-2A-8-3	0			
LR-101	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-102	Edmonds WWTP	Light Root Problem	8-13-8-21A	0			
LR-103	Edmonds WWTP	Light Root Problem	8-13-8-21A	0			
LR-104	Edmonds WWTP	Light Root Problem	8-332-8-331	0			
LR-105	Edmonds WWTP	Light Root Problem	8-72-8-73	0			
LR-106	Edmonds WWTP	Light Root Problem	7-9-7-10	0			
LR-107	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-108	Edmonds WWTP	Light Root Problem	8-2-8-2A	0			
LR-109	Edmonds WWTP	Light Root Problem	7-44A-8-331	0			
LR-110	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-111	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-112	Edmonds WWTP	Light Root Problem	8-21-8-21A	0			
LR-113	Lift Station 1	Light Root Problem	8-288-8-287	0			
LR-114	Edmonds WWTP	Light Root Problem	8-64B-8-64A	0			
LR-115	Edmonds WWTP	Light Root Problem	8-77-8-76	0			
LR-116	Edmonds WWTP	Light Root Problem	8-21A-8-51	0			
LR-117	Edmonds WWTP	Light Root Problem	8-69-8-70	0			
LR-118	Edmonds WWTP	Light Root Problem	8-64B-8-64A	0			
LR-119	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-120	Edmonds WWTP	Light Root Problem	8-51-8-50	0			
LR-121	Edmonds WWTP	Light Root Problem	8-72-8-73	0			
LR-122	Lift Station 1	Light Root Problem	8-101A-8-100	0			
LR-123	Lift Station 1	Light Root Problem	8-101A-8-100	0			
LR-124	Lift Station 1	Light Root Problem	8-101A-8-100	0			
LR-125	Lift Station 1	Light Root Problem	8-101A-8-100	0			
LR-126	Lift Station 7	Light Root Problem	7-9-7-10	0			
LR-127	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-128	Lift Station 1	Light Root Problem	8-101A-8-100	0			
LR-129	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-130	Lift Station 1	Light Root Problem	8-321-7-72	0			
LR-131	Edmonds WWTP	Light Root Problem	8-64B-8-64A	0			
LR-132	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-133	Edmonds WWTP	Light Root Problem	8-332-8-331	0			
LR-134	Edmonds WWTP	Light Root Problem	8-51-8-50	0			
LR-135	Lift Station 1	Light Root Problem	8-101B-8-101A	0			
LR-136	Lift Station 1	Light Root Problem	8-101B-8-101A	0			
LR-137	Lift Station 1	Light Root Problem	8-288-8-287	0			
LR-138	Lift Station 1	Light Root Problem	8-254-8-253	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
LR-139	Edmonds WWTP	Light Root Problem	8-39A-8-41	0			
LR-140	Edmonds WWTP	Light Root Problem	8-21A-8-51	0			
LR-141	Edmonds WWTP	Light Root Problem	8-51-8-50	0			
LR-142	Lift Station 1	Light Root Problem	8-317-8-316	0			
LR-143	Edmonds WWTP	Light Root Problem	8-39A-8-41	0			
LR-144	Edmonds WWTP	Light Root Problem	8-78-8-77	0			
LR-145	Edmonds WWTP	Light Root Problem	8-2-8-2A	0			
LR-146	Edmonds WWTP	Light Root Problem	7-44A-8-331	0			
LR-147	Edmonds WWTP	Light Root Problem	8-72-8-73	0			
LR-148	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-149	Edmonds WWTP	Light Root Problem	8-332-8-331	0			
LR-150	Edmonds WWTP	Light Root Problem	7-34-7-30	0			
LR-151	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-152	Lift Station 1	Light Root Problem	8-102-8-101	0			
LR-153	Edmonds WWTP	Light Root Problem	8-21-8-21A	0			
LR-154	Lift Station 1	Light Root Problem	8-321-7-72	0			
LR-155	Lift Station 1	Light Root Problem	8-162-8-161	0			
LR-156	Edmonds WWTP	Light Root Problem	12-16-12-17	0			
LR-157	Edmonds WWTP	Light Root Problem	8-87-8-86	0			
LR-158	Edmonds WWTP	Light Root Problem	8-87-8-86	0			
LR-159	Edmonds WWTP	Light Root Problem	8-87-8-86	0			
LR-160	Edmonds WWTP	Light Root Problem	8-86-8-112	0			
LR-161	Edmonds WWTP	Light Root Problem	8-86-8-112	0			
LR-162	Edmonds WWTP	Light Root Problem	8-86-8-112	0			
LR-163	Edmonds WWTP	Light Root Problem	8-112-8-117	0			
LR-164	Edmonds WWTP	Light Root Problem	9-264-9-266	0			
LR-165	Edmonds WWTP	Light Root Problem	8-87-8-86	0			
LR-166	Edmonds WWTP	Light Root Problem	8-54-8-56	0			
LR-167	Edmonds WWTP	Light Root Problem	7-66-8-327	0			
LR-168	Edmonds WWTP	Light Root Problem	8-112-8-117	0			
LR-169	Edmonds WWTP	Light Root Problem	8-87-8-86	0			
LR-170	Lift Station 1	Light Root Problem	8-249-8-265	0			
LR-171	Lift Station 1	Light Root Problem	8-291-8-283	0			
LR-172	Lift Station 1	Light Root Problem	8-291A-8-291	0			
LR-173	Edmonds WWTP	Light Root Problem	8-59A-8-59	0			
LR-174	Edmonds WWTP	Light Root Problem	7-66-8-327	0			
LR-175	Metro	Light Root Problem	9-262B-9-262A	0			
LR-176	Edmonds WWTP	Light Root Problem	12-16-12-17	0			
LR-177	Lift Station 1	Light Root Problem	8-167-8-165	0			
LR-178	Edmonds WWTP	Light Root Problem	8-112-8-117	0			
LR-179	Lift Station 1	Light Root Problem	9-109-8-193	3			
LR-180	Edmonds WWTP	Light Root Problem	7-66-8-327	0			
LR-181	Edmonds WWTP	Light Root Problem	12-16-12-17	3			
LR-182	Lift Station 1	Light Root Problem	8-291-8-283	0			
LR-183	Lift Station 1	Light Root Problem	8-291A-8-291	0			
LR-184	Lift Station 1	Light Root Problem	8-177-8-176	0			
LR-185	Edmonds WWTP	Light Root Problem	8-59A-8-59	0			
LR-186	Edmonds WWTP	Light Root Problem	12-16-12-17	0			
LR-187	Edmonds WWTP	Light Root Problem	8-54-8-56	0			
LR-188	Edmonds WWTP	Light Root Problem	8-59A-8-59	0			
LR-189	Edmonds WWTP	Light Root Problem	8-87-8-86	0			
LR-190	Edmonds WWTP	Light Root Problem	12-16-12-17	0			
LR-191	Edmonds WWTP	Light Root Problem	8-87-8-86	0			
LR-192	Edmonds WWTP	Light Root Problem	8-112-8-117	0			
LR-193	Lift Station 1	Light Root Problem	8-321-7-72	0			
LR-194	Edmonds WWTP	Light Root Problem	8-54-8-56	0			
LR-195	Lift Station 1	Light Root Problem	8-281-8-282	0			
LR-196	Edmonds WWTP	Light Root Problem	12-165-12-164	0			
LR-197	Edmonds WWTP	Light Root Problem	12-243-12-241	0			
LR-198	Edmonds WWTP	Light Root Problem	12-243-12-241	0			
LR-199	Edmonds WWTP	Light Root Problem	8-123-8-120	0			
LR-200	Lift Station 1	Light Root Problem	8-291-8-283	0			
LR-201	Lift Station 1	Light Root Problem	8-239-8-238	0			
LR-202	Edmonds WWTP	Light Root Problem	8-123-8-120	0			
LR-203	Edmonds WWTP	Light Root Problem	8-59A-8-59	0			
LR-204	Lift Station 1	Light Root Problem	5-344-5-345	0			
LR-205	Edmonds WWTP	Light Root Problem	8-112-8-117	0			
LR-206	Lynnwood WWTP	Light Root Problem	5-195-5-195A	0			
LR-207	Lynnwood WWTP	Light Root Problem	5-195-5-195A	0			
LR-208	Edmonds WWTP	Light Root Problem	8-123-8-120	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
LR-209	Lift Station 1	Light Root Problem	8-291-8-283	0			
LR-210	Lynnwood WWTP	Light Root Problem	5-194-5-195	0			
LR-211	Edmonds WWTP	Light Root Problem	7-66-8-327	0			
LR-212	Edmonds WWTP	Light Root Problem	8-123-8-120	0			
LR-213	Edmonds WWTP	Light Root Problem	8-54-8-56	0			
LR-214	Lift Station 1	Light Root Problem	8-291-8-283	0			
LR-215	Edmonds WWTP	Light Root Problem	8-59A-8-59	0			
LR-216	Lift Station 1	Light Root Problem	8-219A-8-219C	0			
LR-217	Lift Station 1	Light Root Problem	8-152-8-150	0			
LR-218	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-219	Edmonds WWTP	Light Root Problem	12-87-12-86	0			
LR-220	Edmonds WWTP	Light Root Problem	7-60-7-56	0			
LR-221	Lift Station 1	Light Root Problem	8-188A-8-188C	0			
LR-222	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-223	Edmonds WWTP	Light Root Problem	12-284F-12-284	0			
LR-224	Edmonds WWTP	Light Root Problem	12-101-12-95	0			
LR-225	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-226	Lift Station 1	Light Root Problem	8-184-8-186	0			
LR-227	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-228	Edmonds WWTP	Light Root Problem	8-332-8-331	0			
LR-229	Edmonds WWTP	Light Root Problem	7-46-7-47	0			
LR-230	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-231	Edmonds WWTP	Light Root Problem	12-78-12-77	0			
LR-232	Edmonds WWTP	Light Root Problem	8-30-8-29	0			
LR-233	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-234	Edmonds WWTP	Light Root Problem	7-60-7-56	0			
LR-235	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-236	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-237	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-238	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-239	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-240	Edmonds WWTP	Light Root Problem	12-151-12-22	0			
LR-241	Edmonds WWTP	Light Root Problem	7-34-7-30	0			
LR-242	Edmonds WWTP	Light Root Problem	7-38-7-36	0			
LR-243	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-244	Edmonds WWTP	Light Root Problem	8-18-8-55	0			
LR-245	Edmonds WWTP	Light Root Problem	7-86-7-87A	0			
LR-246	Edmonds WWTP	Light Root Problem	8-18-8-55	0			
LR-247	Edmonds WWTP	Light Root Problem	7-83-7-84	0			
LR-248	Edmonds WWTP	Light Root Problem	7-34-7-30	0			
LR-249	Edmonds WWTP	Light Root Problem	7-35-7-33B	0			
LR-250	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-251	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-252	Edmonds WWTP	Light Root Problem	7-82-7-83	0			
LR-253	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-254	Edmonds WWTP	Light Root Problem	7-60-7-56	0			
LR-255	Edmonds WWTP	Light Root Problem	7-46A-7-46	0			
LR-256	Edmonds WWTP	Light Root Problem	7-46-7-47	0			
LR-257	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-258	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-259	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-260	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-261	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-262	Edmonds WWTP	Light Root Problem	7-60-7-56	0			
LR-263	Edmonds WWTP	Light Root Problem	12-234B-12-234A	0			
LR-264	Edmonds WWTP	Light Root Problem	7-83-7-84	0			
LR-265	Edmonds WWTP	Light Root Problem	12-74-12-73	0			
LR-266	Edmonds WWTP	Light Root Problem	12-72-12-71	0			
LR-267	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-268	Edmonds WWTP	Light Root Problem	7-34-7-30	0			
LR-269	Edmonds WWTP	Light Root Problem	7-38-7-36	0			
LR-270	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-271	Edmonds WWTP	Light Root Problem	7-46-7-47	0			
LR-272	Edmonds WWTP	Light Root Problem	7-86-7-87A	0			
LR-273	Edmonds WWTP	Light Root Problem	12-95-12-94	0			
LR-274	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-275	Edmonds WWTP	Light Root Problem	7-83-7-84	0			
LR-276	Edmonds WWTP	Light Root Problem	12-89-12-88	0			
LR-277	Edmonds WWTP	Light Root Problem	7-46-7-47	0			
LR-278	Lift Station 1	Light Root Problem	8-136-8-137	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
LR-279	Edmonds WWTP	Light Root Problem	12-71-12-89	0			
LR-280	Edmonds WWTP	Light Root Problem	7-85-7-86	0			
LR-281	Edmonds WWTP	Light Root Problem	8-30-8-29	0			
LR-282	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-283	Edmonds WWTP	Light Root Problem	12-95-12-94	0			
LR-284	Edmonds WWTP	Light Root Problem	7-46A-7-46	0			
LR-285	Edmonds WWTP	Light Root Problem	7-62-7-61	0			
LR-286	Edmonds WWTP	Light Root Problem	12-12-12-13	0			
LR-287	Edmonds WWTP	Light Root Problem	12-87-12-86	0			
LR-288	Edmonds WWTP	Light Root Problem	7-83-7-84	0			
LR-289	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-290	Edmonds WWTP	Light Root Problem	7-35-7-33B	0			
LR-291	Edmonds WWTP	Light Root Problem	7-46-7-47	0			
LR-292	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-293	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-294	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-295	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-296	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-297	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-298	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-299	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-300	Edmonds WWTP	Light Root Problem	7-46A-7-46	0			
LR-301	Edmonds WWTP	Light Root Problem	7-66-8-327	0			
LR-302	Edmonds WWTP	Light Root Problem	8-30-8-29	0			
LR-303	Edmonds WWTP	Light Root Problem	12-95-12-94	0			
LR-304	Edmonds WWTP	Light Root Problem	12-95-12-94	0			
LR-305	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-306	Edmonds WWTP	Light Root Problem	12-87-12-86	0			
LR-307	Edmonds WWTP	Light Root Problem	7-83-7-84	0			
LR-308	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-309	Edmonds WWTP	Light Root Problem	12-72-12-71	0			
LR-310	Metro	Light Root Problem	9-262A-9-262	0			
LR-311	Edmonds WWTP	Light Root Problem	7-46-7-47	0			
LR-312	Edmonds WWTP	Light Root Problem	12-22-12-20	0			
LR-313	Edmonds WWTP	Light Root Problem	8-30-8-29	0			
LR-314	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-315	Edmonds WWTP	Light Root Problem	7-60-7-56	0			
LR-316	Edmonds WWTP	Light Root Problem	12-95-12-94	0			
LR-317	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-318	Edmonds WWTP	Light Root Problem	7-63-7-62	0			
LR-319	Lift Station 1	Light Root Problem	8-136-8-137	0			
LR-320	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-321	Edmonds WWTP	Light Root Problem	8-17-8-18	0			
LR-322	Edmonds WWTP	Light Root Problem	7-81-7-82	0			
LR-323	Edmonds WWTP	Light Root Problem	8-18-8-55	0			
LR-324	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-325	Edmonds WWTP	Light Root Problem	12-2-12-1	0			
LR-326	Edmonds WWTP	Light Root Problem	12-70-12-69	0			
LR-327	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-328	Edmonds WWTP	Light Root Problem	8-43-8-44	0			
LR-329	Edmonds WWTP	Light Root Problem	12-185G-12-185F	0			
LR-330	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-331	Edmonds WWTP	Light Root Problem	12-185G-12-185F	0			
LR-332	Edmonds WWTP	Light Root Problem	12-2-12-1	0			
LR-333	Edmonds WWTP	Light Root Problem	12-208-12-207	0			
LR-334	Edmonds WWTP	Light Root Problem	8-43-8-44	0			
LR-335	Edmonds WWTP	Light Root Problem	12-180A-12-180	0			
LR-336	Edmonds WWTP	Light Root Problem	12-18-12-19	0			
LR-337	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-338	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-339	Edmonds WWTP	Light Root Problem	12-226-12-225	0			
LR-340	Edmonds WWTP	Light Root Problem	8-43-8-44	0			
LR-341	Edmonds WWTP	Light Root Problem	12-182A-12-215	0			
LR-342	Edmonds WWTP	Light Root Problem	12-182A-12-215	0			
LR-343	Edmonds WWTP	Light Root Problem	12-208-12-207	0			
LR-344	Lift Station 1	Light Root Problem	8-316-8-135	0			
LR-345	Metro	Light Root Problem	13-157-13-156	0			
LR-346	Edmonds WWTP	Light Root Problem	12-2-12-1	0			
LR-347	Edmonds WWTP	Light Root Problem	12-208-12-207	0			
LR-348	Edmonds WWTP	Light Root Problem	8-73-8-74	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
LR-349	Edmonds WWTP	Light Root Problem	11-23A-11-21	0			
LR-350	Edmonds WWTP	Light Root Problem	12-287-12-286	0			
LR-351	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-352	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-353	Edmonds WWTP	Light Root Problem	12-246-12-243	0			
LR-354	Lift Station 1	Light Root Problem	8-316-8-135	0			
LR-355	Edmonds WWTP	Light Root Problem	12-208-12-207	0			
LR-356	Edmonds WWTP	Light Root Problem	12-208-12-207	0			
LR-357	Metro	Light Root Problem	13-157-13-156	0			
LR-358	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-359	Edmonds WWTP	Light Root Problem	7-46-7-47	0			
LR-360	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-361	Edmonds WWTP	Light Root Problem	12-84A-12-83	0			
LR-362	Edmonds WWTP	Light Root Problem	8-43-8-44	0			
LR-363	Edmonds WWTP	Light Root Problem	12-2-12-1	0			
LR-364	Metro	Light Root Problem	13-157-13-156	0			
LR-365	Edmonds WWTP	Light Root Problem	12-246-12-243	0			
LR-366	Edmonds WWTP	Light Root Problem	8-43-8-44	0			
LR-367	Edmonds WWTP	Light Root Problem	8-73-8-74	0			
LR-368	Edmonds WWTP	Light Root Problem	12-208-12-207	0			
LR-369	Edmonds WWTP	Light Root Problem	12-2-12-1	0			
LR-370	Edmonds WWTP	Light Root Problem	12-1-8-1	0			
LR-371	Edmonds WWTP	Light Root Problem	9-159-9-158	0			
LR-372	Edmonds WWTP	Light Root Problem	9-237-9-236	0			
LR-373	Lift Station 1	Light Root Problem	8-188B-8-188A	0			
LR-374	Edmonds WWTP	Light Root Problem	9-360-9-346	6			
LR-375	Lift Station 1	Light Root Problem	8-187A-8-187	0			
LR-376	Lift Station 1	Light Root Problem	8-289-8-288	0			
LR-377	Lift Station 2	Light Root Problem	8-294-8-295	0			
LR-378	Edmonds WWTP	Light Root Problem	9-299-9-298	0			
LR-379	Lift Station 1	Light Root Problem	8-289-8-288	0			
LR-380	Lift Station 1	Light Root Problem	9-134-9-136	0			
LR-381	Lift Station 9	Light Root Problem	5-334B-5-334A	0			
LR-382	Edmonds WWTP	Light Root Problem	9-299-9-298	0			
LR-383	Edmonds WWTP	Light Root Problem	15-1C-15-2	0			
LR-384	Edmonds WWTP	Light Root Problem	9-177-9-158A	0			
LR-385	Lift Station 9	Light Root Problem	5-334B-5-334A	0			
LR-386	Edmonds WWTP	Light Root Problem	9-363A-9-363	0			
LR-387	Lift Station 1	Light Root Problem	8-135-8-136	0			
LR-388	Edmonds WWTP	Light Root Problem	8-324-7-68	0			
LR-389	Edmonds WWTP	Light Root Problem	9-363A-9-363	0			
LR-390	Edmonds WWTP	Light Root Problem	8-324-7-68	0			
LR-391	Edmonds WWTP	Light Root Problem	9-11-9-10	0			
LR-392	Lift Station 1	Light Root Problem	8-193-8-192	4			
LR-393	Edmonds WWTP	Light Root Problem	11-21A-11-21	0			
LR-394	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-395	Edmonds WWTP	Light Root Problem	11-9A-7-35	0			
LR-396	Edmonds WWTP	Light Root Problem	9-225B-9-225	0			
LR-397	Edmonds WWTP	Light Root Problem	11-21A-11-21	0			
LR-398	Lift Station 1	Light Root Problem	9-84-9-83	0			
LR-399	Edmonds WWTP	Light Root Problem	11-12-11-11	0			
LR-400	Edmonds WWTP	Light Root Problem	9-225-9-224	0			
LR-401	Lift Station 1	Light Root Problem	9-84-9-83	0			
LR-402	Edmonds WWTP	Light Root Problem	11-9A-7-35	0			
LR-403	Edmonds WWTP	Light Root Problem	11-12-11-11	0			
LR-404	Edmonds WWTP	Light Root Problem	9-225-9-224	10			
LR-405	Metro	Light Root Problem	16-54-16-57	0			
LR-406	Edmonds WWTP	Light Root Problem	11-8-11-7	0			
LR-407	Lift Station 1	Light Root Problem	9-85-9-86	0			
LR-408	Edmonds WWTP	Light Root Problem	11-8-11-7	0			
LR-409	Lift Station 9	Light Root Problem	9-150-5-336	0			
LR-410	Edmonds WWTP	Light Root Problem	11-21A-11-21	0			
LR-411	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-412	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-413	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-414	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-415	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-416	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-417	Edmonds WWTP	Light Root Problem	11-23B-11-21	0			
LR-418	Edmonds WWTP	Light Root Problem	11-14-11-13	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
LR-419	Edmonds WWTP	Light Root Problem	11-9A-7-35	0			
LR-420	Edmonds WWTP	Light Root Problem	11-9A-7-35	0			
LR-421	Edmonds WWTP	Light Root Problem	9-363A-9-363	0			
LR-422	Edmonds WWTP	Light Root Problem	12-163-12-162	0			
LR-423	Edmonds WWTP	Light Root Problem	11-8-11-7	0			
LR-424	Edmonds WWTP	Light Root Problem	11-23B-11-21	0			
LR-425	Lift Station 1	Light Root Problem	8-178A-8-177A	0			
LR-426	Edmonds WWTP	Light Root Problem	12-19-12-28	0			
LR-427	Edmonds WWTP	Light Root Problem	11-6-11-5	0			
LR-428	Edmonds WWTP	Light Root Problem	11-5-11-3	0			
LR-429	Metro	Light Root Problem	17-15-17-16	0			
LR-430	Metro	Light Root Problem	13-133-13-134	0			
LR-431	Edmonds WWTP	Light Root Problem	13-67-13-66	0			
LR-432	Edmonds WWTP	Light Root Problem	12-19-12-28	0			
LR-433	Edmonds WWTP	Light Root Problem	12-19-12-28	0			
LR-434	Edmonds WWTP	Light Root Problem	11-5-11-3	0			
LR-435	Metro	Light Root Problem	16-46-16-47	0			
LR-436	Edmonds WWTP	Light Root Problem	13-67-13-66	0			
LR-437	Lift Station 1	Light Root Problem	8-195-8-196	4			
LR-438	Edmonds WWTP	Light Root Problem	12-135-12-134	0			
LR-439	Edmonds WWTP	Light Root Problem	11-5-11-3	0			
LR-440	Edmonds WWTP	Light Root Problem	12-135-12-134	0			
LR-441	Edmonds WWTP	Light Root Problem	12-108-12-109	0			
LR-442	Edmonds WWTP	Light Root Problem	8-85K-8-85F	0			
LR-443	Edmonds WWTP	Light Root Problem	12-19-12-28	0			
LR-444	Edmonds WWTP	Light Root Problem	11-5-11-3	0			
LR-445	Metro	Light Root Problem	17-15-17-16	0			
LR-446	Edmonds WWTP	Light Root Problem	13-67-13-66	0			
LR-447	Edmonds WWTP	Light Root Problem	13-89-9-11	0			
LR-448	Metro	Light Root Problem	13-21A-13-21	0			
LR-449	Metro	Light Root Problem	13-21A-13-21	0			
LR-450	Metro	Light Root Problem	13-8-13-8B	0			
LR-451	Metro	Light Root Problem	13-21A-13-21	0			
LR-452	Metro	Light Root Problem	13-21A-13-21	0			
LR-453	Metro	Light Root Problem	13-8A-13-8B	0			
LR-454	Lift Station 1	Light Root Problem	8-46-8-47	0			
LR-455	Edmonds WWTP	Light Root Problem	8-59A-8-59	0			
LR-456	Metro	Light Root Problem	16-32-16-33	0			
LR-457	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-458	Metro	Light Root Problem	13-21A-13-21	0			
LR-459	Edmonds WWTP	Light Root Problem	8-59A-8-59	0			
LR-460	Lift Station 1	Light Root Problem	8-289-8-288	0			
LR-461	Lift Station 1	Light Root Problem	8-46-8-47	0			
LR-462	Edmonds WWTP	Light Root Problem	8-60-8-59A	0			
LR-463	Metro	Light Root Problem	16-33-16-36	0			
LR-464	Metro	Light Root Problem	14-33-14-32	0			
LR-465	Metro	Light Root Problem	13-22A-13-22B	0			
LR-466	Lift Station 1	Light Root Problem	8-46-8-47	0			
LR-467	Lift Station 1	Light Root Problem	8-197-8-199	0			
LR-468	Edmonds WWTP	Light Root Problem	7-37-7-36	0			
LR-469	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-470	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-471	Metro	Light Root Problem	16-108-16-109	0			
LR-472	Metro	Light Root Problem	16-108-16-109	0			
LR-473	Metro	Light Root Problem	16-91-16-103	0			
LR-474	Lift Station 1	Light Root Problem	5-264-5-263	0			
LR-475	Edmonds WWTP	Light Root Problem	8-71-8-72	0			
LR-476	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-477	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-478	Lynnwood WWTP	Light Root Problem	5-13-5-12	0			
LR-479	Lift Station 1	Light Root Problem	8-323-8-321	0			
LR-480	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-481	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-482	Edmonds WWTP	Light Root Problem	8-71-8-72	0			
LR-483	Edmonds WWTP	Light Root Problem	8-41-8-42	0			
LR-484	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-485	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-486	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-487	Edmonds WWTP	Light Root Problem	11-8-11-7	0			
LR-488	Edmonds WWTP	Light Root Problem	7-78-7-79	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
LR-489	Metro	Light Root Problem	16-9-16-8	0			
LR-490	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-491	Metro	Light Root Problem	16-4-16-3	0			
LR-492	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-493	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-494	Edmonds WWTP	Light Root Problem	8-31-8-30	0			
LR-495	Edmonds WWTP	Light Root Problem	8-71-8-72	0			
LR-496	Lynnwood WWTP	Light Root Problem	5-218-5-210	0			
LR-497	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-498	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-499	Edmonds WWTP	Light Root Problem	11-12-11-11	0			
LR-500	Edmonds WWTP	Light Root Problem	12-217-12-216	0			
LR-501	Edmonds WWTP	Light Root Problem	8-31-8-30	0			
LR-502	Edmonds WWTP	Light Root Problem	8-5-8-6	0			
LR-503	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-504	Edmonds WWTP	Light Root Problem	12-28-8-2	0			
LR-505	Edmonds WWTP	Light Root Problem	12-74-12-73	0			
LR-506	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-507	Metro	Light Root Problem	14-7C-14-7A	0			
LR-508	Metro	Light Root Problem	INLET-13-167	0			
LR-509	Edmonds WWTP	Light Root Problem	8-71-8-72	0			
LR-510	Edmonds WWTP	Light Root Problem	8-71-8-72	0			
LR-511	Lift Station 1	Light Root Problem	8-291A-8-291	0			
LR-512	Lift Station 1	Light Root Problem	4-30-4-28	0			
LR-513	Edmonds WWTP	Light Root Problem	8-332-8-331	0			
LR-514	Edmonds WWTP	Light Root Problem	8-70-8-71	0			
LR-515	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-516	Edmonds WWTP	Light Root Problem	12-74-12-73	0			
LR-517	Edmonds WWTP	Light Root Problem	7-79-7-80	0			
LR-518	Edmonds WWTP	Light Root Problem	7-78-7-79	0			
LR-519	Metro	Light Root Problem	13-8A-13-8B	0			
LR-520	Metro	Light Root Problem	13-8A-13-8B	0			
LR-521	Lift Station 1	Light Root Problem	5-141A-5-141	0			
	Medium Roots						
MR-1	Lift Station 1	Medium Root Problem	4-133-4-132	0			
MR-2	Lift Station 1	Medium Root Problem	4-137-4-133	0			
MR-3	Lift Station 1	Medium Root Problem	4-210-4-213A	0			
MR-4	Lift Station 1	Medium Root Problem	4-143-4-150	0			
MR-5	Lift Station 1	Medium Root Problem	5-38-5-39	0			
MR-6	Lift Station 1	Medium Root Problem	4-78-8-244	0			
MR-7	Lift Station 1	Medium Root Problem	4-78-8-244	0			
MR-8	Lynnwood WWTP	Medium Root Problem	5-221-5-219A	0			
MR-9	Lift Station 10	Medium Root Problem	2-113-2-112	2			
MR-10	Lift Station 1	Medium Root Problem	8-244-8-243	0			
MR-11	Lynnwood WWTP	Medium Root Problem	5-149-5-150	0			
MR-12	Lynnwood WWTP	Medium Root Problem	5-217-5-216	0			
MR-13	Lynnwood WWTP	Medium Root Problem	5-148B-5-149	0			
MR-14	Lift Station 10	Medium Root Problem	2-113-2-112	4			
MR-15	Lift Station 1	Medium Root Problem	4-131-4-100	0			
MR-16	Lynnwood WWTP	Medium Root Problem	3-109G-3-109F	0			
MR-17	Lift Station 10	Medium Root Problem	2-109-2-108	0			
MR-18	Lynnwood WWTP	Medium Root Problem	5-150-5-151	0			
MR-19	Lift Station 1	Medium Root Problem	4-78-8-244	0			
MR-20	Lift Station 1	Medium Root Problem	4-110-4-109	0			
MR-21	Lynnwood WWTP	Medium Root Problem	5-150-5-151	0			
MR-22	Lift Station 9	Medium Root Problem	5-317-5-316	0			
MR-23	Lift Station 1	Medium Root Problem	5-79-5-70	0			
MR-24	Lynnwood WWTP	Medium Root Problem	3-120-3N-4	0			
MR-25	Lift Station 1	Medium Root Problem	4-78-8-244	0			
MR-26	Edmonds WWTP	Medium Root Problem	7-35-7-33B	0			
MR-27	Edmonds WWTP	Medium Root Problem	8-64B-8-64A	0			
MR-28	Edmonds WWTP	Medium Root Problem	8-41-8-42	0			
MR-29	Lift Station 1	Medium Root Problem	8-291A-8-291	0			
MR-30	Edmonds WWTP	Medium Root Problem	8-59A-8-59	0			
MR-31	Lift Station 1	Medium Root Problem	8-250-8-249	0			
MR-32	Edmonds WWTP	Medium Root Problem	12-160-12-149	0			
MR-33	Lift Station 1	Medium Root Problem	8-250-8-249	0			
MR-34	Metro	Medium Root Problem	9-262B-9-262A	0			
MR-35	Lift Station 1	Medium Root Problem	8-265-8-266	0			
MR-36	Metro	Medium Root Problem	9-262A-9-262	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
MR-37	Lift Station 1	Medium Root Problem	8-291-8-283	0			
MR-38	Metro	Medium Root Problem	9-262B-9-262A	3			
MR-39	Edmonds WWTP	Medium Root Problem	7-66-8-327	0			
MR-40	Lift Station 1	Medium Root Problem	8-172J-8-172F	0			
MR-41	Lift Station 9	Medium Root Problem	5-330E-5-330D	0			
MR-42	Edmonds WWTP	Medium Root Problem	7-66-8-327	0			
MR-43	Metro	Medium Root Problem	9-262A-9-262	0			
MR-44	Edmonds WWTP	Medium Root Problem	7-83-7-84	0			
MR-45	Edmonds WWTP	Medium Root Problem	7-37-7-36	0			
MR-46	Lift Station 1	Medium Root Problem	8-136-8-137	0			
MR-47	Edmonds WWTP	Medium Root Problem	12-78-12-77	0			
MR-48	Edmonds WWTP	Medium Root Problem	7-78-7-79	0			
MR-49	Edmonds WWTP	Medium Root Problem	7-78-7-79	0			
MR-50	Edmonds WWTP	Medium Root Problem	12-153-12-150	0			
MR-51	Edmonds WWTP	Medium Root Problem	7-49-7-49A	0			
MR-52	Edmonds WWTP	Medium Root Problem	7-78-7-79	0			
MR-53	Edmonds WWTP	Medium Root Problem	7-83-7-84	0			
MR-54	Edmonds WWTP	Medium Root Problem	7-46-7-47	0			
MR-55	Lift Station 1	Medium Root Problem	9-111-8-189D	0			
MR-56	Edmonds WWTP	Medium Root Problem	7-78-7-79	0			
MR-57	Edmonds WWTP	Medium Root Problem	7-38-7-36	0			
MR-58	Edmonds WWTP	Medium Root Problem	8-18-8-55	0			
MR-59	Edmonds WWTP	Medium Root Problem	7-83-7-84	0			
MR-60	Edmonds WWTP	Medium Root Problem	7-46-7-47	0			
MR-61	Edmonds WWTP	Medium Root Problem	12-250-12-249	0			
MR-62	Edmonds WWTP	Medium Root Problem	12-288-12-287	0			
MR-63	Edmonds WWTP	Medium Root Problem	8-73-8-74	0			
MR-64	Edmonds WWTP	Medium Root Problem	12-185G-12-185F	0			
MR-65	Edmonds WWTP	Medium Root Problem	13-112-13-114	0			
MR-66	Edmonds WWTP	Medium Root Problem	12-250-12-249	0			
MR-67	Edmonds WWTP	Medium Root Problem	12-182A-12-215	0			
MR-68	Edmonds WWTP	Medium Root Problem	12-246-12-243	27			
MR-69	Edmonds WWTP	Medium Root Problem	12-289-12-288A	0			
MR-70	Edmonds WWTP	Medium Root Problem	9-299-9-298	4			
MR-71	Lift Station 1	Medium Root Problem	8-188B-8-188A	0			
MR-72	Edmonds WWTP	Medium Root Problem	9-299-9-298	0			
MR-73	Edmonds WWTP	Medium Root Problem	9-222A-9-227	0			
MR-74	Metro	Medium Root Problem	17-44-17-46	0			
MR-75	Edmonds WWTP	Medium Root Problem	9-363A-9-363	0			
MR-76	Edmonds WWTP	Medium Root Problem	9-185-9-186	0			
MR-77	Edmonds WWTP	Medium Root Problem	9-273A-9-273	0			
MR-78	Edmonds WWTP	Medium Root Problem	7-78-7-79	0			
MR-79	Edmonds WWTP	Medium Root Problem	11-8-11-7	0			
MR-80	Edmonds WWTP	Medium Root Problem	11-14A-11-14	0			
MR-81	Edmonds WWTP	Medium Root Problem	11-14A-11-14	0			
MR-82	Lift Station 1	Medium Root Problem	8-195-8-196	0			
MR-83	Edmonds WWTP	Medium Root Problem	11-10-11-9B	0			
MR-84	Lift Station 1	Medium Root Problem	8-195-8-196	0			
MR-85	Edmonds WWTP	Medium Root Problem	7-78-7-79	0			
MR-86	Edmonds WWTP	Medium Root Problem	11-21A-11-21	0			
MR-87	Edmonds WWTP	Medium Root Problem	11-8-11-7	0			
MR-88	Edmonds WWTP	Medium Root Problem	12-33-12-31	0			
MR-89	Metro	Medium Root Problem	13-9A-13-166A	0			
MR-90	Lift Station 1	Medium Root Problem	8-196-8-196A	0			
MR-91	Lift Station 1	Medium Root Problem	8-203-8-202	0			
MR-92	Metro	Medium Root Problem	13-8D-13-8C	0			
MR-93	Metro	Medium Root Problem	13-21A-13-21	0			
MR-94	Metro	Medium Root Problem	13-21A-13-21	0			
MR-95	Metro	Medium Root Problem	13-21A-13-21	0			
MR-96	Metro	Medium Root Problem	13-21A-13-21	0			
MR-97	Metro	Medium Root Problem	13-21A-13-21	0			
MR-98	Metro	Medium Root Problem	13-21A-13-21	0			
MR-99	Edmonds WWTP	Medium Root Problem	13-65C-13-65D	0			
MR-100	Metro	Medium Root Problem	14-56-14-62	0			
MR-101	Metro	Medium Root Problem	13-21A-13-21	0			
MR-102	Edmonds WWTP	Medium Root Problem	8-59A-8-59	0			
MR-103	Edmonds WWTP	Medium Root Problem	8-59A-8-59	0			
MR-104	Metro	Medium Root Problem	13-22A-13-22B	0			
MR-105	Lift Station 1	Medium Root Problem	8-178I-8-178J	0			
MR-106	Edmonds WWTP	Medium Root Problem	8-60-8-59A	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
MR-107	Metro	Medium Root Problem	14-44-14-43	0			
MR-108	Lift Station 1	Medium Root Problem	8-178D-8-178C	0			
MR-109	Lift Station 1	Medium Root Problem	4-40-4-39	0			
MR-110	Edmonds WWTP	Medium Root Problem	7-83-7-84	0			
MR-111	Edmonds WWTP	Medium Root Problem	11-8-11-7	0			
MR-112	Edmonds WWTP	Medium Root Problem	7-37-7-36	0			
MR-113	Lift Station 3	Medium Root Problem	4-56-4-57	0			
MR-114	Lift Station 1	Medium Root Problem	8-188B-8-188A	0			
MR-115	Edmonds WWTP	Medium Root Problem	12-74-12-73	0			
MR-116	Lift Station 3	Medium Root Problem	4-60-4-62	7			
MR-117	Edmonds WWTP	Medium Root Problem	8-311-8-312	0			
MR-118	Edmonds WWTP	Medium Root Problem	11-8-11-7	0			
MR-119	Lift Station 10	Medium Root Problem	5-88A-5-88B	0			
	Roots - General						
R-1	Lift Station 12	Roots	1-36A-1-36	0			
R-2	Lift Station 1	Roots	5-52-5-51	0			
R-3	Lynnwood WWTP	Roots	5-324A-5N-3	0			
R-4	Lift Station 4	Roots	2-90-2-89	0			
R-5	Lynnwood WWTP	Roots	5-156-5-151	0			
R-6	Lynnwood WWTP	Roots	2-27-2-25	0			
R-7	Lynnwood WWTP	Roots	5-14-5-15	0			
R-8	Lift Station 1	Roots	5-246-5-245	0			
R-9	Edmonds WWTP	Roots	8-72-8-73	0			
R-10	Edmonds WWTP	Roots	8-73-8-74	0			
R-11	Lift Station 1	Roots	8-246-8-247	0			
R-12	Edmonds WWTP	Roots	9-270-9-308	0			
R-13	Edmonds WWTP	Roots	12-243-12-241	0			
R-14	Metro	Roots	9-262B-9-262A	0			
R-15	Lift Station 1	Roots	8-189B-8-189A	0			
R-16	Lift Station 10	Roots	5-88B-5-88C	0			
R-17	Edmonds WWTP	Roots	7-49-7-49A	0			
R-18	Edmonds WWTP	Roots	8-17-8-18	0			
R-19	Edmonds WWTP	Roots	7-49-7-49A	0			
R-20	Edmonds WWTP	Roots	7-49-7-49A	0			
R-21	Edmonds WWTP	Roots	12-95-12-94	0			
R-22	Edmonds WWTP	Roots	8-18-8-55	0			
R-23	Edmonds WWTP	Roots	12-87-12-86	4			
R-24	Edmonds WWTP	Roots	12-87-12-86	0			
R-25	Edmonds WWTP	Roots	7-79-7-80	0			
R-26	Edmonds WWTP	Roots	7-83-7-84	0			
R-27	Edmonds WWTP	Roots	12-89-12-88	0			
R-28	Edmonds WWTP	Roots	12-84-12-84A	42			
R-29	Edmonds WWTP	Roots	7-63-7-62	0			
R-30	Edmonds WWTP	Roots	8-17-8-18	0			
R-31	Edmonds WWTP	Roots	8-18-8-55	0			
R-32	Edmonds WWTP	Roots	12-101-12-95	10			
R-33	Metro	Roots	9-262A-9-262	0			
R-34	Metro	Roots	9-262A-9-262	0			
R-35	Metro	Roots	9-262A-9-262	0			
R-36	Edmonds WWTP	Roots	8-18-8-55	0			
R-37	Edmonds WWTP	Roots	12-246-12-243	0			
R-38	Edmonds WWTP	Roots	8-43-8-44	0			
R-39	Edmonds WWTP	Roots	12-84A-12-83	49			
R-40	Edmonds WWTP	Roots	8-43-8-44	0			
R-41	Edmonds WWTP	Roots	12-246-12-243	0			
R-42	Edmonds WWTP	Roots	9-276-9-277	0			
R-43	Edmonds WWTP	Roots	9-363A-9-363	0			
R-44	Edmonds WWTP	Roots	9-289-9-290	0			
R-45	Edmonds WWTP	Roots	9-363A-9-363	0			
R-46	Edmonds WWTP	Roots	9-273C-9-273B	0			
R-47	Lift Station 1	Roots	9-117-9-116	0			
R-48	Edmonds WWTP	Roots	9-363A-9-363	0			
R-49	Edmonds WWTP	Roots	9-273-9-274	0			
R-50	Edmonds WWTP	Roots	9-287-9-286	0			
R-51	Edmonds WWTP	Roots	9-273A-9-273	0			
R-52	Lift Station 9	Roots	9-150-5-336	0			
R-53	Edmonds WWTP	Roots	11-14-11-13	0			
R-54	Lift Station 1	Roots	8-193-8-192	0			
R-55	Metro	Roots	13-8E-13-166A	0			
R-56	Metro	Roots	13-139-13-142	0			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
R-57	Metro	Roots	17-55-17-58	0			
R-58	Metro	Roots	17-24-17-25	0			
R-59	Metro	Roots	17-57-17-58	0			
R-60	Metro	Roots	13-22A-13-22B	0			
R-61	Edmonds WWTP	Roots	15-3A-15-2A	0			
R-62	Metro	Roots	17-25-17-26	0			
R-63	Metro	Roots	16-37-16-38	0			
	Depressions in Pipe						
DP-1	Lift Station 1	Depressions in Pipe	4-132-4-131	0			Camera Under Water
DP-2	Lift Station 1	Depressions in Pipe	4-163-4-162	8			Camera Under Water
DP-3	Lift Station 12	Depressions in Pipe	1-31-1-30	0			Camera Under Water
DP-4	Lift Station 3	Depressions in Pipe	4-60-4-62	6			Camera Under Water
DP-5	Lift Station 1	Depressions in Pipe	4-100-4-100A	9			Camera Under Water
DP-6	Lift Station 3	Depressions in Pipe	4-60-4-62	2			Water Level
DP-7	Lynnwood WWTP	Depressions in Pipe	5-144-5-145	1			Camera Under Water
DP-8	Lift Station 1	Depressions in Pipe	5-42-5-41	0			Water Level
DP-9	Lynnwood WWTP	Depressions in Pipe	5-322-5N-2	0			Camera Under Water
DP-10	Lift Station 1	Depressions in Pipe	4-79-4-78	0			Camera Under Water
DP-11	Lynnwood WWTP	Depressions in Pipe	3-23-3-24	0			Camera Under Water
DP-12	Lynnwood WWTP	Depressions in Pipe	5-321A-5-322	0			Camera Under Water
DP-13	Lift Station 1	Depressions in Pipe	5-42-5-41	0			Water Level
DP-14	Lift Station 1	Depressions in Pipe	4-78-8-244	0			Camera Under Water
DP-15	Lift Station 1	Depressions in Pipe	4-86-4-85	36			Camera Under Water
DP-16	Lift Station 3	Depressions in Pipe	4-70A-4-71-LIFT 3	0			Camera Under Water
DP-17	Lift Station 3	Depressions in Pipe	4-65-4-67	0			Camera Under Water
DP-18	Lynnwood WWTP	Depressions in Pipe	5-177-5-176	0			Camera Under Water
DP-19	Lynnwood WWTP	Depressions in Pipe	5-325-5N-11	6			Camera Under Water
DP-20	Metro	Depressions in Pipe	17-97-17-96	0			Camera Under Water
DP-21	Lynnwood WWTP	Depressions in Pipe	5-7-5-8	0			Camera Under Water
DP-22	Lift Station 1	Depressions in Pipe	5-267-5-261	12			Camera Under Water
DP-23	Lift Station 12	Depressions in Pipe	3-2H-3-2I	24			Sag
DP-24	Lift Station 9	Depressions in Pipe	5-300-5-301	0			Camera Under Water
DP-25	Metro	Depressions in Pipe	17-98-17-97	0			Camera Under Water
DP-26	Lynnwood WWTP	Depressions in Pipe	5-7-5-8	0			Camera Under Water
DP-27	Lynnwood WWTP	Depressions in Pipe	5-187-5-191	0			Camera Under Water
DP-28	Edmonds WWTP	Depressions in Pipe	8-4-8-5	30			Camera Under Water
DP-29	Metro	Depressions in Pipe	17-96-17-95	0			Camera Under Water
DP-30	Lynnwood WWTP	Depressions in Pipe	5-325-5N-11	9			Camera Under Water
DP-31	Lift Station 12	Depressions in Pipe	1-43-1-24	0			Camera Under Water
DP-32	Lynnwood WWTP	Depressions in Pipe	2-47-2-49	0			Camera Under Water
DP-33	Edmonds WWTP	Depressions in Pipe	8-4-8-5	46			Camera Under Water
DP-34	Metro	Depressions in Pipe	16-101-16-102	3			Sag
DP-35	Lift Station 1	Depressions in Pipe	5-267-5-261	11			Camera Under Water
DP-36	Edmonds WWTP	Depressions in Pipe	7-47-7-50	0			Camera Under Water
DP-37	Lift Station 1	Depressions in Pipe	5-260-5-344	6			Camera Under Water
DP-38	Lift Station 1	Depressions in Pipe	5-267-5-261	6			Camera Under Water
DP-39	Lift Station 1	Depressions in Pipe	5-261-5-260	25			Camera Under Water
DP-40	Lift Station 1	Depressions in Pipe	5-267-5-261	12			Camera Under Water
DP-41	Lift Station 9	Depressions in Pipe	5-283-5-288	0			Camera Under Water
DP-42	Lynnwood WWTP	Depressions in Pipe	3-8-3-9	0			Camera Under Water
DP-43	Lift Station 1	Depressions in Pipe	5-267-5-261	5			Camera Under Water
DP-44	Lift Station 1	Depressions in Pipe	5-260-5-344	7			Camera Under Water
DP-45	Lift Station 1	Depressions in Pipe	5-260-5-344	5			Camera Under Water
DP-46	Lift Station 1	Depressions in Pipe	5-261-5-260	4			Camera Under Water
DP-47	Lift Station 1	Depressions in Pipe	8-99-8-316	0			Camera Under Water
DP-48	Lynnwood WWTP	Depressions in Pipe	3-12-2-2	0			Camera Under Water
DP-49	Lift Station 1	Depressions in Pipe	5-261-5-260	39			Camera Under Water
DP-50	Lift Station 1	Depressions in Pipe	5-260-5-344	7			Camera Under Water
DP-51	Lift Station 1	Depressions in Pipe	5-260-5-344	8			Camera Under Water
DP-52	Lift Station 1	Depressions in Pipe	8-182-8-179	10			Camera Under Water
DP-53	Lift Station 1	Depressions in Pipe	8-99-8-316	0			Camera Under Water
DP-54	Edmonds WWTP	Depressions in Pipe	8-3-8-4	33			Camera Under Water
DP-55	Edmonds WWTP	Depressions in Pipe	8-4-8-5	97			Camera Under Water
DP-56	Edmonds WWTP	Depressions in Pipe	8-3-8-4	26			Camera Under Water
DP-57	Edmonds WWTP	Depressions in Pipe	8-34-8-35	0			Camera Under Water
DP-58	Edmonds WWTP	Depressions in Pipe	8-3-8-4	5			Camera Under Water
DP-59	Edmonds WWTP	Depressions in Pipe	8-31-8-30	0			Camera Under Water
DP-60	Lift Station 1	Depressions in Pipe	8-268-8-267	0			Sag
DP-61	Edmonds WWTP	Depressions in Pipe	8-31-8-30	0			Camera Under Water
DP-62	Edmonds WWTP	Depressions in Pipe	8-37-8-39	0			Camera Under Water

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
DP-63	Edmonds WWTP	Depressions in Pipe	8-73-8-74	0			Camera Under Water
DP-64	Edmonds WWTP	Depressions in Pipe	8-49-8-53	0			Camera Under Water
DP-65	Lift Station 1	Depressions in Pipe	8-182-8-179	5			Camera Under Water
DP-66	Edmonds WWTP	Depressions in Pipe	8-107-8-106	0			Camera Under Water
DP-67	Lift Station 1	Depressions in Pipe	8-167-8-165	0			Camera Under Water
DP-68	Edmonds WWTP	Depressions in Pipe	8-89-8-108	0			Camera Under Water
DP-69	Edmonds WWTP	Depressions in Pipe	8-91-8-106	0			Camera Under Water
DP-70	Lift Station 1	Depressions in Pipe	5-267-5-261	8			Camera Under Water
DP-71	Lift Station 1	Depressions in Pipe	8-147-8-146	0			Camera Under Water
DP-72	Lift Station 1	Depressions in Pipe	8-265-8-266	0			Camera Under Water
DP-73	Lynnwood WWTP	Depressions in Pipe	5-195A-5-196	0			Camera Under Water
DP-74	Edmonds WWTP	Depressions in Pipe	8-29-8-43	0			Camera Under Water
DP-75	Lift Station 9	Depressions in Pipe	5-334A-5-334	0			Camera Under Water
DP-76	Edmonds WWTP	Depressions in Pipe	9-270-9-308	0			Camera Under Water
DP-77	Edmonds WWTP	Depressions in Pipe	12-149A-12-149	0			Camera Under Water
DP-78	Edmonds WWTP	Depressions in Pipe	7-48-7-47	0			Camera Under Water
DP-79	Edmonds WWTP	Depressions in Pipe	7-23-7-53D	0			Camera Under Water
DP-80	Edmonds WWTP	Depressions in Pipe	12-180-12-181	0			Sag
DP-81	Edmonds WWTP	Depressions in Pipe	7-30C-7-30	0			Camera Under Water
DP-82	Edmonds WWTP	Depressions in Pipe	7-50-7-52	0			Camera Under Water
DP-83	Edmonds WWTP	Depressions in Pipe	12-84A-12-83	20			Camera Under Water
DP-84	Edmonds WWTP	Depressions in Pipe	12-84A-12-83	13			Camera Under Water
DP-85	Edmonds WWTP	Depressions in Pipe	12-102-12-101	0			Camera Under Water
DP-86	Edmonds WWTP	Depressions in Pipe	12-133-12-134	0			Camera Under Water
DP-87	Lift Station 1	Depressions in Pipe	8-340-8-339	0			Sag
DP-88	Edmonds WWTP	Depressions in Pipe	12-133-12-134	0			Camera Under Water
DP-89	Edmonds WWTP	Depressions in Pipe	8-3-8-4	44			Camera Under Water
DP-90	Edmonds WWTP	Depressions in Pipe	11-23A-11-21	0			Camera Under Water
DP-91	Edmonds WWTP	Depressions in Pipe	8-81B-8-81	0			Camera Under Water
DP-92	Edmonds WWTP	Depressions in Pipe	12-185F-12-185A	108			Water Level
DP-93	Metro	Depressions in Pipe	14-49-14-49D	0			Camera Under Water
DP-94	Metro	Depressions in Pipe	13-4A-13-4	0			Camera Under Water
DP-95	Lift Station 1	Depressions in Pipe	9-137-9-139	0			Camera Under Water
DP-96	Edmonds WWTP	Depressions in Pipe	9-346-9-347	0			Camera Under Water
DP-97	Edmonds WWTP	Depressions in Pipe	13-120-13-121	11			Sag
DP-98	Edmonds WWTP	Depressions in Pipe	12-133-12-134	0			Camera Under Water
DP-99	Lift Station 1	Depressions in Pipe	8-155-8-352	0			Sag
DP-100	Edmonds WWTP	Depressions in Pipe	9-347-9-348	0			Camera Under Water
DP-101	Edmonds WWTP	Depressions in Pipe	12-133-12-134	0			Camera Under Water
DP-102	Edmonds WWTP	Depressions in Pipe	12-204-12-203	0			Sag
DP-103	Edmonds WWTP	Depressions in Pipe	12-189-12-191	0			Camera Under Water
DP-104	Lift Station 1	Depressions in Pipe	9-100-9-101	0			Camera Under Water
DP-105	Edmonds WWTP	Depressions in Pipe	9-314-9-366	0			Camera Under Water
DP-106	Lift Station 1	Depressions in Pipe	8-222B-8-222A	0			Camera Under Water
DP-107	Edmonds WWTP	Depressions in Pipe	9-188-9-189	4			Camera Under Water
DP-108	Edmonds WWTP	Depressions in Pipe	9-319-9-319A	0			Camera Under Water
DP-109	Lift Station 9	Depressions in Pipe	5-334B-5-334A	0			Camera Under Water
DP-110	Edmonds WWTP	Depressions in Pipe	9-157-9-156	0			Camera Under Water
DP-111	Edmonds WWTP	Depressions in Pipe	9-159-9-158	0			Camera Under Water
DP-112	Metro	Depressions in Pipe	14-7G-14-7F	26			Camera Under Water
DP-113	Lift Station 7	Depressions in Pipe	7-9-7-10	0			Water Level
DP-114	Lift Station 1	Depressions in Pipe	8-303D-8-303C	0			Camera Under Water
DP-115	Edmonds WWTP	Depressions in Pipe	7-34-7-30	0			Camera Under Water
DP-116	Edmonds WWTP	Depressions in Pipe	9-175-9-177	0			Camera Under Water
DP-117	Lift Station 9	Depressions in Pipe	5-334B-5-334A	0			Camera Under Water
DP-118	Edmonds WWTP	Depressions in Pipe	11-23C-11-21	0			Camera Under Water
DP-119	Edmonds WWTP	Depressions in Pipe	9-321-9-322	0			Camera Under Water
DP-120	Edmonds WWTP	Depressions in Pipe	9-175-9-177	0			Camera Under Water
DP-121	Lift Station 7	Depressions in Pipe	7-9-7-10	0			Camera Under Water
DP-122	Edmonds WWTP	Depressions in Pipe	9-289-9-290	0			Water Level
DP-123	Lift Station 1	Depressions in Pipe	9-120-9-121	0			Camera Under Water
DP-124	Edmonds WWTP	Depressions in Pipe	9-193-9-196	0			Camera Under Water
DP-125	Edmonds WWTP	Depressions in Pipe	9-364-9-363	8			Camera Under Water
DP-126	Edmonds WWTP	Depressions in Pipe	9-271-9-270	0			Camera Under Water
DP-127	Lift Station 7	Depressions in Pipe	7-9-7-10	0			Water Level
DP-128	Edmonds WWTP	Depressions in Pipe	9-364-9-363	13			Camera Under Water
DP-129	Edmonds WWTP	Depressions in Pipe	9-279-9-278	16			Camera Under Water
DP-130	Edmonds WWTP	Depressions in Pipe	9-314-9-366	0			Camera Under Water
DP-131	Edmonds WWTP	Depressions in Pipe	9-224-9-202	0			Camera Under Water
DP-132	Lift Station 1	Depressions in Pipe	9-55A-9-55	0			Camera Under Water

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
DP-133	Edmonds WWTP	Depressions in Pipe	9-20-9-19	0			Camera Under Water
DP-134	Metro	Depressions in Pipe	10-25-10-26	0			Camera Under Water
DP-135	Edmonds WWTP	Depressions in Pipe	11-15-11-14	0			Camera Under Water
DP-136	Lift Station 12	Depressions in Pipe	1-36A-1-36	0			Sag
DP-137	Edmonds WWTP	Depressions in Pipe	11-9A-7-35	0			Water Level
DP-138	Edmonds WWTP	Depressions in Pipe	9-201-9-202	0			Camera Under Water
DP-139	Edmonds WWTP	Depressions in Pipe	12-52-12-53	0			Camera Under Water
DP-140	Edmonds WWTP	Depressions in Pipe	9-274A-9-274	15			Camera Under Water
DP-141	Metro	Depressions in Pipe	9-253-9-254	0			Camera Under Water
DP-142	Edmonds WWTP	Depressions in Pipe	8-3-8-4	29			Camera Under Water
DP-143	Edmonds WWTP	Depressions in Pipe	8-3-8-4	44			Camera Under Water
DP-144	Edmonds WWTP	Depressions in Pipe	9-19-9-18	0			Camera Under Water
DP-145	Edmonds WWTP	Depressions in Pipe	9-20-9-19	0			Sag
DP-146	Edmonds WWTP	Depressions in Pipe	11-9A-7-35	0			Water Level
DP-147	Edmonds WWTP	Depressions in Pipe	9-202-9-20	0			Camera Under Water
DP-148	Edmonds WWTP	Depressions in Pipe	12-109A-12-111	0			Camera Under Water
DP-149	Metro	Depressions in Pipe	17-61-17-84	0			Camera Under Water
DP-150	Edmonds WWTP	Depressions in Pipe	12-190-12-189	0			Camera Under Water
DP-151	Metro	Depressions in Pipe	17-75-17-78	0			Camera Under Water
DP-152	Edmonds WWTP	Depressions in Pipe	7-37-7-36	16			Camera Under Water
DP-153	Metro	Depressions in Pipe	17-39-17-46	0			Camera Under Water
DP-154	Metro	Depressions in Pipe	17-19-17-23	0			Camera Under Water
DP-155	Metro	Depressions in Pipe	16-57-16-75	0			Camera Under Water
DP-156	Metro	Depressions in Pipe	17-61-17-84	0			Camera Under Water
DP-157	Metro	Depressions in Pipe	17-87-17-88	0			Camera Under Water
DP-158	Edmonds WWTP	Depressions in Pipe	12-135-12-134	0			Camera Under Water
DP-159	Metro	Depressions in Pipe	17-46-17-47	0			Camera Under Water
DP-160	Metro	Depressions in Pipe	17-61-17-84	0			Camera Under Water
DP-161	Edmonds WWTP	Depressions in Pipe	12-26-12-24	0			Camera Under Water
DP-162	Metro	Depressions in Pipe	17-61-17-84	0			Camera Under Water
DP-163	Metro	Depressions in Pipe	14-34-14-33	0			Camera Under Water
DP-164	Metro	Depressions in Pipe	17-95-17-94	0			Camera Under Water
DP-165	Metro	Depressions in Pipe	14-21-14-4	0			Camera Under Water
DP-166	Metro	Depressions in Pipe	13-4-14-49	0			Camera Under Water
DP-167	Edmonds WWTP	Depressions in Pipe	13-39-13-37	12			Sag
DP-168	Metro	Depressions in Pipe	14-34-14-33	0			Camera Under Water
DP-169	Metro	Depressions in Pipe	17-23-17-39	4			Camera Under Water
DP-170	Metro	Depressions in Pipe	17-23-17-39	16			Camera Under Water
DP-171	Metro	Depressions in Pipe	14-3E-14-3F	0			Camera Under Water
DP-172	Metro	Depressions in Pipe	17-61-17-84	0			Camera Under Water
DP-173	Edmonds WWTP	Depressions in Pipe	13-36-13-35	5			Sag
DP-174	Edmonds WWTP	Depressions in Pipe	13-59-13-60	9			Sag
DP-175	Metro	Depressions in Pipe	14-66-14-65	0			Camera Under Water
DP-176	Metro	Depressions in Pipe	14-46-14-METER	0			Camera Under Water
DP-177	Metro	Depressions in Pipe	14-35-14-34	0			Camera Under Water
DP-178	Metro	Depressions in Pipe	14-11-14-10	0			Camera Under Water
DP-179	Metro	Depressions in Pipe	17-86-17-87	0			Camera Under Water
DP-180	Metro	Depressions in Pipe	14-48-14-50	0			Camera Under Water
DP-181	Metro	Depressions in Pipe	17-23-17-39	0			Camera Under Water
DP-182	Metro	Depressions in Pipe	14-16-14-11	9			Camera Under Water
DP-183	Metro	Depressions in Pipe	17-85-17-86	0			Camera Under Water
DP-184	Metro	Depressions in Pipe	14-38-14-37	0			Camera Under Water
DP-185	Metro	Depressions in Pipe	14-7A-14-7	0			Camera Under Water
DP-186	Metro	Depressions in Pipe	14-66-14-65	0			Camera Under Water
DP-187	Metro	Depressions in Pipe	17-60-17-61	45			Camera Under Water
DP-188	Metro	Depressions in Pipe	13-4-14-49	0			Camera Under Water
DP-189	Edmonds WWTP	Depressions in Pipe	13-57-13-59	14			Sag
DP-190	Edmonds WWTP	Depressions in Pipe	13-53-9-212	9			Sag
DP-191	Metro	Depressions in Pipe	17-88-17-89	0			Camera Under Water
DP-192	Metro	Depressions in Pipe	17-23-17-39	23			Camera Under Water
DP-193	Metro	Depressions in Pipe	17-48-17-59	0			Camera Under Water
DP-194	Metro	Depressions in Pipe	17-47-17-48	0			Camera Under Water
DP-195	Metro	Depressions in Pipe	17-38-17-37	4			Camera Under Water
DP-196	Lift Station 3	Depressions in Pipe	4-60-4-62	1			Water Level
DP-197	Lift Station 9	Depressions in Pipe	5-334B-5-334A	0			Camera Under Water
DP-198	Metro	Depressions in Pipe	14-66-14-65	0			Camera Under Water
DP-199	Metro	Depressions in Pipe	14-69-14-68	0			Camera Under Water
DP-200	Lift Station 2	Depressions in Pipe	8-296-8-297	0			Camera Under Water
DP-201	Edmonds WWTP	Depressions in Pipe	12-160-12-149	0			Camera Under Water
DP-202	Metro	Depressions in Pipe	14-67-14-66	0			Camera Under Water

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
DP-203	Metro	Depressions in Pipe	14-67-14-66	0			Camera Under Water
DP-204	Metro	Depressions in Pipe	17-61-17-84	0			Camera Under Water
DP-205	Metro	Depressions in Pipe	14-67-14-66	0			Camera Under Water
DP-206	Metro	Depressions in Pipe	14-67-14-66	0			Camera Under Water
DP-207	Metro	Depressions in Pipe	17-61-17-84	0			Camera Under Water
DP-208	Metro	Depressions in Pipe	14-66-14-65	0			Camera Under Water
DP-209	Metro	Depressions in Pipe	17-77-17-78	0			Camera Under Water
DP-210	Edmonds WWTP	Depressions in Pipe	7-32C-7-32D	0			Camera Under Water
DP-211	Metro	Depressions in Pipe	14-65-14-64	0			Camera Under Water
DP-212	Metro	Depressions in Pipe	13-4-14-49	0			Camera Under Water
DP-213	Metro	Depressions in Pipe	13-4-14-49	0			Camera Under Water
DP-214	Metro	Depressions in Pipe	17-84-17-85	0			Camera Under Water
DP-215	Lynnwood WWTP	Depressions in Pipe	3-94-3-93	0			Camera Under Water
DP-216	Lynnwood WWTP	Depressions in Pipe	3-94-3-93	0			Camera Under Water
	Problem Joints - Offset General						
PJ-1	Lift Station 1	Problem Joints - Offset	8-97-8-98				
PJ-2	Edmonds WWTP	Problem Joints - Offset	12-204J-12-204I				
PJ-3	Edmonds WWTP	Problem Joints - Offset	12-204I-12-204H				
PJ-4	Lift Station 1	Problem Joints - Offset	9-44-9-43				
PJ-5	Lift Station 1	Problem Joints - Offset	8-178A-8-177A				
	Problem Joints - Offset Small						
PJ-6	Lift Station 1	Problem Joint - Offset Small	5-281A-5-278	N/A			
PJ-7	Lift Station 1	Problem Joint - Offset Small	5-281A-5-278	N/A			
PJ-8	Lift Station 1	Problem Joint - Offset Small	4-134-4-133	N/A			
PJ-9	Lynnwood WWTP	Problem Joint - Offset Small	3-140-3-137	N/A			
PJ-10	Lift Station 10	Problem Joint - Offset Small	2-112-2-111	N/A			
PJ-11	Lift Station 10	Problem Joint - Offset Small	2-111-2-110	N/A			
PJ-12	Lift Station 12	Problem Joint - Offset Small	3-8F-3-8A	N/A			
PJ-13	Lynnwood WWTP	Problem Joint - Offset Small	3-162-3-163	N/A			
PJ-14	Lift Station 12	Problem Joint - Offset Small	3-12F-3-12E	N/A			
PJ-15	Lift Station 1	Problem Joint - Offset Small	8-273-8-272	N/A			
PJ-16	Edmonds WWTP	Problem Joint - Offset Small	13-55-13-56	N/A			
PJ-17	Edmonds WWTP	Problem Joint - Offset Small	9-235B-9-217	N/A			
PJ-18	Edmonds WWTP	Problem Joint - Offset Small	9-235A-9-235B	N/A			
PJ-19	Edmonds WWTP	Problem Joint - Offset Small	13-56-13-57	N/A			
PJ-20	Lift Station 12	Problem Joint - Offset Small	3-12H-3-12I	N/A			
PJ-21	Lift Station 1	Problem Joint - Offset Small	4-134-4-133	N/A			
PJ-22	Lift Station 1	Problem Joint - Offset Small	5-122-5-121	N/A			
PJ-23	Lift Station 12	Problem Joint - Offset Small	3-12H-3-12I	N/A			
PJ-24	Lynnwood WWTP	Problem Joint - Offset Small	3-66E-3-66D	N/A			
PJ-25	Lift Station 12	Problem Joint - Offset Small	3-2I-3-2J	N/A			
PJ-26	Lift Station 12	Problem Joint - Offset Small	3-2I-3-2J	N/A			
	Problem Joints - Offset Medium						
PJ-27	Lift Station 10	Problem Joint - Offset Medium	4-9-4-7	N/A			
PJ-28	Lift Station 1	Problem Joint - Offset Medium	4-140-4-139	N/A			
PJ-29	Edmonds WWTP	Problem Joint - Offset Medium	7-44-7-44A	N/A			
PJ-30	Lift Station 12	Problem Joint - Offset Medium	3-1D-3-2G	N/A			
PJ-31	Edmonds WWTP	Problem Joint - Offset Medium	8-18A-8-18	N/A			
PJ-32	Lift Station 4	Problem Joint - Offset Medium	2-84-2-83	N/A			
PJ-33	Lift Station 10	Problem Joint - Offset Medium	2-112-2-111	N/A			
PJ-34	Lift Station 12	Problem Joint - Offset Medium	3-1D-3-2G	N/A			
PJ-35	Edmonds WWTP	Problem Joint - Offset Medium	8-107-8-106	N/A			
PJ-36	Edmonds WWTP	Problem Joint - Offset Medium	12-266-12-265	N/A			
PJ-37	Edmonds WWTP	Problem Joint - Offset Medium	12-140-12-139	N/A			
PJ-38	Edmonds WWTP	Problem Joint - Offset Medium	13-56-13-57	N/A			
PJ-39	Lift Station 1	Problem Joint - Offset Medium	8-185-8-186	N/A			
PJ-40	Edmonds WWTP	Problem Joint - Offset Medium	9-184-9-185	N/A			
PJ-41	Edmonds WWTP	Problem Joint - Offset Medium	8-UNK 1-8-330A	N/A			
PJ-42	Edmonds WWTP	Problem Joint - Offset Medium	8-UNK 1-8-330A	N/A			
PJ-43	Lift Station 1	Problem Joint - Offset Medium	8-178A-8-177A	N/A			
PJ-44	Metro	Problem Joint - Offset Medium	16-116-16-98	N/A			
PJ-45	Lynnwood WWTP	Problem Joint - Offset Medium	3-60-3-68	N/A			
	Problem Joints - Gaskets Light						
PJ-46	Lynnwood WWTP	Joint Gasket Exposed - Light	3-89-3-72	N/A			Light
PJ-47	Edmonds WWTP	Joint Gasket Exposed - Light	8-54-8-56	N/A			Light
PJ-48	Edmonds WWTP	Joint Gasket Exposed - Light	8-81B-8-81	N/A			Light
	Problem Joints - Gaskets Medium						
PJ-49	Lynnwood WWTP	Joint Gasket Exposed - Medium	3-66E-3-66D	N/A			Medium
PJ-50	Edmonds WWTP	Joint Gasket Exposed - Medium	13-100-13-98	N/A			Medium
	Problem Joints - Gaskets Severe						

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
PJ-51	Edmonds WWTP	Joint Gasket Exposed - Severe	12-134-12-132	N/A			Severe
PJ-52	Metro	Joint Gasket Exposed - Severe	16-59-16-60	N/A			Severe
	Problem Joints - Separation General						
PJ-53	Lift Station 1	Joint separated	8-263-8-252	N/A			
	Problem Joints - Separation Small						
JS-1	Edmonds WWTP	Joint separated - Small	8-39A-8-41	N/A			Small
JS-2	Edmonds WWTP	Joint separated - Small	8-68-8-68A	N/A			Small
JS-3	Edmonds WWTP	Joint separated - Small	12-207-12-206	N/A			Small
JS-4	Lift Station 1	Joint separated - Small	8-197-8-199	N/A			Small
JS-5	Lift Station 1	Joint separated - Small	8-197-8-199	N/A			Small
JS-6	Metro	Joint separated - Small	16-115-16-116	N/A			Small
	Problem Joints - Separation Medium						
JS-7	Edmonds WWTP	Joint separated - Medium	8-68B-8-68	N/A			Medium
JS-8	Edmonds WWTP	Joint separated - Medium	12-140-12-139	N/A			Medium
JS-9	Edmonds WWTP	Joint separated - Medium	12-52-12-53	N/A			Medium
JS-10	Metro	Joint separated - Medium	16-106-16-110	N/A			Medium
	Debris and Deposits						
D/D-1	Lift Station 3	Debris and Deposits	4-60-4-62	N/A			
D/D-2	Lift Station 12	Debris and Deposits	1-67-1-66	N/A			
D/D-3	Lift Station 1	Debris and Deposits	4-163-4-162	N/A			
D/D-4	Lift Station 1	Debris and Deposits	4-100-4-100A	N/A			
D/D-5	Lift Station 12	Debris and Deposits	1-51-1-50	N/A			
D/D-6	Lift Station 1	Debris and Deposits	4-39-4-41	N/A			
D/D-7	Lift Station 1	Debris and Deposits	4-135-4-136	N/A			
D/D-8	Lift Station 1	Debris and Deposits	4-34-4-36	N/A			
D/D-9	Lift Station 1	Debris and Deposits	4-98-4-97	N/A			
D/D-10	Lift Station 3	Debris and Deposits	4-72A-4-72	N/A			
D/D-11	Lift Station 1	Debris and Deposits	4-196-4-200	N/A			
D/D-12	Lift Station 1	Debris and Deposits	4-83-4-82	N/A			
D/D-13	Lift Station 1	Debris and Deposits	4-86-4-85	N/A			
D/D-14	Lynnwood WWTP	Debris and Deposits	2-11-2-10	N/A			
D/D-15	Edmonds WWTP	Debris and Deposits	12-10-12-11	N/A			
D/D-16	Lift Station 12	Debris and Deposits	1-57-1-56	N/A			
D/D-17	Lynnwood WWTP	Debris and Deposits	3-66E-3-66D	N/A			
D/D-18	Lynnwood WWTP	Debris and Deposits	5-164-5-163	N/A			
D/D-19	Edmonds WWTP	Debris and Deposits	7-33-7-32	N/A			
D/D-20	Edmonds WWTP	Debris and Deposits	8-331-8-330	N/A			
D/D-21	Edmonds WWTP	Debris and Deposits	8-73-8-74	N/A			
D/D-22	Edmonds WWTP	Debris and Deposits	12-28-8-2	N/A			
D/D-23	Edmonds WWTP	Debris and Deposits	11-18-7-33	N/A			
D/D-24	Lift Station 1	Debris and Deposits	8-291B-8-291A	N/A			
D/D-25	Edmonds WWTP	Debris and Deposits	12-160-12-149	N/A			
D/D-26	Edmonds WWTP	Debris and Deposits	8-50-8-52	N/A			
D/D-27	Edmonds WWTP	Debris and Deposits	9-270-9-308	N/A			
D/D-28	Lift Station 1	Debris and Deposits	8-178I-8-178J	N/A			
D/D-29	Edmonds WWTP	Debris and Deposits	8-87-8-86	N/A			
D/D-30	Lift Station 1	Debris and Deposits	8-172J-8-172F	N/A			
D/D-31	Edmonds WWTP	Debris and Deposits	12-177-12-176	N/A			
D/D-32	Edmonds WWTP	Debris and Deposits	7-65-7-66	N/A			
D/D-33	Edmonds WWTP	Debris and Deposits	12-98-12-96	N/A			
D/D-34	Edmonds WWTP	Debris and Deposits	12-102-12-101	N/A			
D/D-35	Edmonds WWTP	Debris and Deposits	7-39A-7-39B	N/A			
D/D-36	Lift Station 7	Debris and Deposits	7-9-7-10	N/A			
D/D-37	Edmonds WWTP	Debris and Deposits	12-151A-12-151	N/A			
D/D-38	Edmonds WWTP	Debris and Deposits	12-144-12-146	N/A			
D/D-39	Edmonds WWTP	Debris and Deposits	12-292-12-293	N/A			
D/D-40	Edmonds WWTP	Debris and Deposits	12-180A-12-180	N/A			
D/D-41	Edmonds WWTP	Debris and Deposits	12-289-12-288A	N/A			
D/D-42	Edmonds WWTP	Debris and Deposits	12-151A-12-151	N/A			
D/D-43	Edmonds WWTP	Debris and Deposits	12-185D-12-130	N/A			
D/D-44	Edmonds WWTP	Debris and Deposits	12-292-12-293	N/A			
D/D-45	Lift Station 1	Debris and Deposits	5-239-5-238	N/A			
D/D-46	Edmonds WWTP	Debris and Deposits	15-1B-15-1C	N/A			
D/D-47	Edmonds WWTP	Debris and Deposits	9-188-9-189	N/A			
D/D-48	Lift Station 2	Debris and Deposits	8-298-8-297	N/A			
D/D-49	Lift Station 1	Debris and Deposits	9-109-8-193	N/A			
D/D-50	Edmonds WWTP	Debris and Deposits	12-100-12-99	N/A			
D/D-51	Edmonds WWTP	Debris and Deposits	11-23C-11-21	N/A			
D/D-52	Edmonds WWTP	Debris and Deposits	9-272-9-271	N/A			
D/D-53	Edmonds WWTP	Debris and Deposits	9-273C-9-273B	N/A			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
D/D-54	Edmonds WWTP	Debris and Deposits	9-181-9-182	N/A			
D/D-55	Edmonds WWTP	Debris and Deposits	9-273-9-274	N/A			
D/D-56	Metro	Debris and Deposits	9-247-9-248	N/A			
D/D-57	Lift Station 1	Debris and Deposits	9-62-9-61	N/A			
D/D-58	Metro	Debris and Deposits	16-65-16-77	N/A			
D/D-59	Lift Station 9	Debris and Deposits	9-150-5-336	N/A			
D/D-60	Edmonds WWTP	Debris and Deposits	7-37-7-36	N/A			
D/D-61	Edmonds WWTP	Debris and Deposits	8-85J-8-85F	N/A			
D/D-62	Edmonds WWTP	Debris and Deposits	12-148-12-141	N/A			
D/D-63	Edmonds WWTP	Debris and Deposits	12-140-12-139	N/A			
D/D-64	Edmonds WWTP	Debris and Deposits	11-1-11-2	N/A			
D/D-65	Metro	Debris and Deposits	16-82-16-83	N/A			
D/D-66	Metro	Debris and Deposits	17-43-17-42	N/A			
D/D-67	Edmonds WWTP	Debris and Deposits	12-106-12-107	N/A			
D/D-68	Edmonds WWTP	Debris and Deposits	12-52-12-53	N/A			
D/D-69	Metro	Debris and Deposits	17-75-17-78	N/A			
D/D-70	Edmonds WWTP	Debris and Deposits	13-47-13-46	N/A			
D/D-71	Metro	Debris and Deposits	17-23-17-39	N/A			
D/D-72	Metro	Debris and Deposits	14-19-14-18	N/A			
D/D-73	Metro	Debris and Deposits	13-23B-9-250	N/A			
D/D-74	Metro	Debris and Deposits	14-35-14-34	N/A			
D/D-75	Metro	Debris and Deposits	16-33-16-36	N/A			
D/D-76	Metro	Debris and Deposits	16-39-16-40	N/A			
D/D-77	Metro	Debris and Deposits	17-23-17-39	N/A			
D/D-78	Edmonds WWTP	Debris and Deposits	7-64-7-62	N/A			
D/D-79	Metro	Debris and Deposits	16-95-16-96	N/A			
D/D-80	Edmonds WWTP	Debris and Deposits	7-34-7-30	N/A			
D/D-81	Metro	Debris and Deposits	10-4-10-5	N/A			
D/D-82	Lift Station 1	Debris and Deposits	4-132-4-131	N/A			
D/D-83	Lift Station 4	Debris and Deposits	2-62-2-63	N/A			
	Grease - General						
G-1	Edmonds WWTP	Grease	9-224-9-202	0			
G-2	Edmonds WWTP	Grease	9-224-9-202	0			
	Grease - Light						
G-3	Edmonds WWTP	Grease - Light	7-44A-8-331	5	Light		
G-4	Edmonds WWTP	Grease - Light	9-225-9-224	0	Light		
	Grease - Medium						
G-5	Lift Station 3	Grease - Medium	4-72A-4-72	0	Medium		
G-6	Lift Station 1	Grease - Medium	4-100-4-100A	12	Medium		
G-7	Edmonds WWTP	Grease - Medium	9-364-9-363	105	Medium		
G-8	Metro	Grease - Medium	10-4-10-5	0	Medium		
	Grease - Severe						
G-9	Edmonds WWTP	Grease - Severe	7-65-7-66	10	Severe		
	Problem Laterals - Abandoned						
PL-1	Lynnwood WWTP	Problem Laterals - Abandoned	5-203-5-201	N/A			
PL-2	Metro	Problem Laterals - Abandoned	10-27-10-28	N/A			
PL-3	Metro	Problem Laterals - Abandoned	10-27-10-28	N/A			
PL-4	Metro	Problem Laterals - Abandoned	10-27-10-28	N/A			
PL-5	Edmonds WWTP	Problem Laterals - Abandoned	8-21A-8-51	N/A			
PL-6	Edmonds WWTP	Problem Laterals - Abandoned	8-76-8-75	N/A			
PL-7	Edmonds WWTP	Problem Laterals - Abandoned	8-76-8-75	N/A			
PL-8	Edmonds WWTP	Problem Laterals - Abandoned	8-76-8-75	N/A			
PL-9	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-10	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-11	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-12	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-13	Edmonds WWTP	Problem Laterals - Abandoned	8-77-8-76	N/A			
PL-14	Edmonds WWTP	Problem Laterals - Abandoned	8-52-8-59	N/A			
PL-15	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-16	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-17	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-18	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-19	Edmonds WWTP	Problem Laterals - Abandoned	8-50-8-52	N/A			
PL-20	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-21	Edmonds WWTP	Problem Laterals - Abandoned	8-77-8-76	N/A			
PL-22	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-23	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-24	Edmonds WWTP	Problem Laterals - Abandoned	8-50-8-52	N/A			
PL-25	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-26	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
PL-27	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-28	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-29	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-30	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-31	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-32	Edmonds WWTP	Problem Laterals - Abandoned	8-52-8-59	N/A			
PL-33	Edmonds WWTP	Problem Laterals - Abandoned	8-78-8-77	N/A			
PL-34	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-35	Edmonds WWTP	Problem Laterals - Abandoned	8-78-8-77	N/A			
PL-36	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-37	Edmonds WWTP	Problem Laterals - Abandoned	8-77-8-76	N/A			
PL-38	Edmonds WWTP	Problem Laterals - Abandoned	8-77-8-76	N/A			
PL-39	Edmonds WWTP	Problem Laterals - Abandoned	8-68-8-68A	N/A			
PL-40	Edmonds WWTP	Problem Laterals - Abandoned	8-76-8-75	N/A			
PL-41	Edmonds WWTP	Problem Laterals - Abandoned	8-77-8-76	N/A			
PL-42	Edmonds WWTP	Problem Laterals - Abandoned	8-21A-8-51	N/A			
PL-43	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-44	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-45	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-46	Edmonds WWTP	Problem Laterals - Abandoned	8-68-8-68A	N/A			
PL-47	Edmonds WWTP	Problem Laterals - Abandoned	8-77-8-76	N/A			
PL-48	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-49	Edmonds WWTP	Problem Laterals - Abandoned	8-52-8-59	N/A			
PL-50	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-51	Edmonds WWTP	Problem Laterals - Abandoned	8-58-8-57	N/A			
PL-52	Edmonds WWTP	Problem Laterals - Abandoned	8-77-8-76	N/A			
PL-53	Edmonds WWTP	Problem Laterals - Abandoned	8-50-8-52	N/A			
PL-54	Edmonds WWTP	Problem Laterals - Abandoned	8-50-8-52	N/A			
PL-55	Edmonds WWTP	Problem Laterals - Abandoned	8-68-8-68A	N/A			
PL-56	Edmonds WWTP	Problem Laterals - Abandoned	7-37-7-36	N/A			
PL-57	Edmonds WWTP	Problem Laterals - Abandoned	8-68-8-68A	N/A			
PL-58	Edmonds WWTP	Problem Laterals - Abandoned	8-68-8-68A	N/A			
	Problem Laterals - Connections						
PL-59	Lift Station 12	Problem Laterals - Connections	1-39-1-38	N/A			Lateral Blocked
PL-60	Lynnwood WWTP	Problem Laterals - Connections	5-324-5-324A	N/A			Connection Damaged
PL-61	Edmonds WWTP	Problem Laterals - Connections	8-59-8-58	N/A			Connection Damaged
PL-62	Edmonds WWTP	Problem Laterals - Connections	8-50-8-52	N/A			Connection Damaged
PL-63	Edmonds WWTP	Problem Laterals - Connections	8-54-8-56	N/A			Connection Damaged
PL-64	Edmonds WWTP	Problem Laterals - Connections	8-52-8-59	N/A			Connection Damaged
PL-65	Edmonds WWTP	Problem Laterals - Connections	8-58-8-57	N/A			Connection Damaged
PL-66	Edmonds WWTP	Problem Laterals - Connections	8-58-8-57	N/A			Connection Damaged
PL-67	Edmonds WWTP	Problem Laterals - Connections	8-114-8-113	N/A			Connection Damaged
PL-68	Edmonds WWTP	Problem Laterals - Connections	8-50-8-52	N/A			Connection Damaged
PL-69	Lift Station 1	Problem Laterals - Connections	8-240-8-239	N/A			Connection Damaged
PL-70	Edmonds WWTP	Problem Laterals - Connections	7-66-8-327	N/A			Connection Damaged
PL-71	Edmonds WWTP	Problem Laterals - Connections	12-90-12-87	N/A			Connection Damaged
PL-72	Edmonds WWTP	Problem Laterals - Connections	7-79-7-80	N/A			Connection Damaged
PL-73	Edmonds WWTP	Problem Laterals - Connections	12-154-12-153	N/A			Connection Damaged
PL-74	Edmonds WWTP	Problem Laterals - Connections	7-65-7-66	N/A			Connection Damaged
PL-75	Edmonds WWTP	Problem Laterals - Connections	12-17-12-18	N/A			Connection Damaged
PL-76	Edmonds WWTP	Problem Laterals - Connections	8-18-8-55	N/A			Connection Damaged
PL-77	Edmonds WWTP	Problem Laterals - Connections	12-156-12-155	N/A			Connection Damaged
PL-78	Edmonds WWTP	Problem Laterals - Connections	12-151A-12-151	N/A			Connection Damaged
PL-79	Metro	Problem Laterals - Connections	9-259-9-251	N/A			Connection Damaged
PL-80	Edmonds WWTP	Problem Laterals - Connections	12-144-12-146	N/A			Connection Damaged
PL-81	Edmonds WWTP	Problem Laterals - Connections	12-287-12-286	N/A			Connection Damaged
PL-82	Lift Station 1	Problem Laterals - Connections	8-257-8-257A	N/A			Connection Damaged
PL-83	Lift Station 1	Problem Laterals - Connections	8-150-8-149	N/A			Connection Damaged
PL-84	Edmonds WWTP	Problem Laterals - Connections	12-1-8-1	N/A			Connection Damaged
PL-85	Edmonds WWTP	Problem Laterals - Connections	9-242-9-241	N/A			Connection Damaged
PL-86	Metro	Problem Laterals - Connections	16-59-16-60	N/A			Connection Damaged
PL-87	Edmonds WWTP	Problem Laterals - Connections	12-109-12-110	N/A			Connection Damaged
PL-88	Edmonds WWTP	Problem Laterals - Connections	12-148-12-141	N/A			Connection Damaged
PL-89	Edmonds WWTP	Problem Laterals - Connections	12-13-12-14	N/A			Connection Damaged
PL-90	Edmonds WWTP	Problem Laterals - Connections	12-14-12-15	N/A			Connection Damaged
PL-91	Edmonds WWTP	Problem Laterals - Connections	12-137-12-136	N/A			Connection Damaged
PL-92	Edmonds WWTP	Problem Laterals - Connections	12-6-12-5	N/A			Connection Damaged
PL-93	Edmonds WWTP	Problem Laterals - Connections	12-139-12-138	N/A			Connection Damaged
PL-94	Edmonds WWTP	Problem Laterals - Connections	11-2-11-7	N/A			Connection Damaged
PL-95	Lift Station 3	Problem Laterals - Connections	4-58-4-59	N/A			Connection Protruding

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
PL-96	Lift Station 12	Problem Laterals - Connections	1-9-1-9A	N/A			Connection Protruding
PL-97	Lift Station 1	Problem Laterals - Connections	4-171-4-173A	N/A			Connection Protruding
PL-98	Lift Station 1	Problem Laterals - Connections	5-74-5-72	N/A			Connection Protruding
PL-99	Lift Station 1	Problem Laterals - Connections	5-240B-5-240A	N/A			Connection Protruding
PL-100	Lift Station 1	Problem Laterals - Connections	5-67-5-66	N/A			Connection Protruding
PL-101	Lift Station 9	Problem Laterals - Connections	5-309-5-304	N/A			Connection Protruding
PL-102	Lift Station 1	Problem Laterals - Connections	5-81-5-80	N/A			Connection Protruding
PL-103	Lift Station 1	Problem Laterals - Connections	4-13-4-42	N/A			Connection Protruding
PL-104	Lift Station 1	Problem Laterals - Connections	5-87-5-86	N/A			Connection Protruding
PL-105	Lift Station 1	Problem Laterals - Connections	4-134-4-133	N/A			Connection Protruding
PL-106	Lift Station 1	Problem Laterals - Connections	5-55-5-54	N/A			Connection Protruding
PL-107	Lynnwood WWTP	Problem Laterals - Connections	5-14-5-15	N/A			Connection Protruding
PL-108	Lift Station 1	Problem Laterals - Connections	5-113-5-111	N/A			Connection Protruding
PL-109	Lift Station 3	Problem Laterals - Connections	4-62-4-63	N/A			Connection Protruding
PL-110	Lift Station 1	Problem Laterals - Connections	4-119-4-121	N/A			Connection Protruding
PL-111	Lift Station 1	Problem Laterals - Connections	5-137-5-136	N/A			Connection Protruding
PL-112	Lynnwood WWTP	Problem Laterals - Connections	5-160-5-159	N/A			Connection Protruding
PL-113	Lift Station 4	Problem Laterals - Connections	2-91-2-90	N/A			Connection Protruding
PL-114	Lynnwood WWTP	Problem Laterals - Connections	3-157-3-156	N/A			Connection Protruding
PL-115	Lynnwood WWTP	Problem Laterals - Connections	2-27-2-25	N/A			Connection Protruding
PL-116	Lift Station 1	Problem Laterals - Connections	4-131-4-100	N/A			Connection Protruding
PL-117	Lynnwood WWTP	Problem Laterals - Connections	3-130-3-129	N/A			Connection Protruding
PL-118	Lynnwood WWTP	Problem Laterals - Connections	2-29-2-28	N/A			Connection Protruding
PL-119	Lift Station 1	Problem Laterals - Connections	8-172A-8-172	N/A			Connection Protruding
PL-120	Lift Station 1	Problem Laterals - Connections	5-261-5-260	N/A			Connection Protruding
PL-121	Lift Station 1	Problem Laterals - Connections	5-239-5-238	N/A			Connection Protruding
PL-122	Lynnwood WWTP	Problem Laterals - Connections	3-66E-3-66D	N/A			Connection Protruding
PL-123	Lift Station 1	Problem Laterals - Connections	8-183-8-182	N/A			Connection Protruding
PL-124	Edmonds WWTP	Problem Laterals - Connections	8-53-8-54	N/A			Connection Protruding
PL-125	Edmonds WWTP	Problem Laterals - Connections	8-31-8-30	N/A			Connection Protruding
PL-126	Edmonds WWTP	Problem Laterals - Connections	8-28-8-27	N/A			Connection Protruding
PL-127	Lift Station 1	Problem Laterals - Connections	8-257A-8-254	N/A			Connection Protruding
PL-128	Edmonds WWTP	Problem Laterals - Connections	8-35-8-36	N/A			Connection Protruding
PL-129	Edmonds WWTP	Problem Laterals - Connections	8-64-8-63	N/A			Connection Protruding
PL-130	Edmonds WWTP	Problem Laterals - Connections	8-32-8-31	N/A			Connection Protruding
PL-131	Lift Station 1	Problem Laterals - Connections	8-269-8-267	N/A			Connection Protruding
PL-132	Edmonds WWTP	Problem Laterals - Connections	8-329A-8-329	N/A			Connection Protruding
PL-133	Lift Station 1	Problem Laterals - Connections	8-178-8-177A	N/A			Connection Protruding
PL-134	Lift Station 1	Problem Laterals - Connections	8-255-8-254	N/A			Connection Protruding
PL-135	Edmonds WWTP	Problem Laterals - Connections	8-58-8-57	N/A			Connection Protruding
PL-136	Edmonds WWTP	Problem Laterals - Connections	8-58-8-57	N/A			Connection Protruding
PL-137	Lift Station 1	Problem Laterals - Connections	8-180-8-179	N/A			Connection Protruding
PL-138	Edmonds WWTP	Problem Laterals - Connections	8-112-8-117	N/A			Connection Protruding
PL-139	Edmonds WWTP	Problem Laterals - Connections	12-1-8-1	N/A			Connection Protruding
PL-140	Edmonds WWTP	Problem Laterals - Connections	8-54-8-56	N/A			Connection Protruding
PL-141	Edmonds WWTP	Problem Laterals - Connections	8-87-8-86	N/A			Connection Protruding
PL-142	Edmonds WWTP	Problem Laterals - Connections	12-13-12-14	N/A			Connection Protruding
PL-143	Lift Station 1	Problem Laterals - Connections	9-109-8-193	N/A			Connection Protruding
PL-144	Lift Station 1	Problem Laterals - Connections	8-167-8-165	N/A			Connection Protruding
PL-145	Edmonds WWTP	Problem Laterals - Connections	12-147-12-148	N/A			Connection Protruding
PL-146	Lift Station 1	Problem Laterals - Connections	8-285-8-284	N/A			Connection Protruding
PL-147	Lift Station 1	Problem Laterals - Connections	8-163-8-162	N/A			Connection Protruding
PL-148	Edmonds WWTP	Problem Laterals - Connections	8-335-8-UNK 1	N/A			Connection Protruding
PL-149	Lift Station 10	Problem Laterals - Connections	5-88G-5-88E	N/A			Connection Protruding
PL-150	Edmonds WWTP	Problem Laterals - Connections	12-122-12-121	N/A			Connection Protruding
PL-151	Edmonds WWTP	Problem Laterals - Connections	7-59-7-57	N/A			Connection Protruding
PL-152	Edmonds WWTP	Problem Laterals - Connections	7-43-7-40	N/A			Connection Protruding
PL-153	Lift Station 1	Problem Laterals - Connections	9-36-9-37	N/A			Connection Protruding
PL-154	Edmonds WWTP	Problem Laterals - Connections	7-61-7-60	N/A			Connection Protruding
PL-155	Edmonds WWTP	Problem Laterals - Connections	7-79-7-80	N/A			Connection Protruding
PL-156	Edmonds WWTP	Problem Laterals - Connections	12-98-12-96	N/A			Connection Protruding
PL-157	Edmonds WWTP	Problem Laterals - Connections	7-80-7-61	N/A			Connection Protruding
PL-158	Edmonds WWTP	Problem Laterals - Connections	12-94A-12-94	N/A			Connection Protruding
PL-159	Edmonds WWTP	Problem Laterals - Connections	12-87-12-86	N/A			Connection Protruding
PL-160	Edmonds WWTP	Problem Laterals - Connections	7-43-7-40	N/A			Connection Protruding
PL-161	Edmonds WWTP	Problem Laterals - Connections	12-156-12-155	N/A			Connection Protruding
PL-162	Edmonds WWTP	Problem Laterals - Connections	7-34-7-30	N/A			Connection Protruding
PL-163	Edmonds WWTP	Problem Laterals - Connections	12-69-12-67	N/A			Connection Protruding
PL-164	Edmonds WWTP	Problem Laterals - Connections	12-209-12-207	N/A			Connection Protruding
PL-165	Edmonds WWTP	Problem Laterals - Connections	15-3C-15-3B	N/A			Connection Protruding

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
PL-166	Metro	Problem Laterals - Connections	13-157-13-156	N/A			Connection Protruding
PL-167	Edmonds WWTP	Problem Laterals - Connections	12-1-8-1	N/A			Connection Protruding
PL-168	Lift Station 1	Problem Laterals - Connections	9-109-8-193	N/A			Connection Protruding
PL-169	Lift Station 1	Problem Laterals - Connections	8-291A-8-291	N/A			Connection Protruding
PL-170	Lift Station 1	Problem Laterals - Connections	5-135-5-134	N/A			Connection Protruding
PL-171	Lift Station 2	Problem Laterals - Connections	8-298-8-297	N/A			Connection Protruding
PL-172	Edmonds WWTP	Problem Laterals - Connections	9-234-9-233	N/A			Connection Protruding
PL-173	Edmonds WWTP	Problem Laterals - Connections	7-56-7-55	N/A			Connection Protruding
PL-174	Edmonds WWTP	Problem Laterals - Connections	9-235-9-235A	N/A			Connection Protruding
PL-175	Metro	Problem Laterals - Connections	13-166A-13-166	N/A			Connection Protruding
PL-176	Edmonds WWTP	Problem Laterals - Connections	9-287-9-286	N/A			Connection Protruding
PL-177	Edmonds WWTP	Problem Laterals - Connections	9-273-9-274	N/A			Connection Protruding
PL-178	Edmonds WWTP	Problem Laterals - Connections	8-329A-8-329	N/A			Connection Protruding
PL-179	Lift Station 9	Problem Laterals - Connections	9-150-5-336	N/A			Connection Protruding
PL-180	Edmonds WWTP	Problem Laterals - Connections	12-143-12-142	N/A			Connection Protruding
PL-181	Edmonds WWTP	Problem Laterals - Connections	12-127-12-125	N/A			Connection Protruding
PL-182	Edmonds WWTP	Problem Laterals - Connections	12-129-12-127	N/A			Connection Protruding
PL-183	Metro	Problem Laterals - Connections	9-262C-9-262B	N/A			Connection Protruding
PL-184	Edmonds WWTP	Problem Laterals - Connections	8-UNK 1-8-330A	N/A			Connection Protruding
PL-185	Edmonds WWTP	Problem Laterals - Connections	8-UNK 1-8-330A	N/A			Connection Protruding
PL-186	Edmonds WWTP	Problem Laterals - Connections	12-54-12-53	N/A			Connection Protruding
PL-187	Edmonds WWTP	Problem Laterals - Connections	12-47-12-49	N/A			Connection Protruding
PL-188	Lift Station 1	Problem Laterals - Connections	8-165-8-164	N/A			Connection Protruding
PL-189	Edmonds WWTP	Problem Laterals - Connections	11-7-11-9	N/A			Connection Protruding
PL-190	Edmonds WWTP	Problem Laterals - Connections	12-119-12-117	N/A			Connection Protruding
PL-191	Edmonds WWTP	Problem Laterals - Connections	12-14-12-15	N/A			Connection Protruding
PL-192	Edmonds WWTP	Problem Laterals - Connections	12-121-12-119	N/A			Connection Protruding
PL-193	Edmonds WWTP	Problem Laterals - Connections	12-46-12-46A	N/A			Connection Protruding
PL-194	Edmonds WWTP	Problem Laterals - Connections	12-121-12-119	N/A			Connection Protruding
PL-195	Edmonds WWTP	Problem Laterals - Connections	12-123-12-121	N/A			Connection Protruding
PL-196	Edmonds WWTP	Problem Laterals - Connections	12-5-12-2	N/A			Connection Protruding
PL-197	Edmonds WWTP	Problem Laterals - Connections	12-124-12-123	N/A			Connection Protruding
PL-198	Edmonds WWTP	Problem Laterals - Connections	12-111-12-68	N/A			Connection Protruding
PL-199	Edmonds WWTP	Problem Laterals - Connections	12-125-12-123	N/A			Connection Protruding
PL-200	Edmonds WWTP	Problem Laterals - Connections	7-69-7-70	N/A			Connection Protruding
PL-201	Edmonds WWTP	Problem Laterals - Connections	13-99-13-98	N/A			Connection Protruding
PL-202	Lift Station 1	Problem Laterals - Connections	8-197-8-199	N/A			Connection Protruding
PL-203	Lift Station 1	Problem Laterals - Connections	8-203-8-202	N/A			Connection Protruding
PL-204	Metro	Problem Laterals - Connections	16-37-16-38	N/A			Connection Protruding
PL-205	Metro	Problem Laterals - Connections	14-34-14-33	N/A			Connection Protruding
PL-206	Edmonds WWTP	Problem Laterals - Connections	13-56-13-57	N/A			Connection Protruding
PL-207	Metro	Problem Laterals - Connections	14-7L-14-7B	N/A			Connection Protruding
PL-208	Lift Station 1	Problem Laterals - Connections	8-178-8-177A	N/A			Connection Protruding
PL-209	Metro	Problem Laterals - Connections	13-166A-13-166	N/A			Connection Protruding
PL-210	Edmonds WWTP	Problem Laterals - Connections	13-87-13-88	N/A			Connection Protruding
PL-211	Metro	Problem Laterals - Connections	14-29-14-28	N/A			Connection Protruding
PL-212	Edmonds WWTP	Problem Laterals - Connections	13-81A-13-81B	N/A			Connection Protruding
PL-213	Metro	Problem Laterals - Connections	13-146-13-145	N/A			Connection Protruding
PL-214	Metro	Problem Laterals - Connections	14-47-14-48	N/A			Connection Protruding
PL-215	Metro	Problem Laterals - Connections	10-6-10-5	N/A			Connection Protruding
PL-216	Lift Station 3	Problem Laterals - Connections	4-60-4-62	N/A			Connection Protruding
PL-217	Lift Station 1	Problem Laterals - Connections	4-30-4-28	N/A			Connection Protruding
PL-218	Lift Station 1	Problem Laterals - Connections	4-196-4-200	N/A			Connection Protruding
PL-219	Metro	Problem Laterals - Connections	16-106-16-110	N/A			Connection Protruding
PL-220	Metro	Problem Laterals - Connections	16-99-16-102	N/A			Connection Protruding
PL-221	Metro	Problem Laterals - Connections	14-70-14-69	N/A			Connection Protruding
PL-222	Lynnwood WWTP	Problem Laterals - Connections	5-152-5-151	N/A			Connection Protruding
PL-223	Edmonds WWTP	Problem Laterals - Connections	7-61-7-60	N/A			Connection Protruding
PL-224	Lift Station 2	Problem Laterals - Connections	8-298-8-297	N/A			Connection Protruding
PL-225	Lift Station 1	Problem Laterals - Connections	5-261-5-260	N/A			Connection Protruding
PL-226	Edmonds WWTP	Problem Laterals - Connections	7-56-7-55	N/A			Connection Protruding
PL-227	Edmonds WWTP	Problem Laterals - Connections	8-76-8-75	N/A			Lateral Blocked
PL-228	Edmonds WWTP	Problem Laterals - Connections	8-55-8-55A	N/A			Lateral Blocked
PL-229	Edmonds WWTP	Problem Laterals - Connections	9-266-9-267	N/A			Lateral Blocked
PL-230	Lift Station 1	Problem Laterals - Connections	8-160-8-159	N/A			Lateral Blocked
PL-231	Lift Station 1	Problem Laterals - Connections	8-303-8-303A	N/A			Lateral Blocked
PL-232	Edmonds WWTP	Problem Laterals - Connections	8-55A-8-57	N/A			Lateral Blocked
PL-233	Edmonds WWTP	Problem Laterals - Connections	12-105B-12-105A	N/A			Lateral Blocked
PL-234	Edmonds WWTP	Problem Laterals - Connections	9-347-9-348	N/A			Lateral Blocked
PL-235	Lift Station 1	Problem Laterals - Connections	8-155-8-352	N/A			Lateral Blocked

Table F.2 Granite O&M							
No.	Location	Reason	Manhole #	Distance of Run (ft)	Pipe Type	Sheet No.	Other Description
PL-236	Lift Station 1	Problem Laterals - Connections	8-257-8-257A	N/A			Lateral Blocked
PL-237	Edmonds WWTP	Problem Laterals - Connections	9-11-9-10	N/A			Lateral Blocked
PL-238	Edmonds WWTP	Problem Laterals - Connections	11-6-11-5	N/A			Lateral Blocked
PL-239	Lift Station 1	Problem Laterals - Connections	8-269-8-267	N/A			TV from other end
PL-240	Lift Station 1	Problem Laterals - Connections	8-178-8-177A	N/A			TV from other end
PL-241	Lift Station 1	Problem Laterals - Connections	8-180-8-179	N/A			TV from other end
PL-242	Edmonds WWTP	Problem Laterals - Connections	7-43-7-40	N/A			TV from other end
PL-243	Edmonds WWTP	Problem Laterals - Connections	7-61-7-60	N/A			TV from other end
PL-244	Edmonds WWTP	Problem Laterals - Connections	7-79-7-80	N/A			TV from other end
PL-245	Edmonds WWTP	Problem Laterals - Connections	13-81A-13-81B	N/A			TV from other end
PL-246	Metro	Problem Laterals - Connections	14-7L-14-7B	N/A			TV from other end
PL-247	Lift Station 4	Problem Laterals - Connections	2-131-2-132	N/A			
PL-248	Edmonds WWTP	Problem Laterals - Connections	8-UNK 1-8-330A	N/A			

Table F.3 Granite Known Deficiencies - Trenchless Repair							
Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	CIP No.
Roots - Heavy							
ROOTS	HR-1	Lift Station 1	Heavy Root Problem	4-141-4-142	0		
ROOTS	HR-2	Lift Station 1	Heavy Root Problem	5-30-5-28	0		
ROOTS	HR-3	Lift Station 1	Heavy Root Problem	4-196-4-200	0		
ROOTS	HR-4	Lift Station 10	Heavy Root Problem	2-113A-2-113	0		
ROOTS	HR-5	Lift Station 1	Heavy Root Problem	4-144-4-145	0		
ROOTS	HR-6	Lift Station 10	Heavy Root Problem	2-112-2-111	0		
ROOTS	HR-7	Lynnwood WWTP	Heavy Root Problem	5-148B-5-149	0		
ROOTS	HR-8	Lift Station 10	Heavy Root Problem	2-113E-2-113	1		
ROOTS	HR-9	Lynnwood WWTP	Heavy Root Problem	3-109H-3-109G	0		
ROOTS	HR-10	Lynnwood WWTP	Heavy Root Problem	3-84A-3-85	0		
ROOTS	HR-11	Lynnwood WWTP	Heavy Root Problem	3-103-3-105	0		
ROOTS	HR-12	Lift Station 1	Heavy Root Problem	5-37-5-38	0		
ROOTS	HR-13	Lift Station 1	Heavy Root Problem	8-136-8-137	0		
ROOTS	HR-14	Lift Station 1	Heavy Root Problem	8-136-8-137	0		
ROOTS	HR-15	Edmonds WWTP	Heavy Root Problem	8-78-8-77	0		
ROOTS	HR-16	Lift Station 1	Heavy Root Problem	8-249-8-265	0		
ROOTS	HR-17	Edmonds WWTP	Heavy Root Problem	12-159-12-160	0		
ROOTS	HR-18	Lift Station 1	Heavy Root Problem	8-178I-8-178J	0		
ROOTS	HR-19	Edmonds WWTP	Heavy Root Problem	12-243-12-241	0		
ROOTS	HR-20	Metro	Heavy Root Problem	16-25-16-26	0		
ROOTS	HR-21	Lift Station 1	Heavy Root Problem	8-136-8-137	0		
ROOTS	HR-22	Edmonds WWTP	Heavy Root Problem	7-49-7-49A	0		
ROOTS	HR-23	Edmonds WWTP	Heavy Root Problem	12-105B-12-105A	0		
ROOTS	HR-24	Edmonds WWTP	Heavy Root Problem	12N-79-13-65B	0		
ROOTS	HR-25	Lift Station 1	Heavy Root Problem	8-136-8-137	0		
ROOTS	HR-26	Metro	Heavy Root Problem	14-19-14-18	0		
ROOTS	HR-27	Metro	Heavy Root Problem	13-113-13-112	0		
ROOTS	HR-28	Metro	Heavy Root Problem	13-113-13-112	0		
ROOTS	HR-29	Edmonds WWTP	Heavy Root Problem	12-246-12-243	0		
ROOTS	HR-30	Lift Station 9	Heavy Root Problem	9-341-9-340A	0		
ROOTS	HR-31	Lift Station 9	Heavy Root Problem	9-342-9-341	0		
ROOTS	HR-32	Edmonds WWTP	Heavy Root Problem	12-289-12-288A	0		
ROOTS	HR-33	Edmonds WWTP	Heavy Root Problem	12-293-12-293A	0		
ROOTS	HR-34	Lift Station 1	Heavy Root Problem	5-135-5-134	0		
ROOTS	HR-35	Lift Station 1	Heavy Root Problem	8-175-8-174	0		
ROOTS	HR-36	Edmonds WWTP	Heavy Root Problem	15-1B-15-1C	0		
ROOTS	HR-37	Edmonds WWTP	Heavy Root Problem	15-3B-15-3A	0		
ROOTS	HR-38	Lift Station 1	Heavy Root Problem	8-207-8-206	0		
ROOTS	HR-39	Edmonds WWTP	Heavy Root Problem	9-299-9-298	0		
ROOTS	HR-40	Edmonds WWTP	Heavy Root Problem	9-276-9-277	0		
ROOTS	HR-41	Edmonds WWTP	Heavy Root Problem	9-363A-9-363	0		
ROOTS	HR-42	Edmonds WWTP	Heavy Root Problem	9-363A-9-363	0		
ROOTS	HR-43	Edmonds WWTP	Heavy Root Problem	9-363A-9-363	0		
ROOTS	HR-44	Edmonds WWTP	Heavy Root Problem	8-85K-8-85F	0		
ROOTS	HR-45	Edmonds WWTP	Heavy Root Problem	9-363A-9-363	0		
ROOTS	HR-46	Edmonds WWTP	Heavy Root Problem	9-225-9-224	0		
ROOTS	HR-47	Metro	Heavy Root Problem	10-19-10-19B	0		
ROOTS	HR-48	Edmonds WWTP	Heavy Root Problem	11-8-11-7	0		
ROOTS	HR-49	Metro	Heavy Root Problem	13-8E-13-166A	0		
ROOTS	HR-50	Edmonds WWTP	Heavy Root Problem	8-85K-8-85F	0		
ROOTS	HR-51	Metro	Heavy Root Problem	13-21A-13-21	0		
ROOTS	HR-52	Edmonds WWTP	Heavy Root Problem	13-63B-13-63C	0		
ROOTS	HR-53	Metro	Heavy Root Problem	14-56-14-62	0		
ROOTS	HR-54	Edmonds WWTP	Heavy Root Problem	11-8-11-7	0		
Problem Joints - Infiltration							
PROBLEM JOINTS	PJ-54	Edmonds WWTP	Infiltration in the Joint	8-72-8-73	N/A	Light	
PROBLEM JOINTS	PJ-55	Lift Station 1	Infiltration in the Joint	9-170-9-172	N/A	Light	
PROBLEM JOINTS	PJ-56	Lift Station 1	Infiltration in the Joint	9-136-9-136A	N/A	Medium	
Problem Joints - Joint Separation - Large							
PROBLEM JOINTS	PJ-57	Lift Station 10	Joint separated - Large	4-3-2-113B	N/A		
PROBLEM JOINTS	PJ-58	Lynnwood WWTP	Joint separated - Large	3-66E-3-66D	N/A		
PROBLEM JOINTS	PJ-59	Lift Station 1	Joint separated - Large	8-346-8-343	N/A		
PROBLEM JOINTS	PJ-60	Edmonds WWTP	Joint separated - Large	8-2D-8-2B	N/A		
PROBLEM JOINTS	PJ-61	Edmonds WWTP	Joint separated - Large	8-2D-8-2B	N/A		
Breach - Crack, Circular Narrow							
BREACH	B-1	Lift Station 3	Crack	4-52-4-52A	0	Circular - Narrow	
BREACH	B-2	Lynnwood WWTP	Crack	3-109B-3-109A	0	Circular - Narrow	
BREACH	B-3	Lynnwood WWTP	Crack	3-1H-3-3A2	0	Circular - Narrow	
BREACH	B-4	Lynnwood WWTP	Crack	5-319-5-320	0	Circular - Narrow	
BREACH	B-5	Lift Station 1	Crack	8-287-8-286	0	Circular - Narrow	
BREACH	B-6	Edmonds WWTP	Crack	8-58-8-57	0	Circular - Narrow	
BREACH	B-7	Edmonds WWTP	Crack	8-332-8-331	1	Circular - Narrow	

Table F.3 Granite Known Deficiencies - Trenchless Repair							
Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	CIP No.
BREACH	B-8	Edmonds WWTP	Crack	8-50-8-52	0	Circular - Narrow	
BREACH	B-9	Edmonds WWTP	Crack	8-107-8-106	0	Circular - Narrow	
BREACH	B-10	Edmonds WWTP	Crack	12-16-12-17	0	Circular - Narrow	
BREACH	B-11	Lift Station 1	Crack	8-287-8-286	0	Circular - Narrow	
BREACH	B-12	Lift Station 1	Crack	8-243-8-242	0	Circular - Narrow	
BREACH	B-13	Lift Station 1	Crack	7-77-7-76	0	Circular - Narrow	
BREACH	B-14	Lift Station 1	Crack	7-77-7-76	0	Circular - Narrow	
BREACH	B-15	Lift Station 1	Crack	8-243-8-242	1	Circular - Narrow	
BREACH	B-16	Edmonds WWTP	Crack	12-84A-12-83	0	Circular - Narrow	
BREACH	B-17	Lift Station 1	Crack	7-76-7-75	0	Circular - Narrow	
BREACH	B-18	Edmonds WWTP	Crack	9-274-9-275	0	Circular - Narrow	
BREACH	B-19	Lift Station 1	Crack	8-178A-8-177A	0	Circular - Narrow	
BREACH	B-20	Edmonds WWTP	Crack	9-225-9-224	1	Circular - Narrow	
BREACH	B-21	Edmonds WWTP	Crack	12-143-12-142	0	Circular - Narrow	
BREACH	B-22	Edmonds WWTP	Crack	11-1A-7-39A	0	Circular - Narrow	
BREACH	B-23	Edmonds WWTP	Crack	12-109-12-110	0	Circular - Narrow	
BREACH	B-24	Edmonds WWTP	Crack	11-1-11-2	0	Circular - Narrow	
BREACH	B-25	Metro	Crack	13-22-13-22A	0	Circular - Narrow	
BREACH	B-26	Edmonds WWTP	Crack	13-53-9-212	0	Circular - Narrow	
BREACH	B-27	Edmonds WWTP	Crack	13-53-9-212	0	Circular - Narrow	
BREACH	B-28	Edmonds WWTP	Crack	13-53-9-212	0	Circular - Narrow	
BREACH	B-29	Edmonds WWTP	Crack	11-3-11-2	0	Circular - Narrow	
BREACH	B-30	Edmonds WWTP	Crack	13-53-9-212	0	Circular - Narrow	
BREACH	B-31	Lift Station 1	Crack	8-303B-8-303D	0	Circular - Narrow	
BREACH	B-32	Lift Station 1	Crack	8-303B-8-303D	0	Circular - Narrow	
BREACH	B-33	Edmonds WWTP	Crack	7-34-7-30	0	Circular - Narrow	
BREACH	B-34	Metro	Crack	16-103-16-106	1	Circular - Narrow	
BREACH	B-35	Lift Station 4	Crack	2-91-2-90	0	Circular - Narrow	
BREACH	B-36	Lift Station 1	Crack	4-124-4-123	0	Circular - Wider	
BREACH	B-37	Lift Station 1	Crack	8-98-8-99	0	Circular - Wider	
Breach - Crack, Longitudinal Narrow							
BREACH	B-38	Lift Station 1	Crack	4-217A-4-217	0	Longitudinal - Narrow	
BREACH	B-39	Lynnwood WWTP	Crack	5-221-5-219A	0	Longitudinal - Narrow	
BREACH	B-40	Lift Station 1	Crack	5-260-5-344	1	Longitudinal - Narrow	
BREACH	B-41	Edmonds WWTP	Crack	8-58-8-57	5	Longitudinal - Narrow	
BREACH	B-42	Lift Station 1	Crack	8-285-8-284	0	Longitudinal - Narrow	
BREACH	B-43	Edmonds WWTP	Crack	8-76-8-75	0	Longitudinal - Narrow	
BREACH	B-44	Lift Station 1	Crack	5-261-5-260	1	Longitudinal - Narrow	
BREACH	B-45	Edmonds WWTP	Crack	8-332-8-331	7	Longitudinal - Narrow	
BREACH	B-46	Edmonds WWTP	Crack	8-332-8-331	2	Longitudinal - Narrow	
BREACH	B-47	Edmonds WWTP	Crack	8-50-8-52	8	Longitudinal - Narrow	
BREACH	B-48	Edmonds WWTP	Crack	8-331-8-330	0	Longitudinal - Narrow	
BREACH	B-49	Edmonds WWTP	Crack	8-75-8-57	2	Longitudinal - Narrow	
BREACH	B-50	Edmonds WWTP	Crack	8-77-8-76	2	Longitudinal - Narrow	
BREACH	B-51	Edmonds WWTP	Crack	8-58-8-57	3	Longitudinal - Narrow	
BREACH	B-52	Edmonds WWTP	Crack	8-58-8-57	12	Longitudinal - Narrow	
BREACH	B-53	Lift Station 1	Crack	8-101A-8-100	0	Longitudinal - Narrow	
BREACH	B-54	Lift Station 1	Crack	8-98-8-99	2	Longitudinal - Narrow	
BREACH	B-55	Edmonds WWTP	Crack	8-51-8-50	7	Longitudinal - Narrow	
BREACH	B-56	Edmonds WWTP	Crack	8-50-8-52	13	Longitudinal - Narrow	
BREACH	B-57	Edmonds WWTP	Crack	8-58-8-57	2	Longitudinal - Narrow	
BREACH	B-58	Edmonds WWTP	Crack	8-107-8-106	2	Longitudinal - Narrow	
BREACH	B-59	Lift Station 1	Crack	8-97-8-98	0	Longitudinal - Narrow	
BREACH	B-60	Lift Station 1	Crack	8-281-8-282	1	Longitudinal - Narrow	
BREACH	B-61	Edmonds WWTP	Crack	9-264-9-266	1	Longitudinal - Narrow	
BREACH	B-62	Lift Station 1	Crack	8-285-8-284	0	Longitudinal - Narrow	
BREACH	B-63	Edmonds WWTP	Crack	12-95-12-94	0	Longitudinal - Narrow	
BREACH	B-64	Edmonds WWTP	Crack	12-134-12-132	0	Longitudinal - Narrow	
BREACH	B-65	Edmonds WWTP	Crack	12-93-12-90	0	Longitudinal - Narrow	
BREACH	B-66	Edmonds WWTP	Crack	12-72-12-71	0	Longitudinal - Narrow	
BREACH	B-67	Edmonds WWTP	Crack	7-35-7-33B	1	Longitudinal - Narrow	
BREACH	B-68	Edmonds WWTP	Crack	12-93-12-90	0	Longitudinal - Narrow	
BREACH	B-69	Edmonds WWTP	Crack	7-79-7-80	5	Longitudinal - Narrow	
BREACH	B-70	Edmonds WWTP	Crack	7-79-7-80	0	Longitudinal - Narrow	
BREACH	B-71	Edmonds WWTP	Crack	7-65-7-66	1	Longitudinal - Narrow	
BREACH	B-72	Edmonds WWTP	Crack	8-75-8-57	2	Longitudinal - Narrow	
BREACH	B-73	Edmonds WWTP	Crack	12-226-12-225	0	Longitudinal - Narrow	
BREACH	B-74	Edmonds WWTP	Crack	8-75-8-57	2	Longitudinal - Narrow	
BREACH	B-75	Edmonds WWTP	Crack	12-71-12-89	3	Longitudinal - Narrow	
BREACH	B-76	Edmonds WWTP	Crack	12-51-8-11	1	Longitudinal - Narrow	
BREACH	B-77	Lift Station 1	Crack	8-206-8-205	0	Longitudinal - Narrow	
BREACH	B-78	Metro	Crack	17-31-17-28	1	Longitudinal - Narrow	
BREACH	B-79	Lift Station 9	Crack	9-326-9-327	1	Longitudinal - Narrow	

Table F.3 Granite Known Deficiencies - Trenchless Repair							
Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	CIP No.
BREACH	B-80	Edmonds WWTP	Crack	11-8-11-7	0	Longitudinal - Narrow	
BREACH	B-81	Edmonds WWTP	Crack	12-126-12-125	1	Longitudinal - Narrow	
BREACH	B-82	Edmonds WWTP	Crack	9-224-9-202	7	Longitudinal - Narrow	
BREACH	B-83	Edmonds WWTP	Crack	9-224-9-202	2	Longitudinal - Narrow	
BREACH	B-84	Edmonds WWTP	Crack	12-128-12-127	0	Longitudinal - Narrow	
BREACH	B-85	Edmonds WWTP	Crack	12-8-12-6	1	Longitudinal - Narrow	
BREACH	B-86	Edmonds WWTP	Crack	12-37-12-38	0	Longitudinal - Narrow	
BREACH	B-87	Edmonds WWTP	Crack	7-37-7-36	1	Longitudinal - Narrow	
BREACH	B-88	Edmonds WWTP	Crack	12-143-12-142	0	Longitudinal - Narrow	
BREACH	B-89	Edmonds WWTP	Crack	12-143-12-142	1	Longitudinal - Narrow	
BREACH	B-90	Edmonds WWTP	Crack	12-139-12-138	0	Longitudinal - Narrow	
BREACH	B-91	Edmonds WWTP	Crack	12-55-12-56	0	Longitudinal - Narrow	
BREACH	B-92	Edmonds WWTP	Crack	13-65C-13-65D	8	Longitudinal - Narrow	
BREACH	B-93	Metro	Crack	13-22-13-22A	1	Longitudinal - Narrow	
Breach - Crack, Longitudinal Wider							
BREACH	B-94	Lift Station 4	Crack	2-83-2-82	0	Longitudinal - Wider	
BREACH	B-95	Edmonds WWTP	Crack	8-58-8-57	5	Longitudinal - Wider	
BREACH	B-96	Edmonds WWTP	Crack	8-30-8-29	0	Longitudinal - Wider	
BREACH	B-97	Lift Station 1	Crack	8-240-8-239	1	Longitudinal - Wider	
BREACH	B-98	Edmonds WWTP	Crack	8-112-8-117	1	Longitudinal - Wider	
BREACH	B-99	Edmonds WWTP	Crack	7-46-7-47	0	Longitudinal - Wider	
BREACH	B-100	Lift Station 1	Crack	8-135-8-136	0	Longitudinal - Wider	
BREACH	B-101	Edmonds WWTP	Crack	7-38-7-36	0	Longitudinal - Wider	
BREACH	B-102	Metro	Crack	17-78-17-82	0	Longitudinal - Wider	
BREACH	B-103	Metro	Crack	13-20-13-15	0	Longitudinal - Wider	
BREACH	B-104	Metro	Crack	16-9-16-8	1	Longitudinal - Wider	
Breach - Crack, Multiple Narrow							
BREACH	B-105	Edmonds WWTP	Crack	8-59-8-58	0	Multiple - Narrow	
BREACH	B-106	Lift Station 1	Crack	5-263-5-262	1	Multiple - Narrow	
BREACH	B-107	Lift Station 9	Crack	5-299-5-300	1	Multiple - Narrow	
BREACH	B-108	Edmonds WWTP	Crack	8-59-8-58	18	Multiple - Narrow	
BREACH	B-109	Lynnwood WWTP	Crack	2-29-2-28	0	Multiple - Narrow	
BREACH	B-110	Lynnwood WWTP	Crack	3-131-3-132	0	Multiple - Narrow	
BREACH	B-111	Lift Station 1	Crack	8-219H-8-219G	0	Multiple - Narrow	
BREACH	B-112	Edmonds WWTP	Crack	8-332-8-331	4	Multiple - Narrow	
BREACH	B-113	Edmonds WWTP	Crack	8-75-8-57	2	Multiple - Narrow	
BREACH	B-114	Edmonds WWTP	Crack	8-75-8-57	12	Multiple - Narrow	
BREACH	B-115	Lift Station 1	Crack	8-285-8-284	0	Multiple - Narrow	
BREACH	B-116	Lift Station 1	Crack	8-286-8-285	0	Multiple - Narrow	
BREACH	B-117	Lift Station 1	Crack	8-280-8-281	0	Multiple - Narrow	
BREACH	B-118	Edmonds WWTP	Crack	12-185D-12-130	0	Multiple - Narrow	
BREACH	B-119	Lift Station 1	Crack	8-280-8-281	0	Multiple - Narrow	
BREACH	B-120	Edmonds WWTP	Crack	12-185D-12-130	0	Multiple - Narrow	
BREACH	B-121	Lift Station 1	Crack	7-75-7-74	1	Multiple - Narrow	
BREACH	B-122	Edmonds WWTP	Crack	7-79-7-80	5	Multiple - Narrow	
BREACH	B-123	Edmonds WWTP	Crack	7-50-7-52	20	Multiple - Narrow	
BREACH	B-124	Edmonds WWTP	Crack	7-50-7-52	5	Multiple - Narrow	
BREACH	B-125	Metro	Crack	9-262A-9-262	0	Multiple - Narrow	
BREACH	B-126	Edmonds WWTP	Crack	12-132-12-131	2	Multiple - Narrow	
BREACH	B-127	Edmonds WWTP	Crack	12-249-12-248	0	Multiple - Narrow	
BREACH	B-128	Edmonds WWTP	Crack	8-74-8-75	4	Multiple - Narrow	
BREACH	B-129	Edmonds WWTP	Crack	12-107-12-108	0	Multiple - Narrow	
BREACH	B-130	Edmonds WWTP	Crack	12-248-12-247	0	Multiple - Narrow	
BREACH	B-131	Lift Station 7	Crack	7-9-7-10	0	Multiple - Narrow	
BREACH	B-132	Lift Station 1	Crack	9-117-9-116	0	Multiple - Narrow	
BREACH	B-133	Edmonds WWTP	Crack	9-273A-9-273	1	Multiple - Narrow	
BREACH	B-134	Lift Station 9	Crack	9-150-5-336	0	Multiple - Narrow	
BREACH	B-135	Edmonds WWTP	Crack	11-8-11-7	0	Multiple - Narrow	
BREACH	B-136	Edmonds WWTP	Crack	12-128-12-127	1	Multiple - Narrow	
BREACH	B-137	Edmonds WWTP	Crack	12-196-12-198	1	Multiple - Narrow	
BREACH	B-138	Edmonds WWTP	Crack	12-143-12-142	1	Multiple - Narrow	
BREACH	B-139	Edmonds WWTP	Crack	12-126-12-125	1	Multiple - Narrow	
BREACH	B-140	Edmonds WWTP	Crack	12-106-12-107	0	Multiple - Narrow	
BREACH	B-141	Edmonds WWTP	Crack	12-109-12-110	0	Multiple - Narrow	
BREACH	B-142	Edmonds WWTP	Crack	12-24-12-23	2	Multiple - Narrow	
BREACH	B-143	Edmonds WWTP	Crack	12-143-12-142	1	Multiple - Narrow	
BREACH	B-144	Edmonds WWTP	Crack	12-126-12-125	1	Multiple - Narrow	
BREACH	B-145	Edmonds WWTP	Crack	12-109-12-110	0	Multiple - Narrow	
BREACH	B-146	Edmonds WWTP	Crack	12-107-12-108	0	Multiple - Narrow	
BREACH	B-147	Lift Station 1	Crack	9-59-9-60	0	Multiple - Narrow	
BREACH	B-148	Edmonds WWTP	Crack	13-65C-13-65D	0	Multiple - Narrow	
BREACH	B-149	Metro	Crack	14-66-14-65	0	Multiple - Narrow	
BREACH	B-150	Metro	Crack	10-10-10-7	1	Multiple - Narrow	

Table F.3 Granite Known Deficiencies - Trenchless Repair							
Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	CIP No.
BREACH	B-151	Metro	Crack	14-66-14-65	0	Multiple - Narrow	
BREACH	B-152	Metro	Crack	17-63-17-64	0	Multiple - Narrow	
BREACH	B-153	Edmonds WWTP	Crack	13-53-9-212	0	Multiple - Narrow	
Breach - Crack, Multiple Wider							
BREACH	B-154	Edmonds WWTP	Crack	8-75-8-57	1	Multiple - Wider	
BREACH	B-155	Lift Station 1	Crack	7-76-7-75	5	Multiple - Wider	
BREACH	B-156	Edmonds WWTP	Crack	12-101-12-95	2	Multiple - Wider	
BREACH	B-157	Edmonds WWTP	Crack	12-109-12-110	0	Multiple - Wider	
BREACH	B-158	Edmonds WWTP	Crack	12-106-12-107	0	Multiple - Wider	
Breach - Crack, Spiral Narrow							
BREACH	B-159	Lift Station 1	Crack	8-97-8-98	0	Spiral - Narrow	
BREACH	B-160	Lift Station 1	Crack	8-189-8-194	0	Spiral - Narrow	
BREACH	B-161	Edmonds WWTP	Crack	11-8-11-7	0	Spiral - Narrow	
BREACH	B-162	Edmonds WWTP	Crack	11-8-11-7	0	Spiral - Narrow	
Breach - Crack General							
BREACH	B-163	Lift Station 12	Crack	1-31-1-30	0		
BREACH	B-164	Lift Station 1	Crack	8-240-8-239	0		
Breach - Hole in Pipe							
BREACH	B-165	Edmonds WWTP	Hole in Pipe	11-4-11-3	0		
BREACH	B-166	Edmonds WWTP	Hole in Pipe	11-6-11-5	0		
Breach - Hole in Pipe Small							
BREACH	B-167	Lift Station 1	Hole in Pipe - Small	4-186-4-185	0	SMALL	
BREACH	B-168	Lift Station 4	Hole in Pipe - Small	2-89-2-88	0	SMALL	
BREACH	B-169	Lift Station 10	Hole in Pipe - Small	2-113A-2-113	0	SMALL	
BREACH	B-170	Lift Station 1	Hole in Pipe - Small	5-269-5-267	0	SMALL	
BREACH	B-171	Edmonds WWTP	Hole in Pipe - Small	8-68-8-68A	0	SMALL	
BREACH	B-172	Edmonds WWTP	Hole in Pipe - Small	8-75-8-57	0	SMALL	
BREACH	B-173	Lift Station 1	Hole in Pipe - Small	8-202-8-201	0	SMALL	
BREACH	B-174	Edmonds WWTP	Hole in Pipe - Small	INLET-7-61	0	SMALL	
BREACH	B-175	Edmonds WWTP	Hole in Pipe - Small	12-248-12-247	0	SMALL	
BREACH	B-176	Lift Station 1	Hole in Pipe - Small	9-80A-9-80	0	SMALL	
BREACH	B-177	Edmonds WWTP	Hole in Pipe - Small	8-68B-8-68	0	SMALL	
BREACH	B-178	Edmonds WWTP	Hole in Pipe - Small	12-49-12-50	0	SMALL	
BREACH	B-179	Metro	Hole in Pipe - Small	14-29-14-28	0	SMALL	
BREACH	B-180	Metro	Hole in Pipe - Small	13-22-13-22A	0	SMALL	
BREACH	B-181	Metro	Hole in Pipe - Small	10-6-10-5	0	SMALL	
BREACH	B-182	Edmonds WWTP	Hole in Pipe - Small	12-200-12-112	0	SMALL	
Breach - Hole in Pipe Medium							
BREACH	B-183	Edmonds WWTP	Hole in Pipe - Medium	8-68B-8-68	0	MEDIUM	
BREACH	B-184	Lift Station 7	Hole in Pipe - Medium	7-9-7-10	0	MEDIUM	
BREACH	B-185	Edmonds WWTP	Hole in Pipe - Medium	8-71-8-72	0	MEDIUM	
BREACH	B-186	Edmonds WWTP	Hole in Pipe - Medium	12-134-12-132	0	MEDIUM	
BREACH	B-187	Metro	Hole in Pipe - Medium	10-3-10-4	0	MEDIUM	
BREACH	B-188	Edmonds WWTP	Hole in Pipe - Medium	12-132-12-131	0	MEDIUM	
BREACH	B-189	Edmonds WWTP	Hole in Pipe - Medium	9-301-9-300	0	MEDIUM	
BREACH	B-190	Lift Station 12	Hole in Pipe - Medium	1-16-1-20	0	MEDIUM	
BREACH	B-191	Lift Station 1	Hole in Pipe - Medium	8-245A-8-245	0	MEDIUM	
BREACH	B-192	Edmonds WWTP	Hole in Pipe - Medium	8-59A-8-59	0	MEDIUM	
BREACH	B-193	Metro	Hole in Pipe - Medium	14-3-14-3A	0	MEDIUM	

Table F.4
Composite Capital Improvement Projects

Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.
Miscellaneous Meters		SE Corner of Hwy 99 and 224th St	Clean Flume	14			F.1	
Miscellaneous Meters		22304 Hwy 99	Clean Flume	14			F.1	
Miscellaneous Meters		Edmonds Way Robinhood Lanes	Brush Sensor	15			F.1	
Miscellaneous Meters		244th and Hwy 99 - NW Corner	Clean Flume	16			F.1	
Miscellaneous Meters		Denny's on SR 104 and Hwy 99	Clean Flume	17			F.1	
Miscellaneous Meters		Old Ballinger Pump Station	Clean Flume	17			F.1	
Miscellaneous Meters		East Side, NE Corner of Ballinger PS	Clean Flume	17			F.1	
Miscellaneous Meters		Ballinger Golf Course at 74th Ave	Clean Flume	17			F.1	
BREACH	B-150	Metro	Crack	10-10-10-7	1	Multiple - Narrow	F.2	
ROOTS	HR-47	Metro	Heavy Root Problem	10-19-10-19B	0		F.2	
		7122 210th Street	Grease	10-23-10-25	283	Conc	F.1	
		Metro	Depressions in Pipe	10-25-10-26	0		F.1	Camera Unc
		Metro	Problem Laterals - Abandoned	10-27-10-28	N/A		F.1	
		Metro	Problem Laterals - Abandoned	10-27-10-28	N/A		F.1	
		Metro	Problem Laterals - Abandoned	10-27-10-28	N/A		F.1	
			SUM of Reach	10-27-10-29				
BREACH	B-187	Metro	Hole in Pipe - Medium	10-3-10-4	0	MEDIUM	F.2	
		Metro	Debris and Deposits	10-4-10-5	N/A		F.1	
		Metro	Grease - Medium	10-4-10-5	0	Medium	F.1	
			SUM of Reach	10-4-10-5				
BREACH	B-181	Metro	Hole in Pipe - Small	10-6-10-5	0	SMALL	F.2	
		Metro	Problem Laterals - Connections	10-6-10-5	N/A		F.1	Connection I
			SUM of Reach	10-6-10-5				
		Edmonds WWTP	Medium Root Problem	11-10-11-9B	0		F.1	
BREACH	B-24	Edmonds WWTP	Crack	11-1-11-2	0	Circular - Narrow	F.2	
		Edmonds WWTP	Debris and Deposits	11-1-11-2	N/A		F.1	
			SUM of Reach	11-1-11-2				
BREACH	B-194	Lift Station 12	Deformed	1-11-1-15	0		F.3	
		Edmonds WWTP	Light Root Problem	11-12-11-11	0		F.1	
		Edmonds WWTP	Light Root Problem	11-12-11-11	0		F.1	
		Edmonds WWTP	Light Root Problem	11-12-11-11	0		F.1	
			SUM of Reach	11-12-11-11				
		Edmonds WWTP	Light Root Problem	11-14-11-13	0		F.1	
		Edmonds WWTP	Roots	11-14-11-13	0		F.1	
			SUM of Reach	11-14-11-13				
		Edmonds WWTP	Medium Root Problem	11-14A-11-14	0		F.1	
		Edmonds WWTP	Medium Root Problem	11-14A-11-14	0		F.1	
			SUM of Reach	11-14A-11-14				
		Edmonds WWTP	Depressions in Pipe	11-15-11-14	0		F.1	Camera Unc
		Edmonds WWTP	Debris and Deposits	11-18-7-33	N/A		F.1	
		Edmonds WWTP	Light Root Problem	11-19-11-18	0		F.1	
BREACH	B-22	Edmonds WWTP	Crack	11-1A-7-39A	0	Circular - Narrow	F.2	
		Edmonds WWTP	Problem Laterals - Connections	11-2-11-7	N/A		F.1	Connection I
		Edmonds WWTP	Light Root Problem	11-21A-11-21	0		F.1	
		Edmonds WWTP	Light Root Problem	11-21A-11-21	0		F.1	
		Edmonds WWTP	Light Root Problem	11-21A-11-21	0		F.1	
		Edmonds WWTP	Medium Root Problem	11-21A-11-21	0		F.1	
			SUM of Reach	11-21A-11-21				
BREACH	B-201	Edmonds WWTP	Broken	11-23A-11-21	0		F.3	
		Edmonds WWTP	Light Root Problem	11-23A-11-21	0		F.1	
		Edmonds WWTP	Depressions in Pipe	11-23A-11-21	0		F.1	Camera Unc
			SUM of Reach	11-23A-11-21				
		Edmonds WWTP	Light Root Problem	11-23B-11-21	0		F.1	
		Edmonds WWTP	Light Root Problem	11-23B-11-21	0		F.1	
			SUM of Reach	11-23B-11-21				
		Edmonds WWTP	Depressions in Pipe	11-23C-11-21	0		F.1	Camera Unc
		Edmonds WWTP	Debris and Deposits	11-23C-11-21	N/A		F.1	
			SUM of Reach	11-23C-11-21				
BREACH	B-29	Edmonds WWTP	Crack	11-3-11-2	0	Circular - Narrow	F.2	
BREACH	B-165	Edmonds WWTP	Hole in Pipe	11-4-11-3	0		F.2	
		Edmonds WWTP	Light Root Problem	11-5-11-3	0		F.1	
		Edmonds WWTP	Light Root Problem	11-5-11-3	0		F.1	
		Edmonds WWTP	Light Root Problem	11-5-11-3	0		F.1	
		Edmonds WWTP	Light Root Problem	11-5-11-3	0		F.1	
			SUM of Reach	11-5-11-3				
BREACH	B-166	Edmonds WWTP	Hole in Pipe	11-6-11-5	0		F.2	
		Edmonds WWTP	Light Root Problem	11-6-11-5	0		F.1	
		Edmonds WWTP	Problem Laterals - Connections	11-6-11-5	N/A		F.1	Lateral Blocl
			SUM of Reach	11-6-11-5				
BREACH	B-190	Lift Station 12	Hole in Pipe - Medium	1-16-1-20	0	MEDIUM	F.2	
		Edmonds WWTP	Problem Laterals - Connections	11-7-11-9	N/A		F.1	Connection I
ROOTS	HR-48	Edmonds WWTP	Heavy Root Problem	11-8-11-7	0		F.2	
ROOTS	HR-54	Edmonds WWTP	Heavy Root Problem	11-8-11-7	0		F.2	
BREACH	B-80	Edmonds WWTP	Crack	11-8-11-7	0	Longitudinal - Narrow	F.2	
BREACH	B-135	Edmonds WWTP	Crack	11-8-11-7	0	Multiple - Narrow	F.2	
BREACH	B-161	Edmonds WWTP	Crack	11-8-11-7	0	Spiral - Narrow	F.2	

Table F.4
Composite Capital Improvement Projects

Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.
BREACH	B-162	Edmonds WWTP	Crack	11-8-11-7	0	Spiral - Narrow	F.2	
		Edmonds WWTP	Light Root Problem	11-8-11-7	0		F.1	
		Edmonds WWTP	Light Root Problem	11-8-11-7	0		F.1	
		Edmonds WWTP	Light Root Problem	11-8-11-7	0		F.1	
		Edmonds WWTP	Light Root Problem	11-8-11-7	0		F.1	
		Edmonds WWTP	Medium Root Problem	11-8-11-7	0		F.1	
		Edmonds WWTP	Medium Root Problem	11-8-11-7	0		F.1	
		Edmonds WWTP	Medium Root Problem	11-8-11-7	0		F.1	
		Edmonds WWTP	Medium Root Problem	11-8-11-7	0		F.1	
			SUM of Reach	11-8-11-7				
		Edmonds WWTP	Light Root Problem	11-9A-7-35	0		F.1	
		Edmonds WWTP	Light Root Problem	11-9A-7-35	0		F.1	
		Edmonds WWTP	Light Root Problem	11-9A-7-35	0		F.1	
		Edmonds WWTP	Light Root Problem	11-9A-7-35	0		F.1	
		Edmonds WWTP	Depressions in Pipe	11-9A-7-35	0		F.1	Water Level
		Edmonds WWTP	Depressions in Pipe	11-9A-7-35	0		F.1	Water Level
			SUM of Reach	11-9A-7-35				
		Edmonds WWTP	Debris and Deposits	12-100-12-99	N/A		F.1	
BREACH	B-156	Edmonds WWTP	Crack	12-101-12-95	2	Multiple - Wider	F.2	
BREACH	B-206	Edmonds WWTP	Broken Hole	12-101-12-95	0		F.3	
PIPE REPAIR	PR-19	Edmonds WWTP	Pipe Repair	12-101-12-95	1		F.3	
		Edmonds WWTP	Light Root Problem	12-101-12-95	0		F.1	
		Edmonds WWTP	Roots	12-101-12-95	10		F.1	
			SUM of Reach	12-101-12-95				
		Edmonds WWTP	Debris and Deposits	12-10-12-11	N/A		F.1	
BREACH	B-199	Edmonds WWTP	Broken	12-102-12-101	0		F.3	
		Edmonds WWTP	Depressions in Pipe	12-102-12-101	0		F.1	Camera Unc
		Edmonds WWTP	Debris and Deposits	12-102-12-101	N/A		F.1	
			SUM of Reach	12-102-12-101				
ROOTS	HR-23	Edmonds WWTP	Heavy Root Problem	12-105B-12-105A	0		F.2	
		Edmonds WWTP	Problem Laterals - Connections	12-105B-12-105A	N/A		F.1	Lateral Bloc
			SUM of Reach	12-105B-12-105A				
BREACH	B-216	Edmonds WWTP	Hole in Pipe - Large	12-105M-12-105K	1		F.3	
PROBLEM JOINTS	PJ-75	Edmonds WWTP	Joint Offset - Large	12-105N-12-105M	N/A	Large	F.3	
PROBLEM JOINTS	PJ-76	Edmonds WWTP	Joint Offset - Large	12-105N-12-105M	N/A	Large	F.3	
			SUM of Reach	12-105N-12-105M				
BREACH	B-140	Edmonds WWTP	Crack	12-106-12-107	0	Multiple - Narrow	F.2	
BREACH	B-158	Edmonds WWTP	Crack	12-106-12-107	0	Multiple - Wider	F.2	
		Edmonds WWTP	Debris and Deposits	12-106-12-107	N/A		F.1	
			SUM of Reach	12-106-12-107				
BREACH	B-129	Edmonds WWTP	Crack	12-107-12-108	0	Multiple - Narrow	F.2	
BREACH	B-146	Edmonds WWTP	Crack	12-107-12-108	0	Multiple - Narrow	F.2	
			SUM of Reach	12-107-12-108				
		Edmonds WWTP	Light Root Problem	12-108-12-109	0		F.1	
BREACH	B-23	Edmonds WWTP	Crack	12-109-12-110	0	Circular - Narrow	F.2	
BREACH	B-141	Edmonds WWTP	Crack	12-109-12-110	0	Multiple - Narrow	F.2	
BREACH	B-145	Edmonds WWTP	Crack	12-109-12-110	0	Multiple - Narrow	F.2	
BREACH	B-157	Edmonds WWTP	Crack	12-109-12-110	0	Multiple - Wider	F.2	
		Edmonds WWTP	Problem Laterals - Connections	12-109-12-110	N/A		F.1	Connection I
			SUM of Reach	12-109-12-110				
		Edmonds WWTP	Depressions in Pipe	12-109A-12-111	0		F.1	Camera Unc
		Edmonds WWTP	Problem Laterals - Connections	12-111-12-68	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-119-12-117	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-121-12-119	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-121-12-119	N/A		F.1	Connection I
			SUM of Reach	12-121-12-119				
		Edmonds WWTP	Light Root Problem	12-12-12-13	0		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-122-12-121	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-123-12-121	N/A		F.1	Connection I
			SUM of Reach	12-123-12-121				
		Edmonds WWTP	Problem Laterals - Connections	12-124-12-123	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-125-12-123	N/A		F.1	Connection I
BREACH	B-81	Edmonds WWTP	Crack	12-126-12-125	1	Longitudinal - Narrow	F.2	
BREACH	B-139	Edmonds WWTP	Crack	12-126-12-125	1	Multiple - Narrow	F.2	
BREACH	B-144	Edmonds WWTP	Crack	12-126-12-125	1	Multiple - Narrow	F.2	
			SUM of Reach	12-126-12-125				
		Edmonds WWTP	Problem Laterals - Connections	12-127-12-125	N/A		F.1	Connection I
BREACH	B-84	Edmonds WWTP	Crack	12-128-12-127	0	Longitudinal - Narrow	F.2	
BREACH	B-136	Edmonds WWTP	Crack	12-128-12-127	1	Multiple - Narrow	F.2	
			SUM of Reach	12-128-12-127				
		Edmonds WWTP	Problem Laterals - Connections	12-129-12-127	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-13-12-14	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-13-12-14	N/A		F.1	Connection I
			SUM of Reach	12-13-12-14				
BREACH	B-126	Edmonds WWTP	Crack	12-132-12-131	2	Multiple - Narrow	F.2	

Table F.4
Composite Capital Improvement Projects

Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.
BREACH	B-188	Edmonds WWTP	Hole in Pipe - Medium	12-132-12-131	0	MEDIUM	F.2	
			SUM of Reach	12-132-12-131				
BREACH	B-214	Edmonds WWTP	Hole in Pipe - Large	12-133-12-134	0		F.3	
		Edmonds WWTP	Depressions in Pipe	12-133-12-134	0		F.1	Camera Unc
		Edmonds WWTP	Depressions in Pipe	12-133-12-134	0		F.1	Camera Unc
		Edmonds WWTP	Depressions in Pipe	12-133-12-134	0		F.1	Camera Unc
		Edmonds WWTP	Depressions in Pipe	12-133-12-134	0		F.1	Camera Unc
			SUM of Reach	12-133-12-134				
BREACH	B-64	Edmonds WWTP	Crack	12-134-12-132	0	Longitudinal - Narrow	F.2	
BREACH	B-186	Edmonds WWTP	Hole in Pipe - Medium	12-134-12-132	0	MEDIUM	F.2	
		Edmonds WWTP	Joint Gasket Exposed - Severe	12-134-12-132	N/A		F.1	Severe
			SUM of Reach	12-134-12-132				
		Edmonds WWTP	Light Root Problem	12-135-12-134	0		F.1	
		Edmonds WWTP	Light Root Problem	12-135-12-134	0		F.1	
		Edmonds WWTP	Depressions in Pipe	12-135-12-134	0		F.1	Camera Unc
			SUM of Reach	12-135-12-134				
		Edmonds WWTP	Problem Laterals - Connections	12-137-12-136	N/A		F.1	Connection I
BREACH	B-90	Edmonds WWTP	Crack	12-139-12-138	0	Longitudinal - Narrow	F.2	
		Edmonds WWTP	Problem Laterals - Connections	12-139-12-138	N/A		F.1	Connection I
			SUM of Reach	12-139-12-138				
		Edmonds WWTP	Problem Joint - Offset Medium	12-140-12-139	N/A		F.1	
		Edmonds WWTP	Joint separated - Medium	12-140-12-139	N/A		F.1	Medium
		Edmonds WWTP	Debris and Deposits	12-140-12-139	N/A		F.1	
			SUM of Reach	12-140-12-139				
		Edmonds WWTP	Problem Laterals - Connections	12-14-12-15	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-14-12-15	N/A		F.1	Connection I
			SUM of Reach	12-14-12-15				
BREACH	B-21	Edmonds WWTP	Crack	12-143-12-142	0	Circular - Narrow	F.2	
BREACH	B-88	Edmonds WWTP	Crack	12-143-12-142	0	Longitudinal - Narrow	F.2	
BREACH	B-89	Edmonds WWTP	Crack	12-143-12-142	1	Longitudinal - Narrow	F.2	
BREACH	B-138	Edmonds WWTP	Crack	12-143-12-142	1	Multiple - Narrow	F.2	
BREACH	B-143	Edmonds WWTP	Crack	12-143-12-142	1	Multiple - Narrow	F.2	
		Edmonds WWTP	Problem Laterals - Connections	12-143-12-142	N/A		F.1	Connection I
			SUM of Reach	12-143-12-142				
		Edmonds WWTP	Debris and Deposits	12-144-12-146	N/A		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-144-12-146	N/A		F.1	Connection I
			SUM of Reach	12-144-12-146				
		Edmonds WWTP	Problem Laterals - Connections	12-147-12-148	N/A		F.1	Connection I
		Edmonds WWTP	Debris and Deposits	12-148-12-141	N/A		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-148-12-141	N/A		F.1	Connection I
			SUM of Reach	12-148-12-141				
		Edmonds WWTP	Depressions in Pipe	12-149A-12-149	0		F.1	Camera Unc
		Edmonds WWTP	Light Root Problem	12-151-12-22	0		F.1	
		Edmonds WWTP	Debris and Deposits	12-151A-12-151	N/A		F.1	
		Edmonds WWTP	Debris and Deposits	12-151A-12-151	N/A		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-151A-12-151	N/A		F.1	Connection I
			SUM of Reach	12-151A-12-151				
		Edmonds WWTP	Medium Root Problem	12-153-12-150	0		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-154-12-153	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-156-12-155	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-156-12-155	N/A		F.1	Connection I
			SUM of Reach	12-156-12-155				
		9223 216th Street	Black Water	12-156-13-96	380	Conc	F.1	
ROOTS	HR-17	Edmonds WWTP	Heavy Root Problem	12-159-12-160	0		F.2	
		Edmonds WWTP	Medium Root Problem	12-160-12-149	0		F.1	
		Edmonds WWTP	Depressions in Pipe	12-160-12-149	0		F.1	Camera Unc
		Edmonds WWTP	Debris and Deposits	12-160-12-149	N/A		F.1	
			SUM of Reach	12-160-12-149				
BREACH	B-10	Edmonds WWTP	Crack	12-16-12-17	0	Circular - Narrow	F.2	
		Edmonds WWTP	Light Root Problem	12-16-12-17	0		F.1	
		Edmonds WWTP	Light Root Problem	12-16-12-17	0		F.1	
		Edmonds WWTP	Light Root Problem	12-16-12-17	3		F.1	
		Edmonds WWTP	Light Root Problem	12-16-12-17	0		F.1	
		Edmonds WWTP	Light Root Problem	12-16-12-17	0		F.1	
			SUM of Reach	12-16-12-17				
		Edmonds WWTP	Light Root Problem	12-163-12-162	0		F.1	
		Edmonds WWTP	Light Root Problem	12-165-12-164	0		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-17-12-18	N/A		F.1	Connection I
		Edmonds WWTP	Light Root Problem	12-175-12-146	0		F.1	
		Edmonds WWTP	Light Root Problem	12-175-12-146	0		F.1	
		Edmonds WWTP	Light Root Problem	12-175-12-146	0		F.1	
		Edmonds WWTP	Light Root Problem	12-175-12-146	0		F.1	
		Edmonds WWTP	Light Root Problem	12-175-12-146	0		F.1	
		Edmonds WWTP	Light Root Problem	12-175-12-146	0		F.1	
		Edmonds WWTP	Light Root Problem	12-175-12-146	0		F.1	

Table F.4
Composite Capital Improvement Projects

Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.
			SUM of Reach	12-175-12-146				
		Edmonds WWTP	Debris and Deposits	12-177-12-176	N/A		F.1	
BREACH	B-210	Edmonds WWTP	Broken Hole	12-178-12-179	0		F.3	
		Edmonds WWTP	Depressions in Pipe	12-180-12-181	0		F.1	Sag
		Edmonds WWTP	Light Root Problem	12-180A-12-180	0		F.1	
		Edmonds WWTP	Debris and Deposits	12-180A-12-180	N/A		F.1	
			SUM of Reach	12-180A-12-180				
		Edmonds WWTP	Light Root Problem	12-1-8-1	0		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-1-8-1	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-1-8-1	N/A		F.1	Connection I
		Edmonds WWTP	Problem Laterals - Connections	12-1-8-1	N/A		F.1	Connection I
			SUM of Reach	12-1-8-1				
PIPE REPAIR	PR-12	Edmonds WWTP	Pipe Repair	12-181-12-182	0		F.3	
		Edmonds WWTP	Light Root Problem	12-18-12-19	0		F.1	
		Edmonds WWTP	Light Root Problem	12-182A-12-215	0		F.1	
		Edmonds WWTP	Light Root Problem	12-182A-12-215	0		F.1	
		Edmonds WWTP	Medium Root Problem	12-182A-12-215	0		F.1	
			SUM of Reach	12-182A-12-215				
BREACH	B-118	Edmonds WWTP	Crack	12-185D-12-130	0	Multiple - Narrow	F.2	
BREACH	B-120	Edmonds WWTP	Crack	12-185D-12-130	0	Multiple - Narrow	F.2	
		Edmonds WWTP	Debris and Deposits	12-185D-12-130	N/A		F.1	
			SUM of Reach	12-185D-12-130				
		Edmonds WWTP	Depressions in Pipe	12-185F-12-185A	108		F.1	Water Level
		Edmonds WWTP	Light Root Problem	12-185G-12-185F	0		F.1	
		Edmonds WWTP	Light Root Problem	12-185G-12-185F	0		F.1	
		Edmonds WWTP	Medium Root Problem	12-185G-12-185F	0		F.1	
			SUM of Reach	12-185G-12-185F				
		1153 8th Ave S.	Grit, Black Water	12-189-12-190 c/o	120	Conc	F.1	
		Edmonds WWTP	Depressions in Pipe	12-189-12-191	0		F.1	Camera Unc
		Edmonds WWTP	Depressions in Pipe	12-190-12-189	0		F.1	Camera Unc
		1115 8th Ave S.	Grit, Black Water	12-191-12-189	285	Conc	F.1	
		Edmonds WWTP	Light Root Problem	12-19-12-28	0		F.1	
		Edmonds WWTP	Light Root Problem	12-19-12-28	0		F.1	
		Edmonds WWTP	Light Root Problem	12-19-12-28	0		F.1	
		Edmonds WWTP	Light Root Problem	12-19-12-28	0		F.1	
			SUM of Reach	12-19-12-28				
		736 Fir Street	Black Water	12-192-12-191	200	Conc	F.1	
BREACH	B-137	Edmonds WWTP	Crack	12-196-12-198	1	Multiple - Narrow	F.2	
BREACH	B-182	Edmonds WWTP	Hole in Pipe - Small	12-200-12-112	0	SMALL	F.2	
		Edmonds WWTP	Depressions in Pipe	12-204-12-203	0		F.1	Sag
		Edmonds WWTP	Problem Joints - Offset	12-204I-12-204H			F.1	
		Edmonds WWTP	Problem Joints - Offset	12-204J-12-204I			F.1	
		Edmonds WWTP	Joint separated - Small	12-207-12-206	N/A		F.1	Small
		Edmonds WWTP	Light Root Problem	12-208-12-207	0		F.1	
		Edmonds WWTP	Light Root Problem	12-208-12-207	0		F.1	
		Edmonds WWTP	Light Root Problem	12-208-12-207	0		F.1	
		Edmonds WWTP	Light Root Problem	12-208-12-207	0		F.1	
		Edmonds WWTP	Light Root Problem	12-208-12-207	0		F.1	
		Edmonds WWTP	Light Root Problem	12-208-12-207	0		F.1	
			SUM of Reach	12-208-12-207				
		Edmonds WWTP	Problem Laterals - Connections	12-209-12-207	N/A		F.1	Connection I
		Edmonds WWTP	Light Root Problem	12-2-12-1	0		F.1	
		Edmonds WWTP	Light Root Problem	12-2-12-1	0		F.1	
		Edmonds WWTP	Light Root Problem	12-2-12-1	0		F.1	
		Edmonds WWTP	Light Root Problem	12-2-12-1	0		F.1	
		Edmonds WWTP	Light Root Problem	12-2-12-1	0		F.1	
			SUM of Reach	12-2-12-1				
BREACH	B-200	Edmonds WWTP	Broken	12-212-12-211	0		F.3	
		Edmonds WWTP	Light Root Problem	12-217-12-216	0		F.1	
		Edmonds WWTP	Light Root Problem	12-22-12-20	0		F.1	
BREACH	B-73	Edmonds WWTP	Crack	12-226-12-225	0	Longitudinal - Narrow	F.2	
		Edmonds WWTP	Light Root Problem	12-226-12-225	0		F.1	
			SUM of Reach	12-226-12-225				
		Edmonds WWTP	Light Root Problem	12-234B-12-234A	0		F.1	
BREACH	B-142	Edmonds WWTP	Crack	12-24-12-23	2	Multiple - Narrow	F.2	
ROOTS	HR-19	Edmonds WWTP	Heavy Root Problem	12-243-12-241	0		F.2	
		Edmonds WWTP	Light Root Problem	12-243-12-241	0		F.1	
		Edmonds WWTP	Light Root Problem	12-243-12-241	0		F.1	
		Edmonds WWTP	Roots	12-243-12-241	0		F.1	
			SUM of Reach	12-243-12-241				
ROOTS	HR-29	Edmonds WWTP	Heavy Root Problem	12-246-12-243	0		F.2	
		Edmonds WWTP	Light Root Problem	12-246-12-243	0		F.1	
		Edmonds WWTP	Light Root Problem	12-246-12-243	0		F.1	
		Edmonds WWTP	Medium Root Problem	12-246-12-243	27		F.1	
		Edmonds WWTP	Roots	12-246-12-243	0		F.1	

Table F.4
Composite Capital Improvement Projects

Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.
		Edmonds WWTP	Roots	12-246-12-243	0		F.1	
			SUM of Reach	12-246-12-243				
BREACH	B-130	Edmonds WWTP	Crack	12-248-12-247	0	Multiple - Narrow	F.2	
BREACH	B-175	Edmonds WWTP	Hole in Pipe - Small	12-248-12-247	0	SMALL	F.2	
			SUM of Reach	12-248-12-247				
BREACH	B-127	Edmonds WWTP	Crack	12-249-12-248	0	Multiple - Narrow	F.2	
		Edmonds WWTP	Medium Root Problem	12-250-12-249	0		F.1	
		Edmonds WWTP	Medium Root Problem	12-250-12-249	0		F.1	
			SUM of Reach	12-250-12-249				
		Edmonds WWTP	Depressions in Pipe	12-26-12-24	0		F.1	Camera Unc
		Edmonds WWTP	Problem Joint - Offset Medium	12-266-12-265	N/A		F.1	
BREACH	B-217	Edmonds WWTP	Broken	12-269C-12-269D	0	Soil Visible - Large	F.3	
		Edmonds WWTP	Light Root Problem	12-284F-12-284	0		F.1	
		Edmonds WWTP	Light Root Problem	12-287-12-286	0		F.1	
		Edmonds WWTP	Problem Laterals - Connections	12-287-12-286	N/A		F.1	Connection I
			SUM of Reach	12-287-12-286				
		Edmonds WWTP	Medium Root Problem	12-288-12-287	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	
		Edmonds WWTP	Light Root Problem	12-28-8-2	0		F.1	

Table F.4 Granite Known Deficiencies - Dig up and Replace							
Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	CIP No.
Problem Joints - Offset Large							
PROBLEM JOINTS	PJ-62	Lift Station 1	Joint Offset - Large	5-122-5-121	N/A	Large	
PROBLEM JOINTS	PJ-63	Lift Station 3	Joint Offset - Large	4-52A-4-53	N/A	Large	
PROBLEM JOINTS	PJ-64	Lift Station 1	Joint Offset - Large	5-42-5-41	N/A	Large	
PROBLEM JOINTS	PJ-65	Lift Station 3	Joint Offset - Large	4-52A-4-53	N/A	Large	
PROBLEM JOINTS	PJ-66	Lynnwood WWTP	Joint Offset - Large	3-66E-3-66D	N/A	Large	
PROBLEM JOINTS	PJ-67	Lynnwood WWTP	Joint Offset - Large	3-66A-3-66	N/A	Large	
PROBLEM JOINTS	PJ-68	Lift Station 7	Joint Offset - Large	7-11-7-7	N/A	Large	
PROBLEM JOINTS	PJ-69	Edmonds WWTP	Joint Offset - Large	8-107-8-106	N/A	Large	
PROBLEM JOINTS	PJ-70	Edmonds WWTP	Joint Offset - Large	8-107-8-106	N/A	Large	
PROBLEM JOINTS	PJ-71	Edmonds WWTP	Joint Offset - Large	12-51-8-11	N/A	Large	
PROBLEM JOINTS	PJ-72	Edmonds WWTP	Joint Offset - Large	9-349-9-350	N/A	Large	
PROBLEM JOINTS	PJ-73	Lift Station 1	Joint Offset - Large	8-175-8-174	N/A	Large	
PROBLEM JOINTS	PJ-74	Edmonds WWTP	Joint Offset - Large	9-181-9-182	N/A	Large	
PROBLEM JOINTS	PJ-75	Edmonds WWTP	Joint Offset - Large	12-105N-12-105M	N/A	Large	
PROBLEM JOINTS	PJ-76	Edmonds WWTP	Joint Offset - Large	12-105N-12-105M	N/A	Large	
PROBLEM JOINTS	PJ-77	Metro	Joint Offset - Large	14-3-14-3A	N/A	Large	
PROBLEM JOINTS	PJ-78	Lift Station 1	Joint Offset - Large	5-122-5-121	N/A	Large	
Breach - Deformed							
BREACH	B-194	Lift Station 12	Deformed	1-11-1-15	0		
Breach Broken General							
BREACH	B-195	Edmonds WWTP	Broken	8-50-8-52	0		
BREACH	B-196	Edmonds WWTP	Broken	8-54-8-56	0		
BREACH	B-197	Edmonds WWTP	Broken	8-78-8-77	0		
BREACH	B-198	Edmonds WWTP	Broken	8-29-8-43	0		
BREACH	B-199	Edmonds WWTP	Broken	12-102-12-101	0		
BREACH	B-200	Edmonds WWTP	Broken	12-212-12-211	0		
BREACH	B-201	Edmonds WWTP	Broken	11-23A-11-21	0		
BREACH	B-202	Metro	Broken	13-14-13-13	0		
BREACH	B-203	Metro	Broken	14-7G-14-7F	0		
Breach - Broken Hole							
BREACH	B-204	Lift Station 3	Broken Hole	4-75-4-74	0		
BREACH	B-205	Edmonds WWTP	Broken Hole	7-39C-7-40	0		
BREACH	B-206	Edmonds WWTP	Broken Hole	12-101-12-95	0		
BREACH	B-207	Edmonds WWTP	Broken Hole	8-17-8-18	0		
BREACH	B-208	Edmonds WWTP	Broken Hole	12N-79-13-65B	0		
BREACH	B-209	Edmonds WWTP	Broken Hole	12-75-8-14	0		
BREACH	B-210	Edmonds WWTP	Broken Hole	12-178-12-179	0		
BREACH	B-211	Edmonds WWTP	Broken Hole	12-75-8-14	0		
BREACH	B-212	Lift Station 1	Broken Hole	9-59-9-60	0		
Breach - Broken Hole Large							
BREACH	B-213	Lift Station 4	Hole in Pipe - Large	2-64B-2-68	0		
BREACH	B-214	Edmonds WWTP	Hole in Pipe - Large	12-133-12-134	0		
BREACH	B-215	Edmonds WWTP	Hole in Pipe - Large	12-49-12-50	0		
BREACH	B-216	Edmonds WWTP	Hole in Pipe - Large	12-105M-12-105K	1		
Breach - Broken Soil Visable Large							
BREACH	B-217	Edmonds WWTP	Broken	12-269C-12-269D	0	Soil Visible - Large	
BREACH	B-218	Metro	Broken	14-28-14-27	0	Soil Visible - Large	
Breach - Broken Soil Visable Medium							
BREACH	B-219	Lift Station 1	Broken	4-115-8-219H	0	Soil Visible - Medium	
BREACH	B-220	Lynnwood WWTP	Broken	2-29-2-28	0	Soil Visible - Medium	
BREACH	B-221	Edmonds WWTP	Broken	8-22-8-21	0	Soil Visible - Medium	
BREACH	B-222	Edmonds WWTP	Broken	8-337-8-336A	0	Soil Visible - Medium	
BREACH	B-223	Lift Station 1	Broken	5-246-5-245	0	Soil Visible - Medium	
Breach - Broken Soil Visable Small							
BREACH	B-224	Edmonds WWTP	Broken	8-50-8-52	0	Soil Visible - Small	
BREACH	B-225	Edmonds WWTP	Broken	15-4E-15-4C	0	Soil Visible - Small	
Breach - Broken Void Visable Medium							
BREACH	B-226	Lift Station 1	Broken	8-162-8-161	0	Void Visible - Medium	
BREACH	B-227	Lift Station 1	Broken	8-351-8-350	0	Void Visible - Medium	
Breach - Broken Void Visable Small							
BREACH	B-228	Edmonds WWTP	Broken	7-35-7-33B	0	Void Visible - Small	
BREACH	B-229	Edmonds WWTP	Broken	12-84A-12-83	0	Void Visible - Small	
BREACH	B-230	Lift Station 1	Broken	8-203-8-202	0	Void Visible - Small	
Pipe Repair - General							
PIPE REPAIR	PR-1	Lift Station 12	Pipe Repair	1-75-1-74	4		
PIPE REPAIR	PR-2	Lift Station 12	Pipe Repair	1-46-1-45	0		
PIPE REPAIR	PR-3	Lift Station 12	Pipe Repair	1-36A-1-36	8		
PIPE REPAIR	PR-4	Lift Station 12	Pipe Repair	1-55-1-52	5		
PIPE REPAIR	PR-5	Lift Station 12	Pipe Repair	1-55-1-52	4		
PIPE REPAIR	PR-6	Lift Station 12	Pipe Repair	1-79-1-78	8		
PIPE REPAIR	PR-7	Lift Station 12	Pipe Repair	1-46-1-45	0		
PIPE REPAIR	PR-8	Edmonds WWTP	Pipe Repair	7-39B-7-39C	0		

Table F.4 Granite Known Deficiencies - Dig up and Replace							
Problem Category	Identifier	Location	Reason	Manhole #	Distance of Run (ft)	Comments	CIP No.
PIPE REPAIR	PR-9	Lynnwood WWTP	Pipe Repair	3-65-3-66A	0		
PIPE REPAIR	PR-10	Lift Station 12	Pipe Repair	3-12F-3-12E	2		
PIPE REPAIR	PR-11	Edmonds WWTP	Pipe Repair	8-114-8-113	0		
PIPE REPAIR	PR-12	Edmonds WWTP	Pipe Repair	12-181-12-182	0		
PIPE REPAIR	PR-13	Storm Lines	Pipe Repair	8-322	0		
PIPE REPAIR	PR-14	Edmonds WWTP	Pipe Repair	12-84A-12-83	0		
PIPE REPAIR	PR-15	Edmonds WWTP	Pipe Repair	12-71-12-73	0		
PIPE REPAIR	PR-16	Edmonds WWTP	Pipe Repair	12-75-8-14	0		
PIPE REPAIR	PR-17	Edmonds WWTP	Pipe Repair	12-73-12-75	0		
PIPE REPAIR	PR-18	Edmonds WWTP	Pipe Repair	12N-79-13-65B	3		
PIPE REPAIR	PR-19	Edmonds WWTP	Pipe Repair	12-101-12-95	1		
PIPE REPAIR	PR-20	Edmonds WWTP	Pipe Repair	12-75-8-14	0		
PIPE REPAIR	PR-21	Edmonds WWTP	Pipe Repair	12-57-12-58	0		
PIPE REPAIR	PR-22	Edmonds WWTP	Pipe Repair	9-299-9-298	0		
PIPE REPAIR	PR-23	Metro	Pipe Repair	16-27-16-31	0		
PIPE REPAIR	PR-24	Edmonds WWTP	Pipe Repair	13-65A-12-7	0		
PIPE REPAIR	PR-25	Edmonds WWTP	Pipe Repair	12-42-12-43	0		
PIPE REPAIR	PR-26	Edmonds WWTP	Pipe Repair	16-133-16-134	0		
PIPE REPAIR	PR-27	Metro	Pipe Repair	14-73-14-72	0		
PIPE REPAIR	PR-28	Edmonds WWTP	Pipe Repair	16-128-16-129	0		
PIPE REPAIR	PR-29	Metro	Pipe Repair	14-65-14-64	0		

Table F.5 (similar to Table B.1) Over Capacity						
		Expected Year of Improvement			Improvements Needed	CIP No.
		Anticipated 2013 - 2019	Anticipated 2019 - 2033	Anticipated 2033 - Buildout		
Pipe Segment	Exisitng Diameter (inches)	Proposed Diameter (inches)				
7-32D-ED-WWTP	36	42			Increase Pipe Diameter	
11-20-11-19	24	42			Increase Pipe Diameter	
11-18-7-33	24	42			Increase Pipe Diameter	
16-127-16-128	24	42			Increase Pipe Diameter	
11-19-11-18	24	42			Increase Pipe Diameter	
17-87-17-88	24	36			Increase Pipe Diameter	
17-48-17-59	24	36			Increase Pipe Diameter	
17-88-17-89	24	36			Increase Pipe Diameter	
17-47-17-48	24	36			Increase Pipe Diameter	
17-59-17-60	24	36			Increase Pipe Diameter	
17-61-17-84	24	36			Increase Pipe Diameter	
17-60-17-61	24	36			Increase Pipe Diameter	
17-85-17-86	24	36			Increase Pipe Diameter	
17-84-17-85	24	36			Increase Pipe Diameter	
17-86-17-87	24	36			Increase Pipe Diameter	
16-132-16-133	24	36			Increase Pipe Diameter	
16-128-16-129	24	36			Increase Pipe Diameter	
12-268-12-278	24	36			Increase Pipe Diameter	
16-135-16-136	24	36			Increase Pipe Diameter	
16-136-16-137	24	36			Increase Pipe Diameter	
16-129-16-130	24	36			Increase Pipe Diameter	
16-131-16-132	24	36			Increase Pipe Diameter	
15-7-15-5A	24	36			Increase Pipe Diameter	
15-13-15-13A	24	36			Increase Pipe Diameter	
12-267-12-268	24	36			Increase Pipe Diameter	
15-11-15-10	24	36			Increase Pipe Diameter	
15-8-15-7	24	36			Increase Pipe Diameter	
16-135A-16-135	24	36			Increase Pipe Diameter	
12-265-12-267	24	36			Increase Pipe Diameter	
16-133-16-134	24	36			Increase Pipe Diameter	
15-3-15-2A	24	36			Increase Pipe Diameter	
15-11A-15-11	24	36			Increase Pipe Diameter	
11-25-11-24	24	36			Increase Pipe Diameter	
15-5A-15-4A	24	36			Increase Pipe Diameter	
15-4A-15-4	24	36			Increase Pipe Diameter	
15-10-15-9	24	36			Increase Pipe Diameter	
11-28A-11-27	24	36			Increase Pipe Diameter	
8-265-8-266	15	21			Increase Pipe Diameter	
8-280-8-281	15	21			Increase Pipe Diameter	
8-281-8-282	15	21			Increase Pipe Diameter	
8-278-8-279	15	21			Increase Pipe Diameter	
8-275-8-278	15	21			Increase Pipe Diameter	
8-266-8-275	15	21			Increase Pipe Diameter	
8-279-8-280	15	21			Increase Pipe Diameter	
7-84-7-85	15	18			Increase Pipe Diameter	
14-62-14-63	12	18			Increase Pipe Diameter	
14-64-17-14	12	18			Increase Pipe Diameter	
17-9-17-10	12	18			Increase Pipe Diameter	
17-11-17-17	12	18			Increase Pipe Diameter	
17-14-17-9	12	18			Increase Pipe Diameter	
17-10-17-11	12	18			Increase Pipe Diameter	
14-63-14-64	12	18			Increase Pipe Diameter	
7-40-7-48	12	18			Increase Pipe Diameter	
7-41-7-40	12	18			Increase Pipe Diameter	
14-53-14-55	12	18			Increase Pipe Diameter	
14-56-14-62	12	18			Increase Pipe Diameter	
7-48-7-47	12	18			Increase Pipe Diameter	
7-47-7-50	12	18			Increase Pipe Diameter	
12-105T-12-105U	8	18			Increase Pipe Diameter	
12-105D-12-105E	8	18			Increase Pipe Diameter	
12-105E-12-105F	8	18			Increase Pipe Diameter	
12-105F-12-105T	8	18			Increase Pipe Diameter	

Table F.5 (similar to Table B.1) Over Capacity						
		Expected Year of Improvement			Improvements Needed	CIP No.
		Anticipated 2013 - 2019	Anticipated 2019 - 2033	Anticipated 2033 - Buildout		
12-105U-11-28B	8	18			Increase Pipe Diameter	
14-50-14-50C	12	15			Increase Pipe Diameter	
14-25-14-41	10	15			Increase Pipe Diameter	
8-35-8-36	10	15			Increase Pipe Diameter	
9-202-9-20	10	15			Increase Pipe Diameter	
9-2-9-1A	10	15			Increase Pipe Diameter	
9-193-9-196	10	15			Increase Pipe Diameter	
9-19-9-18	10	15			Increase Pipe Diameter	
9-201-9-202	10	15			Increase Pipe Diameter	
9-196-9-196A	10	15			Increase Pipe Diameter	
9-16-9-15	10	15			Increase Pipe Diameter	
9-17-9-16	10	15			Increase Pipe Diameter	
9-18-9-17	10	15			Increase Pipe Diameter	
9-200-9-201	10	15			Increase Pipe Diameter	
9-199-9-200	10	15			Increase Pipe Diameter	
9-198-9-199	10	15			Increase Pipe Diameter	
9-197-9-198	10	15			Increase Pipe Diameter	
9-196A-9-197	10	15			Increase Pipe Diameter	
9-20-9-19	10	15			Increase Pipe Diameter	
9-15-9-14	10	15			Increase Pipe Diameter	
8-33-8-34	10	15			Increase Pipe Diameter	
8-34-8-35	10	15			Increase Pipe Diameter	
14-48-14-50	10	15			Increase Pipe Diameter	
9-224-9-202	8	15			Increase Pipe Diameter	
14-26-14-25	8	15			Increase Pipe Diameter	
8-41-8-42	8	15			Increase Pipe Diameter	
4-94-4-93	10	12			Increase Pipe Diameter	
4-91-4-90	10	12			Increase Pipe Diameter	
4-161-4-95	10	12			Increase Pipe Diameter	
4-162-4-161	10	12			Increase Pipe Diameter	
4-163-4-162	10	12			Increase Pipe Diameter	
4-173-4-163	10	12			Increase Pipe Diameter	
9-189-9-190	10	12			Increase Pipe Diameter	
4-92-4-91	10	12			Increase Pipe Diameter	
14-48A-14-48	10	12			Increase Pipe Diameter	
4-93-4-92	10	12			Increase Pipe Diameter	
4-83-4-82	10	12			Increase Pipe Diameter	
4-89-4-86	10	12			Increase Pipe Diameter	
4-84-4-83	10	12			Increase Pipe Diameter	
4-81-4-80	10	12			Increase Pipe Diameter	
8-243-8-242	10	12			Increase Pipe Diameter	
8-50-8-52	10	12			Increase Pipe Diameter	
14-40-14-39	8	12			Increase Pipe Diameter	
14-34-14-33	8	12			Increase Pipe Diameter	
9-188-9-189	8	12			Increase Pipe Diameter	
14-30-14-27	8	12			Increase Pipe Diameter	
14-31-14-30	8	12			Increase Pipe Diameter	
8-4-8-5	8	12			Increase Pipe Diameter	
8-2A-8-3	8	12			Increase Pipe Diameter	
12-105I-12-105H	8	12			Increase Pipe Diameter	
8-2-8-2A	8	12			Increase Pipe Diameter	
12-73-12-75	8	12			Increase Pipe Diameter	
8-51-8-50	8	12			Increase Pipe Diameter	
16-125-16-127	30	42			Increase Pipe Diameter	
16-124-16-125	30	42			Increase Pipe Diameter	
16-123-16-124	30	42			Increase Pipe Diameter	
7-33-7-32	30	42			Increase Pipe Diameter	
11-21-11-20	24	42			Increase Pipe Diameter	
16-134-16-135A	24	36			Increase Pipe Diameter	
16-130A-16-131	24	36			Increase Pipe Diameter	
16-130-16-130A	24	36			Increase Pipe Diameter	
16-137-15-13	24	36			Increase Pipe Diameter	
15-13A-15-12	24	36			Increase Pipe Diameter	
15-2-15-2B	24	36			Increase Pipe Diameter	

Table F.5 (similar to Table B.1) Over Capacity						
		Expected Year of Improvement			Improvements Needed	CIP No.
		Anticipated 2013 - 2019	Anticipated 2019 - 2033	Anticipated 2033 - Buildout		
15-2B-12-265	24	36			Increase Pipe Diameter	
15-4-15-3	24	36			Increase Pipe Diameter	
12-295A-12-295B	24	36			Increase Pipe Diameter	
7-52-7-51	12	18			Increase Pipe Diameter	
17-82-17-83	10	18			Increase Pipe Diameter	
9-193A-9-193	10	15			Increase Pipe Diameter	
14-METER3-14-47	10	15			Increase Pipe Diameter	
9-14-9-13	10	15			Increase Pipe Diameter	
9-10-9-9	10	15			Increase Pipe Diameter	
9-9-13-63F	10	15			Increase Pipe Diameter	
9-11-9-10	10	15			Increase Pipe Diameter	
9-12-9-11	10	15			Increase Pipe Diameter	
9-13-9-12	10	15			Increase Pipe Diameter	
9-1A-8-33	10	15			Increase Pipe Diameter	
8-42-8-43	8	15			Increase Pipe Diameter	
4-80-4-78	10	12			Increase Pipe Diameter	
8-244-8-243	10	12			Increase Pipe Diameter	
17-78-17-82	8	12			Increase Pipe Diameter	
17-89-17-90	24	36			Increase Pipe Diameter	
15-12-15-11A	24	36			Increase Pipe Diameter	
9-190-9-193A	10	12			Increase Pipe Diameter	
17-81-17-82	8	12			Increase Pipe Diameter	
17-80-17-81	8	12			Increase Pipe Diameter	
7-32C-7-32D	36		42		Increase Pipe Diameter	
7-32-7-32A	24		42		Increase Pipe Diameter	
16-METER2-16-12	30		36		Increase Pipe Diameter	
16-119-16-METER	30		36		Increase Pipe Diameter	
16-122-16-123	30		36		Increase Pipe Diameter	
16-121-16-122	30		36		Increase Pipe Diameter	
16-120-16-121	30		36		Increase Pipe Diameter	
16-117-16-118	30		36		Increase Pipe Diameter	
15-2A-15-2	24		36		Increase Pipe Diameter	
11-24A-11-23	24		36		Increase Pipe Diameter	
11-23-11-21	24		36		Increase Pipe Diameter	
11-27-11-26	24		36		Increase Pipe Diameter	
17-93-17-90	24		30		Increase Pipe Diameter	
8-249-8-265	15		21		Increase Pipe Diameter	
12-294A-12-295	8		18		Increase Pipe Diameter	
11-28B-11-28	8		18		Increase Pipe Diameter	
14-50C-14-50D	12		15		Increase Pipe Diameter	
14-52A-14-53	12		15		Increase Pipe Diameter	
14-50E-14-51	12		15		Increase Pipe Diameter	
14-50D-14-50E	12		15		Increase Pipe Diameter	
14-52-14-52A	12		15		Increase Pipe Diameter	
14-46-14-METER3	10		15		Increase Pipe Diameter	
14-47-14-48	10		15		Increase Pipe Diameter	
8-40-8-41	10		15		Increase Pipe Diameter	
8-39-8-40	10		15		Increase Pipe Diameter	
8-36-8-37	10		15		Increase Pipe Diameter	
8-37-8-39	10		15		Increase Pipe Diameter	
4-173A-4-173	10		12		Increase Pipe Diameter	
4-78-8-244	10		12		Increase Pipe Diameter	
4-82-4-81	10		12		Increase Pipe Diameter	
8-21A-8-51	10		12		Increase Pipe Diameter	
8-52-8-59	10		12		Increase Pipe Diameter	
16-83-17-69	8		12		Increase Pipe Diameter	
14-7A-14-7	8		12		Increase Pipe Diameter	
4-100-4-100A	8		12		Increase Pipe Diameter	
17-69-17-73	8		12		Increase Pipe Diameter	
8-3-8-4	8		12		Increase Pipe Diameter	
17-75-17-78	8		12		Increase Pipe Diameter	
14-27-14-26	8		12		Increase Pipe Diameter	
17-74-17-75	8		12		Increase Pipe Diameter	
12-75-8-14	8		12		Increase Pipe Diameter	

Table F.5 (similar to Table B.1) Over Capacity						
		Expected Year of Improvement			Improvements Needed	CIP No.
		Anticipated 2013 - 2019	Anticipated 2019 - 2033	Anticipated 2033 - Buildout		
16-118-16-119	30		36		Increase Pipe Diameter	
11-25A-11-25	30		36		Increase Pipe Diameter	
11-26-11-25A	24		36		Increase Pipe Diameter	
17-90-SHORELINE	24		36		Increase Pipe Diameter	
17-92-17-93	24		30		Increase Pipe Diameter	
17-46-17-47	24			36	Increase Pipe Diameter	
15-9-15-8	24			36	Increase Pipe Diameter	
12-277-12-298	24			36	Increase Pipe Diameter	
11-24-11-24A	24			36	Increase Pipe Diameter	
12-298-12-297	24			36	Increase Pipe Diameter	
12-278-12-277	24			36	Increase Pipe Diameter	
12-295-12-295A	24			36	Increase Pipe Diameter	
12-297-12-295	24			36	Increase Pipe Diameter	
12-295B-11-28	24			36	Increase Pipe Diameter	
11-24B-11-24A	8			24	Increase Pipe Diameter	
14-62B-14-63A	15			18	Increase Pipe Diameter	
14-63B-14-64A	15			18	Increase Pipe Diameter	
14-63A-14-63B	15			18	Increase Pipe Diameter	
14-64A-17-15	15			18	Increase Pipe Diameter	
8-57-7-41	12			18	Increase Pipe Diameter	
14-55-14-56	12			18	Increase Pipe Diameter	
7-50-7-52	12			18	Increase Pipe Diameter	
17-83-17-84	10			18	Increase Pipe Diameter	
14-41-14-42	10			15	Increase Pipe Diameter	
14-42-14-46	10			15	Increase Pipe Diameter	
13-63F-9-7	10			15	Increase Pipe Diameter	
4-174-4-173A	10			12	Increase Pipe Diameter	
4-85-4-84	10			12	Increase Pipe Diameter	
4-86-4-85	10			12	Increase Pipe Diameter	
4-90-4-89	10			12	Increase Pipe Diameter	
8-13-8-21A	10			12	Increase Pipe Diameter	
14-38-14-37	8			12	Increase Pipe Diameter	
13-3-14-48B	8			12	Increase Pipe Diameter	
14-35-14-34	8			12	Increase Pipe Diameter	
17-73-17-74	8			12	Increase Pipe Diameter	
8-56-7-41	24			18	Increase Pipe Diameter	
9-7-9-2	10			15	Increase Pipe Diameter	

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
		SUM of Reach	8-58-8-57				0	176	30	0	0		206
		SUM of Reach	8-50-8-52		Increase 10" to 12"	F.5	0	34	15	8	10		67
		SUM of Reach	17-61-17-84	484	Increase 24" to 36"	F.5	0	28	0	0	10	20	58
		SUM of Reach	8-77-8-76				0	44	5	0	0		49
		SUM of Reach	7-79-7-80				0	30	15	0	0		45
		SUM of Reach	8-68-8-68A				0	31	8	0	0		39
		SUM of Reach	11-8-11-7				0	12	26	0	0		38
		SUM of Reach	8-75-8-57				0	0	38	0	0		38
		SUM of Reach	8-265-8-266	438	Increase 15" to 21"	F.5	0	6	0	0	10	20	36
	Metro	SUM of Reach	17-47-17-48	500	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10	20	34
	Metro	SUM of Reach	17-48-17-59	506	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10	20	34
	Metro	SUM of Reach	17-60-17-61	179	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10	20	34
	Metro	SUM of Reach	17-84-17-85	457	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10	20	34
	Metro	SUM of Reach	17-85-17-86	111	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10	20	34
	Metro	SUM of Reach	17-86-17-87	43	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10	20	34
	Metro	SUM of Reach	17-87-17-88	35	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10	20	34
		SUM of Reach	9-224-9-202		Increase 8" to 15"	F.5	10	4	10	0	10		34
		SUM of Reach	8-76-8-75				0	29	5	0	0		34
		SUM of Reach	8-244-8-243	305	Increase 10" to 12"	F.5	0	3	0	0	10	20	33
		Capacity - Model	17-59-17-60	463	Increase 24" to 36"	F.5					10	20	30
		SUM of Reach	12-143-12-142				0	5	25	0	0		30
		SUM of Reach	12-84A-12-83				0	10	5	14	0		29
		SUM of Reach	13-53-9-212				0	4	25	0	0		29
		SUM of Reach	7-9-7-10				0	15	14	0	0		29
		SUM of Reach	12-75-8-14				0	0	0	28	0		28
		SUM of Reach	5-260-5-344				0	23	5	0	0		28
		SUM of Reach	7-78-7-79				0	28	0	0	0		28
		SUM of Reach	5-261-5-260				0	22	5	0	0		27
		SUM of Reach	12-133-12-134				0	16	0	10	0		26
		SUM of Reach	14-66-14-65				0	16	10	0	0		26
		SUM of Reach	8-136-8-137				0	14	12	0	0		26
		SUM of Reach	12-109-12-110				0	5	20	0	0		25
		SUM of Reach	5-267-5-261				0	25	0	0	0		25
		SUM of Reach	8-332-8-331				0	5	20	0	0		25
		SUM of Reach	8-249-8-265	98			0	1	3	0	0	20	24
		SUM of Reach	8-3-8-4				0	24	0	0	0		24
		SUM of Reach	14-34-14-33		Increase 10" to 12"	F.5	0	13	0	0	10		23
		SUM of Reach	8-52-8-59				0	23	0	0	0		23
		SUM of Reach	8-4-8-5		Increase 8" to 12"	F.5	0	12	0	0	10		22
		SUM of Reach	13-21A-13-21				0	19	3	0	0		22
		SUM of Reach	8-107-8-106				0	6	10	6	0		22
		SUM of Reach	8-59A-8-59				0	13	9	0	0		22
		SUM of Reach	8-78-8-77				0	15	3	4	0		22
	Lift Station 1	Roots	8-246-8-247	180		F.1	0	1	0	0	0	20	21
		SUM of Reach	12-101-12-95				0	2	5	14	0		21
	Edmonds WWTP	SUM of Reach	16-128-16-129	0	Increase 24" to 36"	F.3	0	0	0	10	10		20
	Edmonds WWTP	SUM of Reach	12-73-12-75		Increase 8 to 12"	F.3 and F.5	0	0	0	10	10		20
	Edmonds WWTP	SUM of Reach	16-133-16-134	0	Increase 24" to 36"	F.3 and F.5	0	0	0	10	10		20
		SUM of Reach	8-243-8-242		Increase 10" to 12"	F.5	0	0	10	0	10		20
		SUM of Reach	8-280-8-281		Increase 15" to 21"	F.5	0	0	10	0	10		20
		SUM of Reach	1-55-1-52				0	0	0	20	0		20
		SUM of Reach	7-37-7-36				0	15	5	0	0		20

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
		Observed Surcharge	8-242-8-245	78								20	20
		Observed Surcharge	8-245-8-246	173								20	20
		Observed Surcharge	8-247-8-248	71								20	20
		Observed Surcharge	8-248-8-249	147								20	20
		SUM of Reach	8-285-8-284				0	5	15	0	0		20
		SUM of Reach	9-363A-9-363				0	8	12	0	0		20
		SUM of Reach	8-51-8-50		Increase 10" to 12"	F.5	0	4	5	0	10		19
		SUM of Reach	4-60-4-62				0	19	0	0	0		19
		SUM of Reach	7-34-7-30				0	14	5	0	0		19
		SUM of Reach	8-135-8-316				5	9	5	0	0		19
		SUM of Reach	8-68B-8-68				0	2	17	0	0		19
		SUM of Reach	8-UNK 1-8-330A				0	19	0	0	0		19
		SUM of Reach	9-299-9-298				0	6	3	10	0		19
		SUM of Reach	10-27-10-28				0	18	0	0	0		18
		SUM of Reach	12-49-12-50				0	0	8	10	0		18
		SUM of Reach	13-22-13-22A				0	0	18	0	0		18
		SUM of Reach	8-182-8-179				0	18	0	0	0		18
		SUM of Reach	9-20-9-19		Increase 10" to 15"		0	8	0	0	10		18
		SUM of Reach	12N-79-13-65B				0	0	3	14	0		17
		SUM of Reach	8-73-8-74				0	17	0	0	0		17
		SUM of Reach	8-281-8-282		Increase 15" to 21"	F.5	0	1	5	0	10		16
		SUM of Reach	9-11-9-10		Increase 10" to 15"	F.5	0	6	0	0	10		16
		SUM of Reach	12-134-12-132				0	2	14	0	0		16
		SUM of Reach	12-1-8-1				0	16	0	0	0		16
		SUM of Reach	13-4-14-49				0	16	0	0	0		16
		SUM of Reach	14-67-14-66				0	16	0	0	0		16
		SUM of Reach	17-23-17-39				0	16	0	0	0		16
		SUM of Reach	7-46-7-47				0	11	5	0	0		16
		SUM of Reach	8-21A-8-51				0	16	0	0	0		16
	Edmonds WWTP	SUM of Reach	8-35-8-36	N/A	Increase 10" to 15"	F.1 and F.5	0	5	0	0	10		15
	Metro	SUM of Reach	17-78-17-82	0	Longitudinal - Wider (8" - 12")	F.2 and F.5	0	0	5	0	10		15
		SUM of Reach	14-56-14-62		Increase 12" to 18"	F.5	0	2	3	0	10		15
		SUM of Reach	12-126-12-125				0	0	15	0	0		15
		SUM of Reach	1-36A-1-36				0	5	0	10	0		15
		SUM of Reach	7-43-7-40				0	15	0	0	0		15
		SUM of Reach	7-61-7-60				0	15	0	0	0		15
		SUM of Reach	7-81-7-82				0	15	0	0	0		15
		SUM of Reach	8-112-8-117				0	10	5	0	0		15
		SUM of Reach	8-114-8-113				0	5	0	10	0		15
		SUM of Reach	8-178-8-177A				0	15	0	0	0		15
		SUM of Reach	8-240-8-239				0	5	10	0	0		15
		SUM of Reach	8-31-8-30				0	15	0	0	0		15
		SUM of Reach	8-59-8-58				0	5	10	0	0		15
	Metro	SUM of Reach	14-48-14-50	0	Increase 10" to 15"	F.1 and F.5	0	4	0	0	10		14
	Metro	SUM of Reach	17-88-17-89	0	Increase 24" to 36"	F.1 and F.5	0	4	0	0	10		14
	Edmonds WWTP	SUM of Reach	7-47-7-50	0	Increase 12" to 18"	F.1 and F.5	0	4	0	0	10		14
	Edmonds WWTP	SUM of Reach	7-48-7-47	0	Increase 12" to 18"	F.1 and F.5	0	4	0	0	10		14
	Edmonds WWTP	SUM of Reach	8-34-8-35	0	Increase 10" to 15"	F.1 and F.5	0	4	0	0	10		14
	Edmonds WWTP	SUM of Reach	9-193-9-196		Increase 10" to 15"	F.1 and F.5	0	4	0	0	10		14
	Edmonds WWTP	SUM of Reach	9-19-9-18		Increase 10" to 15"	F.1 and F.5	0	4	0	0	10		14
	Edmonds WWTP	SUM of Reach	9-201-9-202		Increase 10" to 15"	F.1 and F.5	0	4	0	0	10		14
	Edmonds WWTP	SUM of Reach	9-202-9-20		Increase 10" to 15"	F.1 and F.5	0	4	0	0	10		14

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
		SUM of Reach	4-163-4-162		Increase 10" to 12"	F.5	0	4	0	0	10		14
		SUM of Reach	9-188-9-189		Increase 8" to 12"	F.5	0	4	0	0	10		14
		SUM of Reach	11-6-11-5				0	6	8	0	0		14
		SUM of Reach	12-132-12-131				0	0	14	0	0		14
		SUM of Reach	14-65-14-64				0	4	0	10	0		14
		SUM of Reach	2-29-2-28				0	5	5	4	0		14
		SUM of Reach	3-66E-3-66D				0	8	3	3	0		14
		SUM of Reach	4-78-8-244				0	14	0	0	0		14
		SUM of Reach	5-334B-5-334A				0	14	0	0	0		14
		SUM of Reach	7-35-7-33B				0	5	5	4	0		14
		SUM of Reach	7-50-7-52				0	4	10	0	0		14
		SUM of Reach	7-66-8-327				0	14	0	0	0		14
		SUM of Reach	7-83-7-84				0	14	0	0	0		14
		SUM of Reach	8-269-8-267				0	14	0	0	0		14
		SUM of Reach	8-54-8-56				0	14	0	0	0		14
		SUM of Reach	8-71-8-72				0	5	9	0	0		14
		SUM of Reach	8-41-8-42		Increase 8" to 15"	F.5	0	3	0	0	10		13
		SUM of Reach	10-6-10-5				0	5	8	0	0		13
		SUM of Reach	12-248-12-247				0	0	13	0	0		13
		SUM of Reach	14-29-14-28				0	5	8	0	0		13
		SUM of Reach	8-18-8-55				0	13	0	0	0		13
		SUM of Reach	9-262A-9-262				0	8	5	0	0		13
		SUM of Reach	8-2-8-2A		Increase 8" to 12"	F.5	0	2	0	0	10		12
		SUM of Reach	8-2A-8-3		Increase 8" to 12"	F.5	0	2	0	0	10		12
		SUM of Reach	11-9A-7-35				0	12	0	0	0		12
		SUM of Reach	14-3-14-3A				0	0	9	3	0		12
		SUM of Reach	2-113A-2-113				0	1	11	0	0		12
		SUM of Reach	8-60-8-59A				0	12	0	0	0		12
		SUM of Reach	8-87-8-86				0	12	0	0	0		12
		SUM of Reach	9-150-5-336				0	7	5	0	0		12
	Edmonds WWTP	SUM of Reach	11-19-11-18	0	Increase from 24 to 42	F.5	0	1	0	0	10		11
		SUM of Reach	12-54-12-53				0	11	0	0	0		11
		SUM of Reach	12-95-12-94				0	6	5	0	0		11
		SUM of Reach	3-12F-3-12E				0	1	0	10	0		11
		SUM of Reach	5-42-5-41				0	8	0	3	0		11
		SUM of Reach	8-203-8-202				0	7	0	4	0		11
		SUM of Reach	8-72-8-73				0	6	5	0	0		11
		SUM of Reach	8-97-8-98				0	1	10	0	0		11
		SUM of Reach	9-109-8-193				0	11	0	0	0		11
	Lift Station 1	SUM of Reach	4-83-4-82	N/A	Increase 10" to 12"	F.1 and F.5	0	0	0	0	10		10
	Edmonds WWTP	SUM of Reach	7-33-7-32		Increase 30" to 42"	F.1 and F.5	0	0	0	0	10		10
	Edmonds WWTP	Hole in Pipe - Large	12-105M-12-105K	1		F.3	0	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-181-12-182	0		F.3	0	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-42-12-43	0		F.3	0	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-57-12-58	0		F.3	0	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-71-12-73	0		F.3	0	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	13-65A-12-7	0		F.3	0	0	0	10	0		10
	Metro	Pipe Repair	14-73-14-72	0		F.3	0	0	0	10	0		10
	Metro	Pipe Repair	16-27-16-31	0		F.3	0	0	0	10	0		10
	Lift Station 12	Pipe Repair	1-79-1-78	8		F.3	0	0	0	10	0		10
	Lift Station 4	Hole in Pipe - Large	2-64B-2-68	0		F.3	0	0	0	10	0		10
	Lynnwood WWTP	Pipe Repair	3-65-3-66A	0		F.3	0	0	0	10	0		10

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Edmonds WWTP	Pipe Repair	7-39B-7-39C	0		F.3	0	0	0	10	0		10
	Storm Lines	Pipe Repair	8-322	0		F.3	0	0	0	10	0		10
	Edmonds WWTP	Capacity - Model	11-18-7-33	N/A	Increase from 24 to 42	F.5	0	0	0	0	10		10
		Capacity - Model	11-20-11-19		Increase from 24 to 42	F.5					10		10
		Capacity - Model	11-21-11-20		Increase from 24 to 42	F.5					10		10
		Capacity - Model	11-25-11-24		Increase from 24 to 36	F.5					10		10
		Capacity - Model	11-28A-11-27		Increase from 24 to 36	F.5					10		10
		Capacity - Model	12-105D-12-105E		Increase from 8 to 18	F.5					10		10
		Capacity - Model	12-105E-12-105F		Increase from 8 to 18	F.5					10		10
		Capacity - Model	12-105F-12-105T		Increase from 8 to 18	F.5					10		10
		Capacity - Model	12-105I-12-105H		Increase from 8 to 12	F.5					10		10
		Capacity - Model	12-105T-12-105U		Increase from 8 to 18	F.5					10		10
		Capacity - Model	12-105U-11-28B		Increase from 8 to 18	F.5					10		10
		Capacity - Model	12-265-12-267		Increase 24 to 36	F.5					10		10
		Capacity - Model	12-267-12-268		Increase 24 to 36	F.5					10		10
		Capacity - Model	12-268-12-278		Increase 24 to 36	F.5					10		10
		Capacity - Model	12-295A-12-295B		Increase 24 to 36	F.5					10		10
		Capacity - Model	14-25-14-41		Increase 10" to 15"	F.5					10		10
		Capacity - Model	14-26-14-25		Increase 8 " to 15"	F.5					10		10
		Capacity - Model	14-30-14-27		Increase 10" to 12"	F.5					10		10
		Capacity - Model	14-31-14-30		Increase 10" to 12"	F.5					10		10
		Capacity - Model	14-40-14-39		Increase 8 " to 12"	F.5					10		10
		Capacity - Model	14-48A-14-48		Increase 10" to 12"	F.5					10		10
		Capacity - Model	14-50-14-50C		Increase 12" to 18"	F.5					10		10
		Capacity - Model	14-53-14-55		Increase 12" to 15"	F.5					10		10
		Capacity - Model	14-62-14-63		Increase 12" to 18"	F.5					10		10
		Capacity - Model	14-63-14-64		Increase 12" to 18"	F.5					10		10
		Capacity - Model	14-64-17-14		Increase 12" to 18"	F.5					10		10
		Capacity - Model	14-METER3-14-47		Increase 10" to 15"	F.5	0	0	0	0	10		10
		Capacity - Model	15-10-15-9		Increase 24" to 36"	F.5	0	0	0	0	10		10
		Capacity - Model	15-11-15-10		Increase 24" to 36"	F.5	0	0	0	0	10		10
		Capacity - Model	15-11A-15-11		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-12-15-11A		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-13-15-13A		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-13A-15-12		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-2-15-2B		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-2B-12-265		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-3-15-2A		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-4-15-3		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-4A-15-4		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-5A-15-4A		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-7-15-5A		Increase 24" to 36"	F.5					10		10
		Capacity - Model	15-8-15-7		Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-123-16-124		Increase 30" to 42"	F.5					10		10
		Capacity - Model	16-124-16-125		Increase 30" to 42"	F.5					10		10
		Capacity - Model	16-125-16-127		Increase 30" to 42"	F.5					10		10
		Capacity - Model	16-127-16-128		Increase 24" to 42"	F.5					10		10
		Capacity - Model	16-129-16-130		Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-130-16-130A		Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-130A-16-131		Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-131-16-132		Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-132-16-133		Increase 24" to 36"	F.5					10		10

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
		Capacity - Model	16-134-16-135A	24	Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-135-16-136	24	Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-135A-16-135	24	Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-136-16-137	24	Increase 24" to 36"	F.5					10		10
		Capacity - Model	16-137-15-13	24	Increase 24" to 36"	F.5					10		10
		Capacity - Model	17-10-17-11		Increase 12" to 18"	F.5					10		10
		Capacity - Model	17-11-17-17		Increase 12" to 18"	F.5					10		10
		Capacity - Model	17-14-17-9		Increase 12" to 18"	F.5					10		10
		Capacity - Model	17-80-17-81		Increase 8" to 12"	F.5					10		10
		Capacity - Model	17-81-17-82		Increase 8" to 12"	F.5					10		10
		Capacity - Model	17-82-17-83		Increase 10" to 18"	F.5					10		10
		Capacity - Model	17-89-17-90		Increase 24" to 36"	F.5					10		10
		Capacity - Model	17-9-17-10		Increase 12" to 18"	F.5					10		10
		Capacity - Model	4-161-4-95		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-162-4-161		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-173-4-163		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-80-4-78		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-81-4-80		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-84-4-83		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-89-4-86		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-91-4-90		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-92-4-91		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-93-4-92		Increase 10" to 12"	F.5					10		10
		Capacity - Model	4-94-4-93		Increase 10" to 12"	F.5					10		10
		Capacity - Model	7-32D-ED-WWTP		Increase 36" to 42"	F.5	0				10		10
		Capacity - Model	7-40-7-48		Increase 12" to 18"	F.5					10		10
		Capacity - Model	7-41-7-40		Increase 12" to 18"	F.5					10		10
		Capacity - Model	7-52-7-51		Increase 12" to 18"	F.5					10		10
		Capacity - Model	7-84-7-85		Increase 15" to 18"	F.5					10		10
		Capacity - Model	8-266-8-275		Increase 15" to 21"	F.5					10		10
		Capacity - Model	8-275-8-278		Increase 15" to 21"	F.5					10		10
		Capacity - Model	8-278-8-279		Increase 15" to 21"	F.5					10		10
		Capacity - Model	8-279-8-280		Increase 15" to 21"	F.5					10		10
		Capacity - Model	8-33-8-34		Increase 10" to 15"	F.5					10		10
		Capacity - Model	8-42-8-43		Increase 8" to 15"	F.5					10		10
		Capacity - Model	9-10-9-9		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-12-9-11	10	Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-13-9-12	10	Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-14-9-13	10	Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-15-9-14		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-16-9-15		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-17-9-16		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-18-9-17		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-189-9-190		Increase 10" to 12"	F.5					10		10
		Capacity - Model	9-190-9-193A		Increase 10" to 12"	F.5					10		10
		Capacity - Model	9-193A-9-193		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-196-9-196A		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-196A-9-197		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-197-9-198		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-198-9-199		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-199-9-200		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-1A-8-33		Increase 10" to 15"	F.5					10		10

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
		Capacity - Model	9-200-9-201		Increase 10" to 15"	F.5					10		10
		Capacity -Model	9-2-9-1A		Increase 10" to 15"	F.5					10		10
		Capacity - Model	9-9-13-63F		Increase 10" to 15"	F.5	0	0	0	0	10		10
		SUM of Reach	12-106-12-107				0	0	10	0	0		10
		SUM of Reach	12-107-12-108				0	0	10	0	0		10
		SUM of Reach	12-121-12-119				0	10	0	0	0		10
		SUM of Reach	12-123-12-121				0	10	0	0	0		10
		SUM of Reach	12-128-12-127				0	0	10	0	0		10
		SUM of Reach	12-13-12-14				0	10	0	0	0		10
		SUM of Reach	12-139-12-138				0	5	5	0	0		10
		SUM of Reach	12-14-12-15				0	10	0	0	0		10
		SUM of Reach	12-156-12-155				0	10	0	0	0		10
		SUM of Reach	12-16-12-17				0	5	5	0	0		10
		SUM of Reach	12-185D-12-130				0	0	10	0	0		10
		SUM of Reach	12-87-12-86				0	10	0	0	0		10
		SUM of Reach	12-93-12-90				0	0	10	0	0		10
		SUM of Reach	13-166A-13-166				0	10	0	0	0		10
		SUM of Reach	13-81A-13-81B				0	10	0	0	0		10
		SUM of Reach	14-7L-14-7B				0	10	0	0	0		10
		SUM of Reach	2-91-2-90				0	5	5	0	0		10
		SUM of Reach	5-156-5-151				0	10	0	0	0		10
		SUM of Reach	7-56-7-55				0	10	0	0	0		10
		SUM of Reach	7-65-7-66				0	5	5	0	0		10
		SUM of Reach	7-76-7-75				0	0	10	0	0		10
		SUM of Reach	7-77-7-76				0	0	10	0	0		10
		SUM of Reach	8-101A-8-100				0	5	5	0	0		10
		SUM of Reach	8-167-8-165				0	10	0	0	0		10
		SUM of Reach	8-257-8-257A				0	10	0	0	0		10
		SUM of Reach	8-287-8-286				0	0	10	0	0		10
		SUM of Reach	8-291A-8-291				0	10	0	0	0		10
		SUM of Reach	8-298-8-297				0	10	0	0	0		10
		SUM of Reach	8-303B-8-303D				0	0	10	0	0		10
		SUM of Reach	8-329A-8-329				0	10	0	0	0		10
		SUM of Reach	8-5-8-6				0	10	0	0	0		10
		SUM of Reach	8-98-8-99				0	0	10	0	0		10
		SUM of Reach	9-225-9-224				0	2	8	0	0		10
	Metro	Hole in Pipe - Medium	10-3-10-4	0	MEDIUM	F.2	0	0	9	0	0		9
	Lift Station 12	Hole in Pipe - Medium	1-16-1-20	0	MEDIUM	F.2	0	0	9	0	0		9
	Lift Station 1	Hole in Pipe - Medium	8-245A-8-245	0	MEDIUM	F.2	0	0	9	0	0		9
	Edmonds WWTP	Hole in Pipe - Medium	9-301-9-300	0	MEDIUM	F.2	0	0	9	0	0		9
		SUM of Reach	11-23A-11-21				0	5	0	4	0		9
		SUM of Reach	12-246-12-243				0	6	3	0	0		9
		SUM of Reach	1-31-1-30				0	4	5	0	0		9
		SUM of Reach	14-7-14-7A				5	4	0	0	0		9
		SUM of Reach	7-38-7-36				0	4	5	0	0		9
		SUM of Reach	8-155-8-352				0	9	0	0	0		9
		SUM of Reach	8-178A-8-177A				0	4	5	0	0		9
		SUM of Reach	8-30-8-29				0	4	5	0	0		9
		SUM of Reach	9-347-9-348				0	9	0	0	0		9
		SUM of Reach	9-59-9-60				0	0	5	4	0		9
	Edmonds WWTP	Hole in Pipe - Small	12-200-12-112	0	SMALL	F.2	0	0	8	0	0		8
	Lift Station 4	Hole in Pipe - Small	2-89-2-88	0	SMALL	F.2	0	0	8	0	0		8

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Lift Station 1	Hole in Pipe - Small	4-186-4-185	0	SMALL	F.2	0	0	8	0	0		8
	Lift Station 1	Hole in Pipe - Small	5-269-5-267	0	SMALL	F.2	0	0	8	0	0		8
	Lift Station 1	Hole in Pipe - Small	8-202-8-201	0	SMALL	F.2	0	0	8	0	0		8
	Lift Station 1	Hole in Pipe - Small	9-80A-9-80	0	SMALL	F.2	0	0	8	0	0		8
	Edmonds WWTP	Hole in Pipe - Small	INLET-7-61	0	SMALL	F.2	0	0	8	0	0		8
		SUM of Reach	12-105B-12-105A				0	5	3	0	0		8
		SUM of Reach	12-28-8-2				0	8	0	0	0		8
		SUM of Reach	12-51-8-11				0	0	5	3	0		8
		SUM of Reach	13-157-13-156				0	8	0	0	0		8
		SUM of Reach	13-56-13-57				0	8	0	0	0		8
		SUM of Reach	14-7G-14-7F				0	4	0	4	0		8
		SUM of Reach	3-94-3-93				0	8	0	0	0		8
		SUM of Reach	4-196-4-200				0	5	3	0	0		8
		SUM of Reach	5-122-5-121				0	2	0	6	0		8
		SUM of Reach	5-135-5-134				0	5	3	0	0		8
		SUM of Reach	5-325-5N-11				0	8	0	0	0		8
		SUM of Reach	5-7-5-8				0	8	0	0	0		8
		SUM of Reach	7-49-7-49A				0	5	3	0	0		8
		SUM of Reach	8-197-8-199				0	8	0	0	0		8
		SUM of Reach	8-70-8-71				0	8	0	0	0		8
		SUM of Reach	8-99-8-316				0	8	0	0	0		8
		SUM of Reach	9-175-9-177				0	8	0	0	0		8
		SUM of Reach	9-273A-9-273				0	3	5	0	0		8
		SUM of Reach	9-314-9-366				0	8	0	0	0		8
		SUM of Reach	9-364-9-363				0	8	0	0	0		8
	Lift Station 12	Deformed	1-11-1-15	0		F.3	0	0	0	7	0		7
		SUM of Reach	12-175-12-146				0	7	0	0	0		7
		SUM of Reach	12-72-12-71				0	2	5	0	0		7
		SUM of Reach	16-106-16-110				0	7	0	0	0		7
		SUM of Reach	16-59-16-60				0	7	0	0	0		7
		SUM of Reach	2-112-2-111				0	4	3	0	0		7
		SUM of Reach	4-131-4-100				0	7	0	0	0		7
		SUM of Reach	4-134-4-133				0	7	0	0	0		7
		SUM of Reach	8-17-8-18				0	3	0	4	0		7
		SUM of Reach	8-291-8-283				0	7	0	0	0		7
		SUM of Reach	8-331-8-330				0	2	5	0	0		7
		SUM of Reach	8-43-8-44				0	7	0	0	0		7
		SUM of Reach	8-85K-8-85F				0	1	6	0	0		7
	Lynnwood WWTP	Problem Laterals - Abandoned	5-203-5-201	N/A		F.1	0	6	0	0	0		6
	1048 Walnut Street	Grit (a lot)	8-2A-8-2	205	Conc	F.1	6	0	0	0	0		6
	942 Alder Street	Grit (a lot)	8-30-8-31	275	Conc	F.1	6	0	0	0	0		6
	10th at Alder Street	Grit (a lot)	8-31-8-32	336	Conc	F.1	6	0	0	0	0		6
	Alder St at Yost Park	Grit (a lot)	8-328-8-2	265	Conc	F.1	6	0	0	0	0		6
	1053 Alder Street	Grit (a lot)	8-32A-8-32B	55	Conc	F.1	6	0	0	0	0		6
	10th Ave South at Walnut St	Grit (a lot)	8-4-8-3	335	Conc	F.1	6	0	0	0	0		6
	935 Walnut Street	Grit (a lot)	8-5-8-4	260	Conc	F.1	6	0	0	0	0		6
	8620 Maplewood Lane	Grit (a lot)	9-139-9-137	155	Conc	F.1	6	0	0	0	0		6
		SUM of Reach	12-105N-12-105M				0	0	0	6	0		6
		SUM of Reach	12-135-12-134				0	6	0	0	0		6
		SUM of Reach	12-160-12-149				0	6	0	0	0		6
		SUM of Reach	12-208-12-207				0	6	0	0	0		6
		SUM of Reach	12-226-12-225				0	1	5	0	0		6

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
		SUM of Reach	12-243-12-241				0	3	3	0	0		6
		SUM of Reach	12-287-12-286				0	6	0	0	0		6
		SUM of Reach	12-71-12-89				0	1	5	0	0		6
		SUM of Reach	13-113-13-112				0	0	6	0	0		6
		SUM of Reach	16-37-16-38				0	6	0	0	0		6
		SUM of Reach	16-9-16-8				0	1	5	0	0		6
		SUM of Reach	2-27-2-25				0	6	0	0	0		6
		SUM of Reach	3-131-3-132				0	1	5	0	0		6
		SUM of Reach	4-30-4-28				0	6	0	0	0		6
		SUM of Reach	4-52-4-52A				0	1	5	0	0		6
		SUM of Reach	4-52A-4-53				0	0	0	6	0		6
		SUM of Reach	5-14-5-15				0	6	0	0	0		6
		SUM of Reach	5-299-5-300				0	1	5	0	0		6
		SUM of Reach	5-74-5-72				0	6	0	0	0		6
		SUM of Reach	8-175-8-174				0	0	3	3	0		6
		SUM of Reach	8-2D-8-2B				0	0	6	0	0		6
		SUM of Reach	8-55-8-55A				0	6	0	0	0		6
		SUM of Reach	9-117-9-116				0	1	5	0	0		6
		SUM of Reach	9-262B-9-262A				0	6	0	0	0		6
		SUM of Reach	9-264-9-266				0	1	5	0	0		6
		SUM of Reach	9-273-9-274				0	6	0	0	0		6
		SUM of Reach	9-287-9-286				0	6	0	0	0		6
	7122 210th Street	Grease	10-23-10-25	283	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	11-2-11-7	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	11-7-11-9	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-111-12-68	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-119-12-117	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-124-12-123	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-125-12-123	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-127-12-125	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-129-12-127	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-137-12-136	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-144-12-146	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-147-12-148	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-154-12-153	N/A		F.1	0	5	0	0	0		5
	9223 216th Street	Black Water	12-156-13-96	380	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-17-12-18	N/A		F.1	0	5	0	0	0		5
	1153 8th Ave S.	Grit, Black Water	12-189-12-190 c/o	120	Conc	F.1	5	0	0	0	0		5
PIPE REPAIR	1115 8th Ave S.	Grit, Black Water	12-191-12-189	285	Conc	F.1	5	0	0	0	0		5
	736 Fir Street	Black Water	12-192-12-191	200	Conc	F.1	5	0	0	0	0		5
PIPE REPAIR	Edmonds WWTP	Problem Laterals - Connections	12-209-12-207	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-46-12-46A	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-47-12-49	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-5-12-2	N/A		F.1	0	5	0	0	0		5
BREACH	Edmonds WWTP	Problem Laterals - Connections	12-6-12-5	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-69-12-67	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-90-12-87	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	12-94A-12-94	N/A		F.1	0	5	0	0	0		5
BREACH	Metro	Problem Laterals - Connections	13-146-13-145	N/A		F.1	0	5	0	0	0		5
	16131 75th Place West	Grease	1-36-1-36A	211	PVC	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	13-87-13-88	N/A		F.1	0	5	0	0	0		5
	Lift Station 12	Problem Laterals - Connections	1-39-1-38	N/A		F.1	0	5	0	0	0		5

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Edmonds WWTP	Problem Laterals - Connections	13-99-13-98	N/A		F.1	0	5	0	0	0		5
	21808 Highway 99	Black Water	14-22-14-24	360	Conc	F.1	5	0	0	0	0		5
	21309 76th Ave W (Drop MH)	Grit, Black Water	14-40-9-254	330	Conc	F.1	5	0	0	0	0		5
	Metro	Problem Laterals - Connections	14-47-14-48	N/A		F.1	0	5	0	0	0		5
	215th At 72nd	Black Water	14-6-14-7	260	Conc	F.1	5	0	0	0	0		5
	74th at 228th St	Grease	14-65-14-66	320	Conc	F.1	5	0	0	0	0		5
	Metro	Problem Laterals - Connections	14-70-14-69	N/A		F.1	0	5	0	0	0		5
	72nd Ave W. at 215th St	Black Water	14-7A-14-7B	255	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	15-3C-15-3B	N/A		F.1	0	5	0	0	0		5
	240th at 78th Ave W	Black Water	16-76-16-77	160	Conc	F.1	5	0	0	0	0		5
	240th St and 78th Ave W	Grit, Black Water	16-77-16-65	275	Conc	F.1	5	0	0	0	0		5
	Metro	Problem Laterals - Connections	16-99-16-102	N/A		F.1	0	5	0	0	0		5
	23819 76th Ave W	Black Water	17-72-Main	44	Conc	F.1	5	0	0	0	0		5
	23821 76th Ave	Grease	17-73-17-69	232	Conc	F.1	5	0	0	0	0		5
	76th Ave W. at 242nd St	Black Water	17-81-17-80	360	Conc	F.1	5	0	0	0	0		5
	24122 76th Ave W	Black Water	17-82-17-81	105	Conc	F.1	5	0	0	0	0		5
PROBLEM JOINTS	Lift Station 12	Problem Laterals - Connections	1-9-1-9A	N/A		F.1	0	5	0	0	0		5
	Lift Station 4	Problem Laterals - Connections	2-131-2-132	N/A		F.1	0	5	0	0	0		5
BREACH	Lynnwood WWTP	Problem Laterals - Connections	3-130-3-129	N/A		F.1	0	5	0	0	0		5
	Lynnwood WWTP	Problem Laterals - Connections	3-157-3-156	N/A		F.1	0	5	0	0	0		5
	7117 176th St. SW	Dirt, Grease, Grit	3-93-3-94	150	Conc	F.1	5	0	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	4-119-4-121	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	4-13-4-42	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	4-171-4-173A	N/A		F.1	0	5	0	0	0		5
	Lift Station 3	Problem Laterals - Connections	4-58-4-59	N/A		F.1	0	5	0	0	0		5
	Lift Station 3	Problem Laterals - Connections	4-62-4-63	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	5-113-5-111	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	5-137-5-136	N/A		F.1	0	5	0	0	0		5
	Lynnwood WWTP	Problem Laterals - Connections	5-160-5-159	N/A		F.1	0	5	0	0	0		5
	Dellwood Dr. at 78th Ave W	Black Water	5-191-5-187	200	Conc	F.1	5	0	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	5-240B-5-240A	N/A		F.1	0	5	0	0	0		5
ROOTS	Lift Station 9	Problem Laterals - Connections	5-309-5-304	N/A		F.1	0	5	0	0	0		5
ROOTS	Lynnwood WWTP	Problem Laterals - Connections	5-324-5-324A	N/A		F.1	0	5	0	0	0		5
ROOTS	7601 OVD Post Office	Grit	5-325-5-328	350	Conc	F.1	5	0	0	0	0		5
	18209 76th Ave West	Grit	5-325-5-511-11	80	Conc	F.1	5	0	0	0	0		5
ROOTS	Lift Station 1	Problem Laterals - Connections	5-55-5-54	N/A		F.1	0	5	0	0	0		5
PROBLEM JOINTS	Lift Station 1	Problem Laterals - Connections	5-67-5-66	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	5-81-5-80	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	5-87-5-86	N/A		F.1	0	5	0	0	0		5
	Lift Station 10	Problem Laterals - Connections	5-88G-5-88E	N/A		F.1	0	5	0	0	0		5
	Admiral Way at Dayton	Grease	7-11-7-10	80	Conc	F.1	5	0	0	0	0		5
	Admiral Way	Grease	7-3-7-2	425	Conc	F.1	5	0	0	0	0		5
	Admiral Way	Grease	7-4-7-3	380	Conc	F.1	5	0	0	0	0		5
	Admiral Way	Grease	7-5-7-4	380	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	7-59-7-57	N/A		F.1	0	5	0	0	0		5
	Admiral Way	Grease	7-6-7-5	280	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	7-69-7-70	N/A		F.1	0	5	0	0	0		5
	Admiral Way at West Dayton	Grit	7-6-CO	125	Conc	F.1	5	0	0	0	0		5
	Admiral Way at Dayton	Grease	7-7-7-11	37	Conc	F.1	5	0	0	0	0		5
	Admiral Way	Grease	7-7-7-6	35	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	7-80-7-61	N/A		F.1	0	5	0	0	0		5
Miscellaneous Meters	Lift Station 1	Problem Laterals - Connections	8-150-8-149	N/A		F.1	0	5	0	0	0		5

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
Miscellaneous Meters	Lift Station 1	Problem Laterals - Connections	8-160-8-159	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-163-8-162	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-165-8-164	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-172A-8-172	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-183-8-182	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-255-8-254	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-257A-8-254	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-285-8-284	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	8-28-8-27	N/A		F.1	0	5	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	8-303-8-303A	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	8-32-8-31	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	8-335-8-UNK 1	N/A		F.1	0	5	0	0	0		5
	1033 Walnut Street	Grit	8-3-8-2A	130	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	8-53-8-54	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	8-55A-8-57	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	8-59-8-58	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	8-64-8-63	N/A		F.1	0	5	0	0	0		5
	7th Ave at Edmonds St	Black Water	8-99-8-101A	207	Conc	F.1	5	0	0	0	0		5
	8705 Maplewood Lane	Grit, Black Water	9-137-9-138	340	Conc	F.1	5	0	0	0	0		5
	8610 Main Street	Grit	9-16-9-19	178	Conc	F.1	5	0	0	0	0		5
	8610 Main Street	Black Water	9-19-9-20	56	Conc	F.1	5	0	0	0	0		5
	Pine Ridge Park	Black Water	9-202-9-201+	165	Conc	F.1	5	0	0	0	0		5
	Bpind Ridge Park	Black Water	9-202-9-224	503	Conc	F.1	5	0	0	0	0		5
	Pine Ridge Park	Black Water	9-20-9-202	430	Conc	F.1	5	0	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	9-234-9-233	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	9-235-9-235A	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	9-242-9-241	N/A		F.1	0	5	0	0	0		5
	76th at 212th Street S.W.	Grease	9-254-9-255	305	Conc	F.1	5	0	0	0	0		5
	Metro	Problem Laterals - Connections	9-259-9-251	N/A		F.1	0	5	0	0	0		5
	Metro	Problem Laterals - Connections	9-262C-9-262B	N/A		F.1	0	5	0	0	0		5
	Edmonds WWTP	Problem Laterals - Connections	9-266-9-267	N/A		F.1	0	5	0	0	0		5
	7703 203 Street SW	Grit	9-314-9-313	310	Conc	F.1	5	0	0	0	0		5
	7804 200th Street	Black Water	9-347-9-346	130	Conc	F.1	5	0	0	0	0		5
	7907 200th Street (Drop MH)	Black Water	9-348-9-347	400	Conc	F.1	5	0	0	0	0		5
	7726 202 Place	Grit, Black Water	9-366-9-314	350	Conc	F.1	5	0	0	0	0		5
	Lift Station 1	Problem Laterals - Connections	9-36-9-37	N/A		F.1	0	5	0	0	0		5
	Metro	Crack	10-10-10-7	1	Multiple - Narrow	F.2	0	0	5	0	0		5
	Edmonds WWTP	Crack	11-1A-7-39A	0	Circular - Narrow	F.2	0	0	5	0	0		5
	Edmonds WWTP	Crack	11-3-11-2	0	Circular - Narrow	F.2	0	0	5	0	0		5
	Edmonds WWTP	Crack	12-196-12-198	1	Multiple - Narrow	F.2	0	0	5	0	0		5
PIPE REPAIR	Edmonds WWTP	Crack	12-24-12-23	2	Multiple - Narrow	F.2	0	0	5	0	0		5
	Edmonds WWTP	Crack	12-249-12-248	0	Multiple - Narrow	F.2	0	0	5	0	0		5
BREACH	Edmonds WWTP	Crack	12-37-12-38	0	Longitudinal - Narrow	F.2	0	0	5	0	0		5
	Edmonds WWTP	Crack	12-55-12-56	0	Longitudinal - Narrow	F.2	0	0	5	0	0		5
BREACH	Edmonds WWTP	Crack	12-8-12-6	1	Longitudinal - Narrow	F.2	0	0	5	0	0		5
	Metro	Crack	13-20-13-15	0	Longitudinal - Wider	F.2	0	0	5	0	0		5
	Metro	Crack	16-103-16-106	1	Circular - Narrow	F.2	0	0	5	0	0		5
	Metro	Crack	17-31-17-28	1	Longitudinal - Narrow	F.2	0	0	5	0	0		5
	Metro	Crack	17-63-17-64	0	Multiple - Narrow	F.2	0	0	5	0	0		5
	Lift Station 4	Crack	2-83-2-82	0	Longitudinal - Wider	F.2	0	0	5	0	0		5
	Lynnwood WWTP	Crack	3-109B-3-109A	0	Circular - Narrow	F.2	0	0	5	0	0		5
	Lynnwood WWTP	Crack	3-1H-3-3A2	0	Circular - Narrow	F.2	0	0	5	0	0		5

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Lift Station 1	Crack	4-124-4-123	0	Circular - Wider	F.2	0	0	5	0	0		5
	Lift Station 1	Crack	4-217A-4-217	0	Longitudinal - Narrow	F.2	0	0	5	0	0		5
	Lift Station 1	Crack	5-263-5-262	1	Multiple - Narrow	F.2	0	0	5	0	0		5
	Lift Station 9	Crack	5-299-5-300	1	Multiple - Narrow	F.2	0	0	5	0	0		5
	Lynnwood WWTP	Crack	5-319-5-320	0	Circular - Narrow	F.2	0	0	5	0	0		5
	Lift Station 1	Crack	7-75-7-74	1	Multiple - Narrow	F.2	0	0	5	0	0		5
	Lift Station 1	Crack	8-189-8-194	0	Spiral - Narrow	F.2	0	0	5	0	0		5
	Lift Station 1	Crack	8-206-8-205	0	Longitudinal - Narrow	F.2	0	0	5	0	0		5
	Lift Station 1	Crack	8-219H-8-219G	0	Multiple - Narrow	F.2	0	0	5	0	0		5
	Lift Station 1	Crack	8-286-8-285	0	Multiple - Narrow	F.2	0	0	5	0	0		5
	Edmonds WWTP	Crack	8-74-8-75	4	Multiple - Narrow	F.2	0	0	5	0	0		5
	Lift Station 1	Infiltration in the Joint	9-136-9-136A	N/A	Medium	F.2	0	0	5	0	0		5
	Lift Station 1	Infiltration in the Joint	9-170-9-172	N/A	Light	F.2	0	0	5	0	0		5
	Edmonds WWTP	Crack	9-274-9-275	0	Circular - Narrow	F.2	0	0	5	0	0		5
	Lift Station 9	Crack	9-326-9-327	1	Longitudinal - Narrow	F.2	0	0	5	0	0		5
		SUM of Reach	11-1-11-2				0	0	5	0	0		5
		SUM of Reach	11-21A-11-21				0	5	0	0	0		5
		SUM of Reach	12-144-12-146				0	5	0	0	0		5
		SUM of Reach	12-148-12-141				0	5	0	0	0		5
		SUM of Reach	12-151A-12-151				0	5	0	0	0		5
		SUM of Reach	12-2-12-1				0	5	0	0	0		5
		SUM of Reach	12-289-12-288A				0	2	3	0	0		5
		SUM of Reach	12-74-12-73				0	5	0	0	0		5
		SUM of Reach	12-98-12-96				0	5	0	0	0		5
		SUM of Reach	4-110-4-109				0	5	0	0	0		5
		SUM of Reach	4-115-8-219H				0	1	0	4	0		5
		SUM of Reach	5-148B-5-149				0	2	3	0	0		5
		SUM of Reach	5-239-5-238				0	5	0	0	0		5
		SUM of Reach	7-60-7-56				0	5	0	0	0		5
		SUM of Reach	8-162-8-161				0	1	0	4	0		5
		SUM of Reach	8-188B-8-188A				0	5	0	0	0		5
		SUM of Reach	8-195-8-196				0	5	0	0	0		5
		SUM of Reach	8-64B-8-64A				0	5	0	0	0		5
		SUM of Reach	9-159-9-158				0	5	0	0	0		5
		SUM of Reach	9-270-9-308				0	5	0	0	0		5
		SUM of Reach	9-289-9-290				0	5	0	0	0		5
	Metro	Depressions in Pipe	10-25-10-26	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	11-15-11-14	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	12-109A-12-111	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	12-149A-12-149	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	12-180-12-181	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	12-185F-12-185A	108		F.1	0	4	0	0	0		4
PIPE REPAIR	Edmonds WWTP	Depressions in Pipe	12-189-12-191	0		F.1	0	4	0	0	0		4
PIPE REPAIR	Edmonds WWTP	Depressions in Pipe	12-190-12-189	0		F.1	0	4	0	0	0		4
PIPE REPAIR	Edmonds WWTP	Depressions in Pipe	12-204-12-203	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	12-26-12-24	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	13-120-13-121	11		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	13-36-13-35	5		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	13-39-13-37	12		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	13-4A-13-4	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	13-57-13-59	14		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	13-59-13-60			F.1	0	4	0	0	0		4

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Metro	Depressions in Pipe	14-11-14-10	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	14-16-14-11			F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	14-21-14-4	0		F.1	0	4	0	0	0		4
	Lift Station 12	Depressions in Pipe	1-43-1-24	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	14-38-14-37	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	14-3E-14-3F	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	14-46-14-METER 3	0		F.1	0	4	0	0	0		4
BREACH	Metro	Depressions in Pipe	14-49-14-49D	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	14-69-14-68	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	16-101-16-102	3		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	16-57-16-75	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	17-19-17-23	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	17-38-17-37	4		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	17-39-17-46	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	17-46-17-47	0		F.1	0	4	0	0	0		4
BREACH	Metro	Depressions in Pipe	17-77-17-78	0		F.1	0	4	0	0	0		4
PROBLEM JOINTS	Metro	Depressions in Pipe	17-95-17-94	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	17-96-17-95	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	17-97-17-96	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	17-98-17-97	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	2-47-2-49	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	3-12-2-2	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	3-23-3-24	0		F.1	0	4	0	0	0		4
BREACH	Lift Station 12	Depressions in Pipe	3-2H-3-2I	24		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	3-8-3-9	0		F.1	0	4	0	0	0		4
BREACH	Lift Station 3	Depressions in Pipe	4-65-4-67	0		F.1	0	4	0	0	0		4
	Lift Station 3	Depressions in Pipe	4-70A-4-71-LIFT 3	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	4-79-4-78	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	5-144-5-145	1		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	5-177-5-176	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	5-187-5-191	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	5-195A-5-196	0		F.1	0	4	0	0	0		4
	Lift Station 9	Depressions in Pipe	5-283-5-288	0		F.1	0	4	0	0	0		4
ROOTS	Lift Station 9	Depressions in Pipe	5-300-5-301	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	5-321A-5-322	0		F.1	0	4	0	0	0		4
	Lynnwood WWTP	Depressions in Pipe	5-322-5N-2	0		F.1	0	4	0	0	0		4
	Lift Station 9	Depressions in Pipe	5-334A-5-334	0		F.1	0	4	0	0	0		4
ROOTS	Edmonds WWTP	Depressions in Pipe	7-23-7-53D	0		F.1	0	4	0	0	0		4
PROBLEM JOINTS	Edmonds WWTP	Depressions in Pipe	7-30C-7-30	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	7-32C-7-32D	0		F.1	0	4	0	0	0		4
Miscellaneous Meters	Lift Station 1	Depressions in Pipe	8-147-8-146	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	8-222B-8-222A	0		F.1	0	4	0	0	0		4
	Lift Station 2	Depressions in Pipe	8-296-8-297	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	8-303D-8-303C	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	8-340-8-339	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	8-37-8-39	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	8-49-8-53	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	8-89-8-108	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	8-91-8-106	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	9-100-9-101	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	9-120-9-121	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	9-137-9-139	0		F.1	0	4	0	0	0		4

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Edmonds WWTP	Depressions in Pipe	9-157-9-156	0		F.1	0	4	0	0	0		4
	Metro	Depressions in Pipe	9-253-9-254	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	9-271-9-270	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	9-274A-9-274	15		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	9-279-9-278	16		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	9-319-9-319A	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	9-321-9-322	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Depressions in Pipe	9-346-9-347	0		F.1	0	4	0	0	0		4
	Lift Station 1	Depressions in Pipe	9-55A-9-55	0		F.1	0	4	0	0	0		4
	Edmonds WWTP	Broken Hole	12-178-12-179	0		F.3	0	0	0	4	0		4
PIPE REPAIR	Edmonds WWTP	Broken	12-212-12-211	0		F.3	0	0	0	4	0		4
	Edmonds WWTP	Broken	12-269C-12-269D	0	Soil Visible - Large	F.3	0	0	0	4	0		4
	Metro	Broken	13-14-13-13	0		F.3	0	0	0	4	0		4
	Metro	Broken	14-28-14-27	0	Soil Visible - Large	F.3	0	0	0	4	0		4
	Edmonds WWTP	Broken	15-4E-15-4C	0	Soil Visible - Small	F.3	0	0	0	4	0		4
	Lift Station 3	Broken Hole	4-75-4-74	0		F.3	0	0	0	4	0		4
	Edmonds WWTP	Broken Hole	7-39C-7-40	0		F.3	0	0	0	4	0		4
	Edmonds WWTP	Broken	8-22-8-21	0	Soil Visible - Medium	F.3	0	0	0	4	0		4
	Edmonds WWTP	Broken	8-337-8-336A	0	Soil Visible - Medium	F.3	0	0	0	4	0		4
	Lift Station 1	Broken	8-351-8-350	0	Void Visible - Medium	F.3	0	0	0	4	0		4
		SUM of Reach	11-14A-11-14				0	4	0	0	0		4
		SUM of Reach	11-23C-11-21				0	4	0	0	0		4
		SUM of Reach	11-5-11-3				0	4	0	0	0		4
		SUM of Reach	12-140-12-139				0	4	0	0	0		4
		SUM of Reach	12-182A-12-215				0	4	0	0	0		4
		SUM of Reach	12-185G-12-185F				0	4	0	0	0		4
		SUM of Reach	12-19-12-28				0	4	0	0	0		4
		SUM of Reach	12-250-12-249				0	4	0	0	0		4
		SUM of Reach	13-22A-13-22B				0	4	0	0	0		4
		SUM of Reach	13-8E-13-166A				0	1	3	0	0		4
		SUM of Reach	14-35-14-34				0	4	0	0	0		4
		SUM of Reach	17-75-17-78				0	4	0	0	0		4
		SUM of Reach	2-113-2-112				0	4	0	0	0		4
		SUM of Reach	3-109H-3-109G				0	1	3	0	0		4
		SUM of Reach	3-1D-3-2G				0	4	0	0	0		4
		SUM of Reach	4-100-4-100A				0	4	0	0	0		4
		SUM of Reach	4-132-4-131				0	4	0	0	0		4
		SUM of Reach	4-141-4-142				0	1	3	0	0		4
		SUM of Reach	4-86-4-85				0	4	0	0	0		4
		SUM of Reach	8-123-8-120				0	4	0	0	0		4
		SUM of Reach	8-250-8-249				0	4	0	0	0		4
		SUM of Reach	8-29-8-43				0	4	0	0	0		4
		SUM of Reach	8-311-8-312				0	4	0	0	0		4
		SUM of Reach	8-321-7-72				0	4	0	0	0		4
		SUM of Reach	8-39A-8-41				0	4	0	0	0		4
		SUM of Reach	8-81B-8-81				0	4	0	0	0		4
		SUM of Reach	9-276-9-277				0	1	3	0	0		4
	Metro	Heavy Root Problem	10-19-10-19B	0		F.2	0	0	3	0	0		3
	Edmonds WWTP	Heavy Root Problem	12-159-12-160	0		F.2	0	0	3	0	0		3
	Edmonds WWTP	Heavy Root Problem	12-293-12-293A	0		F.2	0	0	3	0	0		3
	Edmonds WWTP	Heavy Root Problem	13-63B-13-63C	0		F.2	0	0	3	0	0		3
	Edmonds WWTP	Heavy Root Problem	15-3B-15-3A	0		F.2	0	0	3	0	0		3

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
BREACH	Metro	Heavy Root Problem	16-25-16-26	0		F.2	0	0	3	0	0		3
	Lift Station 10	Heavy Root Problem	2-113E-2-113	1		F.2	0	0	3	0	0		3
	Lynnwood WWTP	Heavy Root Problem	3-103-3-105	0		F.2	0	0	3	0	0		3
	Lynnwood WWTP	Heavy Root Problem	3-84A-3-85	0		F.2	0	0	3	0	0		3
	Lift Station 1	Heavy Root Problem	4-144-4-145	0		F.2	0	0	3	0	0		3
	Lift Station 10	Joint separated - Large	4-3-2-113B	N/A		F.2	0	0	3	0	0		3
	Lift Station 1	Heavy Root Problem	5-30-5-28	0		F.2	0	0	3	0	0		3
PROBLEM JOINTS	Lift Station 1	Heavy Root Problem	5-37-5-38	0		F.2	0	0	3	0	0		3
	Lift Station 1	Heavy Root Problem	8-207-8-206	0		F.2	0	0	3	0	0		3
	Lift Station 1	Joint separated - Large	8-346-8-343	N/A		F.2	0	0	3	0	0		3
	Lift Station 9	Heavy Root Problem	9-341-9-340A	0		F.2	0	0	3	0	0		3
	Lift Station 9	Heavy Root Problem	9-342-9-341	0		F.2	0	0	3	0	0		3
BREACH	Lynnwood WWTP	Joint Offset - Large	3-66A-3-66	N/A	Large	F.3	0	0	0	3	0		3
ROOTS	Lift Station 7	Joint Offset - Large	7-11-7-7	N/A	Large	F.3	0	0	0	3	0		3
	Edmonds WWTP	Joint Offset - Large	9-349-9-350	N/A	Large	F.3	0	0	0	3	0		3
		SUM of Reach	11-12-11-11				0	3	0	0	0		3
		SUM of Reach	12-78-12-77				0	3	0	0	0		3
		SUM of Reach	13-67-13-66				0	3	0	0	0		3
		SUM of Reach	13-8A-13-8B				0	3	0	0	0		3
		SUM of Reach	14-19-14-18				0	0	3	0	0		3
		SUM of Reach	15-1B-15-1C				0	0	3	0	0		3
		SUM of Reach	2-84-2-83				0	3	0	0	0		3
		SUM of Reach	3-109G-3-109F				0	3	0	0	0		3
		SUM of Reach	4-137-4-133				0	3	0	0	0		3
		SUM of Reach	4-140-4-139				0	3	0	0	0		3
		SUM of Reach	4-9-4-7				0	3	0	0	0		3
		SUM of Reach	5-278-5-271				0	3	0	0	0		3
		SUM of Reach	7-44A-8-331				0	3	0	0	0		3
		SUM of Reach	7-46A-7-46				0	3	0	0	0		3
		SUM of Reach	8-185-8-186				0	3	0	0	0		3
		SUM of Reach	8-289-8-288				0	3	0	0	0		3
		SUM of Reach	8-46-8-47				0	3	0	0	0		3
		SUM of Reach	8-86-8-112				0	3	0	0	0		3
		SUM of Reach	9-181-9-182				0	0	0	3	0		3
	Edmonds WWTP	Medium Root Problem	11-10-11-9B	0		F.1	0	2	0	0	0		2
	Edmonds WWTP	Medium Root Problem	12-153-12-150	0		F.1	0	2	0	0	0		2
	Edmonds WWTP	Problem Joint - Offset Medium	12-266-12-265	N/A		F.1	0	2	0	0	0		2
PIPE REPAIR	Edmonds WWTP	Medium Root Problem	12-288-12-287	0		F.1	0	2	0	0	0		2
	Edmonds WWTP	Medium Root Problem	12-33-12-31	0		F.1	0	2	0	0	0		2
BREACH	Edmonds WWTP	Joint Gasket Exposed - Medium	13-100-13-98	N/A		F.1	0	2	0	0	0		2
	Edmonds WWTP	Medium Root Problem	13-112-13-114	0		F.1	0	2	0	0	0		2
	Metro	Medium Root Problem	13-8D-13-8C	0		F.1	0	2	0	0	0		2
	Metro	Medium Root Problem	13-9A-13-166A	0		F.1	0	2	0	0	0		2
BREACH	Metro	Medium Root Problem	14-44-14-43	0		F.1	0	2	0	0	0		2
	Metro	Problem Joint - Offset Medium	16-116-16-98	N/A		F.1	0	2	0	0	0		2
	Metro	Medium Root Problem	17-44-17-46	0		F.1	0	2	0	0	0		2
	Lift Station 10	Medium Root Problem	2-109-2-108	0		F.1	0	2	0	0	0		2
	Lynnwood WWTP	Medium Root Problem	3-120-3N-4	0		F.1	0	2	0	0	0		2
	Lynnwood WWTP	Problem Joint - Offset Medium	3-60-3-68	N/A		F.1	0	2	0	0	0		2
	Lift Station 1	Medium Root Problem	4-133-4-132	0		F.1	0	2	0	0	0		2
	Lift Station 1	Medium Root Problem	4-143-4-150	0		F.1	0	2	0	0	0		2
	Lift Station 1	Medium Root Problem	4-210-4-213A	0		F.1	0	2	0	0	0		2

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Lift Station 1	Medium Root Problem	4-40-4-39	0		F.1	0	2	0	0	0		2
	Lift Station 3	Medium Root Problem	4-56-4-57	0		F.1	0	2	0	0	0		2
	Lynnwood WWTP	Medium Root Problem	5-149-5-150	0		F.1	0	2	0	0	0		2
	Lynnwood WWTP	Medium Root Problem	5-217-5-216	0		F.1	0	2	0	0	0		2
	Lift Station 9	Medium Root Problem	5-317-5-316	0		F.1	0	2	0	0	0		2
PROBLEM JOINTS	Lift Station 9	Medium Root Problem	5-330E-5-330D	0		F.1	0	2	0	0	0		2
	Lift Station 1	Medium Root Problem	5-38-5-39	0		F.1	0	2	0	0	0		2
ROOTS	Lift Station 1	Medium Root Problem	5-79-5-70	0		F.1	0	2	0	0	0		2
PROBLEM JOINTS	Lift Station 10	Medium Root Problem	5-88A-5-88B	0		F.1	0	2	0	0	0		2
	Edmonds WWTP	Problem Joint - Offset Medium	7-44-7-44A	N/A		F.1	0	2	0	0	0		2
	Lift Station 1	Medium Root Problem	8-178D-8-178C	0		F.1	0	2	0	0	0		2
	Edmonds WWTP	Problem Joint - Offset Medium	8-18A-8-18	N/A		F.1	0	2	0	0	0		2
	Lift Station 1	Medium Root Problem	8-196-8-196A	0		F.1	0	2	0	0	0		2
	Lift Station 1	Medium Root Problem	9-111-8-189D	0		F.1	0	2	0	0	0		2
	Edmonds WWTP	Problem Joint - Offset Medium	9-184-9-185	N/A		F.1	0	2	0	0	0		2
	Edmonds WWTP	Medium Root Problem	9-185-9-186	0		F.1	0	2	0	0	0		2
	Edmonds WWTP	Medium Root Problem	9-222A-9-227	0		F.1	0	2	0	0	0		2
		SUM of Reach	11-14-11-13				0	2	0	0	0		2
		SUM of Reach	11-23B-11-21				0	2	0	0	0		2
		SUM of Reach	12-89-12-88				0	2	0	0	0		2
		SUM of Reach	16-108-16-109				0	2	0	0	0		2
		SUM of Reach	17-15-17-16				0	2	0	0	0		2
		SUM of Reach	2-31-2-32				0	2	0	0	0		2
		SUM of Reach	3-121-3-120				0	2	0	0	0		2
		SUM of Reach	3-12H-3-12I				0	2	0	0	0		2
		SUM of Reach	3-2I-3-2J				0	2	0	0	0		2
		SUM of Reach	4-138-4-137				0	2	0	0	0		2
		SUM of Reach	5-195-5-195A				0	2	0	0	0		2
		SUM of Reach	5-281A-5-278				0	2	0	0	0		2
		SUM of Reach	7-64-7-62				0	2	0	0	0		2
		SUM of Reach	7-86-7-87A				0	2	0	0	0		2
		SUM of Reach	8-101B-8-101A				0	2	0	0	0		2
		SUM of Reach	8-13-8-21A				0	2	0	0	0		2
		SUM of Reach	8-172J-8-172F				0	2	0	0	0		2
		SUM of Reach	8-193-8-192				0	2	0	0	0		2
		SUM of Reach	8-21-8-21A				0	2	0	0	0		2
		SUM of Reach	8-288-8-287				0	2	0	0	0		2
		SUM of Reach	8-316-8-135				0	2	0	0	0		2
		SUM of Reach	8-317-8-316				0	2	0	0	0		2
		SUM of Reach	8-324-7-68				0	2	0	0	0		2
		SUM of Reach	8-44-8-45				0	2	0	0	0		2
		SUM of Reach	9-84-9-83				0	2	0	0	0		2
	SE Corner of Hwy 99 and 224th	Clean Flume	14			F.1	0	1	0	0	0		1
	22304 Hwy 99	Clean Flume	14			F.1	0	1	0	0	0		1
	Edmonds Way Robinhood Lane	Brush Sensor	15			F.1	0	1	0	0	0		1
	244th and Hwy 99 - NW Corner	Clean Flume	16			F.1	0	1	0	0	0		1
	Denny's on SR 104 and Hwy 99	Clean Flume	17			F.1	0	1	0	0	0		1
	Old Ballinger Pump Station	Clean Flume	17			F.1	0	1	0	0	0		1
	East Side, NE Corner of Balling	Clean Flume	17			F.1	0	1	0	0	0		1
	Ballinger Golf Course at 74th A	Clean Flume	17			F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-108-12-109	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-12-12-13	0		F.1	0	1	0	0	0		1

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Edmonds WWTP	Light Root Problem	12-151-12-22	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-163-12-162	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-165-12-164	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-18-12-19	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Problem Joints - Offset	12-204I-12-204H			F.1	0	1	0	0	0		1
PIPE REPAIR	Edmonds WWTP	Problem Joints - Offset	12-204J-12-204I			F.1	0	1	0	0	0		1
	Edmonds WWTP	Joint separated - Small	12-207-12-206	N/A		F.1	0	1	0	0	0		1
BREACH	Edmonds WWTP	Light Root Problem	12-217-12-216	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-22-12-20	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-234B-12-234A	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-284F-12-284	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	12-70-12-69	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Roots	12-84-12-84A	42		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	13-133-13-134	0		F.1	0	1	0	0	0		1
	Metro	Roots	13-139-13-142	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Problem Joint - Offset Small	13-55-13-56	N/A		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	13-8-13-8B	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	13-89-9-11	0		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	14-33-14-32	0		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	14-7C-14-7A	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	15-1C-15-2	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Roots	15-3A-15-2A	0		F.1	0	1	0	0	0		1
	Metro	Joint separated - Small	16-115-16-116	N/A		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	16-32-16-33	0		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	16-4-16-3	0		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	16-46-16-47	0		F.1	0	1	0	0	0		1
BREACH	Metro	Light Root Problem	16-54-16-57	0		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	16-91-16-103	0		F.1	0	1	0	0	0		1
	Metro	Roots	17-24-17-25	0		F.1	0	1	0	0	0		1
	Metro	Roots	17-25-17-26	0		F.1	0	1	0	0	0		1
	Metro	Roots	17-55-17-58	0		F.1	0	1	0	0	0		1
	Metro	Roots	17-57-17-58	0		F.1	0	1	0	0	0		1
	Lift Station 10	Problem Joint - Offset Small	2-111-2-110	N/A		F.1	0	1	0	0	0		1
	Lift Station 4	Roots	2-90-2-89	0		F.1	0	1	0	0	0		1
	Lynnwood WWTP	Light Root Problem	3-133-3-134	0		F.1	0	1	0	0	0		1
	Lynnwood WWTP	Problem Joint - Offset Small	3-140-3-137	N/A		F.1	0	1	0	0	0		1
	Lynnwood WWTP	Problem Joint - Offset Small	3-162-3-163	N/A		F.1	0	1	0	0	0		1
BREACH	Lynnwood WWTP	Light Root Problem	3-63-3-64	0		F.1	0	1	0	0	0		1
	Lift Station 12	Problem Joint - Offset Small	3-8F-3-8A	N/A		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	4-109-4-108	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	4-115-8-219H	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	4-145-4-143	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	4-170-4-171	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	4-186A-4-186	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	4-212-4-213	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	4-221-4-220	0		F.1	0	1	0	0	0		1
	Lift Station 3	Light Root Problem	4-45-4-46	0		F.1	0	1	0	0	0		1
	Lift Station 3	Light Root Problem	4-46-4-47	0		F.1	0	1	0	0	0		1
	Lift Station 3	Light Root Problem	4-69A-4-70	0		F.1	0	1	0	0	0		1
BREACH	Lift Station 1	Light Root Problem	5-118C-5-118B	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	5-123-4-186A	0		F.1	0	1	0	0	0		1
	Lynnwood WWTP	Light Root Problem	5-13-5-12	0		F.1	0	1	0	0	0		1

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Lift Station 1	Light Root Problem	5-141A-5-141	0		F.1	0	1	0	0	0		1
	Lynnwood WWTP	Light Root Problem	5-194-5-195	0		F.1	0	1	0	0	0		1
	Lynnwood WWTP	Light Root Problem	5-218-5-210	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	5-252A-5-252B	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	5-264-5-263	0		F.1	0	1	0	0	0		1
ROOTS	Lift Station 9	Light Root Problem	5-299-5-300	0		F.1	0	1	0	0	0		1
ROOTS	Lynnwood WWTP	Roots	5-324A-5N-3	0		F.1	0	1	0	0	0		1
	Lift Station 9	Light Root Problem	5-330-5-329	0		F.1	0	1	0	0	0		1
ROOTS	Lift Station 1	Light Root Problem	5-344-5-345	0		F.1	0	1	0	0	0		1
ROOTS	Lift Station 1	Roots	5-52-5-51	0		F.1	0	1	0	0	0		1
	Lynnwood WWTP	Light Root Problem	5-75-5-74	0		F.1	0	1	0	0	0		1
	Lift Station 10	Roots	5-88B-5-88C	0		F.1	0	1	0	0	0		1
	Lift Station 10	Light Root Problem	5-89-5-99	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	7-62-7-61	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	7-82-7-83	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	7-85-7-86	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-102-8-101	0		F.1	0	1	0	0	0		1
Miscellaneous Meters	Lift Station 1	Light Root Problem	8-137-8-292A	0		F.1	0	1	0	0	0		1
Miscellaneous Meters	Lift Station 1	Light Root Problem	8-152-8-150	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-172K-8-172G	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-177-8-176	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-187A-8-187	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-188A-8-188C	0		F.1	0	1	0	0	0		1
	Lift Station 1	Roots	8-189B-8-189A	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-209-8-210	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-219A-8-219C	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-239-8-238	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-254-8-253	0		F.1	0	1	0	0	0		1
	Lift Station 1	Joint Separated	8-263-8-252	N/A		F.1	0	1	0	0	0		1
	Lift Station 1	Problem Joint - Offset Small	8-273-8-272	N/A		F.1	0	1	0	0	0		1
	Lift Station 2	Light Root Problem	8-294-8-295	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-323-8-321	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	8-69-8-70	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	8-95-8-96	0		F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	9-134-9-136	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	9-177-9-158A	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	9-225B-9-225	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Problem Joint - Offset Small	9-235A-9-235B	N/A		F.1	0	1	0	0	0		1
	Edmonds WWTP	Problem Joint - Offset Small	9-235B-9-217	N/A		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	9-237-9-236	0		F.1	0	1	0	0	0		1
	Edmonds WWTP	Light Root Problem	9-360-9-346	6		F.1	0	1	0	0	0		1
	Lift Station 1	Problem Joints - Offset	9-44-9-43			F.1	0	1	0	0	0		1
	Lift Station 1	Light Root Problem	9-85-9-86	0		F.1	0	1	0	0	0		1
	Metro	Light Root Problem	INLET-13-167	0		F.1	0	1	0	0	0		1
	Lake Ballinger Way and 205th S	Clean Flume				F.1	0	1	0	0	0		1
		SUM of Reach	12-180A-12-180				0	1	0	0	0		1
		SUM of Reach	16-33-16-36				0	1	0	0	0		1
		SUM of Reach	9-273C-9-273B				0	1	0	0	0		1
	Edmonds WWTP	Debris and Deposits	12-100-12-99	N/A		F.1	0	0	0	0	0		0
	Edmonds WWTP	Debris and Deposits	12-10-12-11	N/A		F.1	0	0	0	0	0		0
	Edmonds WWTP	Debris and Deposits	12-144-12-146	N/A		F.1	0	0	0	0	0		0
	Edmonds WWTP	Debris and Deposits	12-177-12-176	N/A		F.1	0	0	0	0	0		0

Table F.6 Composite Capital Improvement Projects - All categories							Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
	Metro	Debris and Deposits	13-23B-9-250	N/A		F.1	0	0	0	0	0		0
	Edmonds WWTP	Debris and Deposits	13-47-13-46	N/A		F.1	0	0	0	0	0		0
	9126 Bowdoin	N/A	13-C/O	C/O	PVC	F.1	0	0	0	0	0		0
	Lift Station 12	Debris and Deposits	1-51-1-50	N/A		F.1	0	0	0	0	0		0
	Lift Station 12	Debris and Deposits	1-57-1-56	N/A		F.1	0	0	0	0	0		0
BREACH	Metro	Debris and Deposits	16-39-16-40	N/A		F.1	0	0	0	0	0		0
	240th At Highway 99	None	16-60-16-59	330	Conc	F.1	0	0	0	0	0		0
	Metro	Debris and Deposits	16-65-16-77	N/A		F.1	0	0	0	0	0		0
	Lift Station 12	Debris and Deposits	1-67-1-66	N/A		F.1	0	0	0	0	0		0
	Metro	Debris and Deposits	16-82-16-83	N/A		F.1	0	0	0	0	0		0
BREACH	Metro	Debris and Deposits	16-95-16-96	N/A		F.1	0	0	0	0	0		0
	Metro	Debris and Deposits	17-43-17-42	N/A		F.1	0	0	0	0	0		0
	Lynnwood WWTP	Debris and Deposits	2-11-2-10	N/A		F.1	0	0	0	0	0		0
BREACH	Lift Station 4	Debris and Deposits	2-62-2-63	N/A		F.1	0	0	0	0	0		0
	Lynnwood WWTP	Joint Gasket Exposed - Light	3-89-3-72	N/A		F.1	0	0	0	0	0		0
BREACH	Lift Station 1	Debris and Deposits	4-135-4-136	N/A		F.1	0	0	0	0	0		0
	Lift Station 1	Debris and Deposits	4-34-4-36	N/A		F.1	0	0	0	0	0		0
	Lift Station 1	Debris and Deposits	4-39-4-41	N/A		F.1	0	0	0	0	0		0
	Lift Station 1	Debris and Deposits	4-98-4-97	N/A		F.1	0	0	0	0	0		0
	Lynnwood WWTP	Debris and Deposits	5-164-5-163	N/A		F.1	0	0	0	0	0		0
ROOTS	8015 196th St SW		5-334A CO to mair	60	PVC	F.1	0	0	0	0	0		0
	Edmonds WWTP	Debris and Deposits	7-39A-7-39B	N/A		F.1	0	0	0	0	0		0
	Lift Station 1	Debris and Deposits	8-291B-8-291A	N/A		F.1	0	0	0	0	0		0
	7th Ave at Sprague St	None	8-316-8-99	290	Conc	F.1	0	0	0	0	0		0
	7th at Edmonds St	None	8-99-8-98	102	Conc	F.1	0	0	0	0	0		0
	Metro	Debris and Deposits	9-247-9-248	N/A		F.1	0	0	0	0	0		0
	Edmonds WWTP	Debris and Deposits	9-272-9-271	N/A		F.1	0	0	0	0	0		0
	Lift Station 1	Debris and Deposits	9-62-9-61	N/A		F.1	0	0	0	0	0		0
BREACH	Lift Station 12	Pipe Repair	1-75-1-74	4		F.3	0	0	0	0	0		0
		SUM of Reach	10-4-10-5				0	0	0	0	0		0
		SUM of Reach	12-102-12-101				0	0	0	0	0		0
		SUM of Reach	12-292-12-293				0	0	0	0	0		0
		SUM of Reach	1-46-1-45				0	0	0	0	0		0
		SUM of Reach	4-72A-4-72				0	0	0	0	0		0
		SUM of Reach	5-246-5-245				0	0	0	0	0		0

Table F.7 Composite Capital Improvement Projects - Without Granite O&M Only							Ranking and Point Assignment					
CIP Ranking and Number	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	Red Area	Granite - Trechless	Granite - Dig up and Replace	Capacity - Model	Observed Surcharged Conditions	TOTAL
Coll -1		SUM of Reach	8-75-8-57	144			0	38	0	0		38
Coll -2		SUM of Reach	8-50-8-52	213	Increase 10" to 12"	F.5	0	15	8	10		33
Coll -3		SUM of Reach	8-58-8-57	657			0	30	0	0		30
Coll -4		SUM of Reach	17-61-17-84	484	Increase 24" to 36"	F.5	0	0	0	10	20	30
Coll -5		SUM of Reach	8-265-8-266	438	Increase 15" to 21"	F.5	0	0	0	10	20	30
Coll -6	Metro	SUM of Reach	17-47-17-48	500	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30
Coll -7	Metro	SUM of Reach	17-48-17-59	506	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30
Coll -8	Metro	SUM of Reach	17-60-17-61	179	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30
Coll -9	Metro	SUM of Reach	17-84-17-85	457	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30
Coll -10	Metro	SUM of Reach	17-85-17-86	111	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30
Coll -11	Metro	SUM of Reach	17-86-17-87	43	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30
Coll -12	Metro	SUM of Reach	17-87-17-88	35	Increase 24" to 36"	F.1 and F.5	0	0	0	10	20	30
Coll -13		SUM of Reach	9-224-9-202	591	Increase 8" to 15"	F.5	10	10	0	10		30
Coll -14		SUM of Reach	8-244-8-243	305	Increase 10" to 12"	F.5	0	0	0	10	20	30
Coll -15		Capacity - Model	17-59-17-60	463	Increase 24" to 36"	F.5	0	0	0	10	20	30
Coll -16		SUM of Reach	12-75-8-14	349			0	0	28	0		28
Coll -17		SUM of Reach	11-8-11-7	207			0	26	0	0		26
Coll -18		SUM of Reach	12-143-12-142	475			0	25	0	0		25
Coll -19		SUM of Reach	13-53-9-212	325			0	25	0	0		25
Coll -20		SUM of Reach	8-249-8-265	98			0	3	0	0	20	23
Coll -21		SUM of Reach	12-109-12-110	319			0	20	0	0		20
Coll -22		SUM of Reach	8-332-8-331	144			0	20	0	0		20
Coll -23	Lift Station 1	Roots	8-246-8-247	180		F.1	0	0	0	0	20	20
Coll -24	Edmonds WWTP	SUM of Reach	16-128-16-129	252	Increase 24" to 36"	F.3	0	0	10	10		20
Coll -25	Edmonds WWTP	SUM of Reach	12-73-12-75	247	Increase 8 to 12"	F.3 and F.5	0	0	10	10		20
Coll -26	Edmonds WWTP	SUM of Reach	16-133-16-134	379	Increase 24" to 36"	F.3 and F.5	0	0	10	10		20
Coll -27		SUM of Reach	8-243-8-242	305	Increase 10" to 12"	F.5	0	10	0	10		20
Coll -28		SUM of Reach	8-280-8-281	371	Increase 15" to 21"	F.5	0	10	0	10		20
Coll -29		SUM of Reach	1-55-1-52	297			0	0	20	0		20
Coll -30		Observed Surcharge	8-242-8-245	78							20	20
Coll -31		Observed Surcharge	8-245-8-246	173							20	20
Coll -32		Observed Surcharge	8-247-8-248	71							20	20
Coll -33		Observed Surcharge	8-248-8-249	147							20	20
Coll -34		SUM of Reach	12-84A-12-83	189			0	5	14	0		19
Coll -35		SUM of Reach	12-101-12-95	406			0	5	14	0		19
Coll -36		SUM of Reach	12-49-12-50	220			0	8	10	0		18
Coll -37		SUM of Reach	13-22-13-22A	247			0	18	0	0		18
Coll -38		SUM of Reach	8-68B-8-68	217			0	17	0	0		17
Coll -39		SUM of Reach	12N-79-13-65B	109			0	3	14	0		17
Coll -40		SUM of Reach	8-107-8-106	201			0	10	6	0		16
Coll -41		SUM of Reach	7-79-7-80	419			0	15	0	0		15
Coll -42		SUM of Reach	8-285-8-284	319			0	15	0	0		15
Coll -43		SUM of Reach	8-51-8-50	150	Increase 10" to 12"	F.5	0	5	0	10		15
Coll -44		SUM of Reach	8-281-8-282	281	Increase 15" to 21"	F.5	0	5	0	10		15
Coll -45	Metro	SUM of Reach	17-78-17-82	266	Longitudinal - Wider (8" - 12")	F.2 and F.5	0	5	0	10		15
Coll -46		SUM of Reach	12-126-12-125	443			0	15	0	0		15
Coll -47		SUM of Reach	7-9-7-10	304			0	14	0	0		14

Coll -48		SUM of Reach	12-134-12-132	159			0	14	0	0		14
Coll -49		SUM of Reach	12-132-12-131	129			0	14	0	0		14
Coll -50		SUM of Reach	9-299-9-298	145			0	3	10	0		13
Coll -51		SUM of Reach	14-56-14-62	406	Increase 12" to 18"	F.5	0	3	0	10		13
Coll -52		SUM of Reach	12-248-12-247	128			0	13	0	0		13
Coll -53		SUM of Reach	8-136-8-137	401			0	12	0	0		12
Coll -54		SUM of Reach	9-363A-9-363	318			0	12	0	0		12
Coll -55		SUM of Reach	14-3-14-3A	105			0	9	3	0		12
Coll -56		SUM of Reach	2-113A-2-113	336			0	11	0	0		11
Coll -57		SUM of Reach	12-133-12-134	197			0	0	10	0		10
Coll -58		SUM of Reach	14-66-14-65	348			0	10	0	0		10
Coll -59		SUM of Reach	14-34-14-33	328	Increase 10" to 12"	F.5	0	0	0	10		10
Coll -60		SUM of Reach	8-4-8-5	262	Increase 8" to 12"	F.5	0	0	0	10		10
Coll -61		SUM of Reach	8-135-8-316	96			5	5	0	0		10
Coll -62		SUM of Reach	9-20-9-19	268	Increase 10" to 15"		0	0	0	10		10
Coll -63		SUM of Reach	9-11-9-10	268	Increase 10" to 15"	F.5	0	0	0	10		10
Coll -64	Edmonds WWTP	SUM of Reach	8-35-8-36	287	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10
Coll -65		SUM of Reach	1-36A-1-36	214			0	0	10	0		10
Coll -66		SUM of Reach	8-114-8-113	269			0	0	10	0		10
Coll -67		SUM of Reach	8-240-8-239	336			0	10	0	0		10
Coll -68		SUM of Reach	8-59-8-58	148			0	10	0	0		10
Coll -69	Metro	SUM of Reach	14-48-14-50	130	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10
Coll -70	Metro	SUM of Reach	17-88-17-89	19	Increase 24" to 36"	F.1 and F.5	0	0	0	10		10
Coll -71	Edmonds WWTP	SUM of Reach	7-47-7-50	187	Increase 12" to 18"	F.1 and F.5	0	0	0	10		10
Coll -72	Edmonds WWTP	SUM of Reach	7-48-7-47	166	Increase 12" to 18"	F.1 and F.5	0	0	0	10		10
Coll -73	Edmonds WWTP	SUM of Reach	8-34-8-35	334	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10
Coll -74	Edmonds WWTP	SUM of Reach	9-193-9-196	128	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10
Coll -75	Edmonds WWTP	SUM of Reach	9-19-9-18	50	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10
Coll -76	Edmonds WWTP	SUM of Reach	9-201-9-202	280	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10
Coll -77	Edmonds WWTP	SUM of Reach	9-202-9-20	299	Increase 10" to 15"	F.1 and F.5	0	0	0	10		10
Coll -78		SUM of Reach	4-163-4-162	295	Increase 10" to 12"	F.5	0	0	0	10		10
Coll -79		SUM of Reach	9-188-9-189	174	Increase 8" to 12"	F.5	0	0	0	10		10
Coll -80		SUM of Reach	14-65-14-64	175			0	0	10	0		10
Coll -81		SUM of Reach	7-50-7-52	159			0	10	0	0		10
Coll -82		SUM of Reach	8-41-8-42	332	Increase 8" to 15"	F.5	0	0	0	10		10
Coll -83		SUM of Reach	8-2-8-2A	197	Increase 8" to 12"	F.5	0	0	0	10		10
Coll -84		SUM of Reach	8-2A-8-3	134	Increase 8" to 12"	F.5	0	0	0	10		10
Coll -85	Edmonds WWTP	SUM of Reach	11-19-11-18	526	Increase from 24 to 42	F.5	0	0	0	10		10
Coll -86		SUM of Reach	3-12F-3-12E	116			0	0	10	0		10
Coll -87		SUM of Reach	8-97-8-98	186			0	10	0	0		10
Coll -88	Lift Station 1	SUM of Reach	4-83-4-82	150	Increase 10" to 12"	F.1 and F.5	0	0	0	10		10
Coll -89	Edmonds WWTP	SUM of Reach	7-33-7-32	441	Increase 30" to 42"	F.1 and F.5	0	0	0	10		10
	Edmonds WWTP	Hole in Pipe - Large	12-105M-12-105K	1		F.3	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-181-12-182	0		F.3	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-42-12-43	0		F.3	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-57-12-58	0		F.3	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	12-71-12-73	0		F.3	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	13-65A-12-7	0		F.3	0	0	10	0		10
	Metro	Pipe Repair	14-73-14-72	0		F.3	0	0	10	0		10
	Metro	Pipe Repair	16-27-16-31	0		F.3	0	0	10	0		10
	Lift Station 12	Pipe Repair	1-79-1-78	8		F.3	0	0	10	0		10
	Lift Station 4	Hole in Pipe - Large	2-64B-2-68	0		F.3	0	0	10	0		10
	Lynnwood WWTP	Pipe Repair	3-65-3-66A	0		F.3	0	0	10	0		10
	Edmonds WWTP	Pipe Repair	7-39B-7-39C	0		F.3	0	0	10	0		10
	Storm Lines	Pipe Repair	8-322	0		F.3	0	0	10	0		10

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
		SUM of Reach	8-58-8-57					0	176	30	0	0	206	176
		SUM of Reach	8-77-8-76					0	44	5	0	0	49	44
		SUM of Reach	8-50-8-52					0	34	15	8	0	57	34
		SUM of Reach	8-68-8-68A					0	31	8	0	0	39	31
		SUM of Reach	7-79-7-80					0	30	15	0	0	45	30
		SUM of Reach	8-76-8-75					0	29	5	0	0	34	29
		SUM of Reach	17-61-17-84					0	28	0	0	0	28	28
		SUM of Reach	7-78-7-79					0	28	0	0	0	28	28
		SUM of Reach	5-267-5-261					0	25	0	0	0	25	25
		SUM of Reach	8-3-8-4					0	24	0	0	0	24	24
		SUM of Reach	5-260-5-344					0	23	5	0	0	28	23
		SUM of Reach	8-52-8-59					0	23	0	0	0	23	23
		SUM of Reach	5-261-5-260					0	22	5	0	0	27	22
		SUM of Reach	13-21A-13-21					0	19	3	0	0	22	19
		SUM of Reach	4-60-4-62					0	19	0	0	0	19	19
		SUM of Reach	8-UNK 1-8-330A					0	19	0	0	0	19	19
		SUM of Reach	10-27-10-28					0	18	0	0	0	18	18
		SUM of Reach	8-182-8-179					0	18	0	0	0	18	18
		SUM of Reach	8-73-8-74					0	17	0	0	0	17	17
		SUM of Reach	12-133-12-134					0	16	0	10	0	26	16
		SUM of Reach	14-66-14-65					0	16	10	0	0	26	16
		SUM of Reach	12-1-8-1					0	16	0	0	0	16	16
		SUM of Reach	13-4-14-49					0	16	0	0	0	16	16
		SUM of Reach	14-67-14-66					0	16	0	0	0	16	16
		SUM of Reach	17-23-17-39					0	16	0	0	0	16	16
		SUM of Reach	8-21A-8-51					0	16	0	0	0	16	16
		SUM of Reach	7-9-7-10					0	15	14	0	0	29	15
		SUM of Reach	8-78-8-77					0	15	3	4	0	22	15
		SUM of Reach	7-37-7-36					0	15	5	0	0	20	15
		SUM of Reach	7-43-7-40					0	15	0	0	0	15	15
		SUM of Reach	7-61-7-60					0	15	0	0	0	15	15
		SUM of Reach	7-81-7-82					0	15	0	0	0	15	15
		SUM of Reach	8-178-8-177A					0	15	0	0	0	15	15
		SUM of Reach	8-31-8-30					0	15	0	0	0	15	15
		SUM of Reach	8-136-8-137					0	14	12	0	0	26	14
		SUM of Reach	7-34-7-30					0	14	5	0	0	19	14
		SUM of Reach	4-78-8-244					0	14	0	0	0	14	14
		SUM of Reach	5-334B-5-334A					0	14	0	0	0	14	14
		SUM of Reach	7-66-8-327					0	14	0	0	0	14	14
		SUM of Reach	7-83-7-84					0	14	0	0	0	14	14
		SUM of Reach	8-269-8-267					0	14	0	0	0	14	14
		SUM of Reach	8-54-8-56					0	14	0	0	0	14	14
		SUM of Reach	8-59A-8-59					0	13	9	0	0	22	13
		SUM of Reach	14-34-14-33					0	13	0	0	0	13	13
		SUM of Reach	8-18-8-55					0	13	0	0	0	13	13
		SUM of Reach	11-8-11-7					0	12	26	0	0	38	12
		SUM of Reach	11-9A-7-35					0	12	0	0	0	12	12
		SUM of Reach	8-4-8-5					0	12	0	0	0	12	12
		SUM of Reach	8-60-8-59A					0	12	0	0	0	12	12
		SUM of Reach	8-87-8-86					0	12	0	0	0	12	12
		SUM of Reach	7-46-7-47					0	11	5	0	0	16	11
		SUM of Reach	12-54-12-53					0	11	0	0	0	11	11
		SUM of Reach	9-109-8-193					0	11	0	0	0	11	11

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
		SUM of Reach	12-84A-12-83					0	10	5	14	0	29	10
		SUM of Reach	8-112-8-117					0	10	5	0	0	15	10
		SUM of Reach	12-121-12-119					0	10	0	0	0	10	10
		SUM of Reach	12-123-12-121					0	10	0	0	0	10	10
		SUM of Reach	12-13-12-14					0	10	0	0	0	10	10
		SUM of Reach	12-14-12-15					0	10	0	0	0	10	10
		SUM of Reach	12-156-12-155					0	10	0	0	0	10	10
		SUM of Reach	12-87-12-86					0	10	0	0	0	10	10
		SUM of Reach	13-166A-13-166					0	10	0	0	0	10	10
		SUM of Reach	13-81A-13-81B					0	10	0	0	0	10	10
		SUM of Reach	14-7L-14-7B					0	10	0	0	0	10	10
		SUM of Reach	5-156-5-151					0	10	0	0	0	10	10
		SUM of Reach	7-56-7-55					0	10	0	0	0	10	10
		SUM of Reach	8-167-8-165					0	10	0	0	0	10	10
		SUM of Reach	8-257-8-257A					0	10	0	0	0	10	10
		SUM of Reach	8-291A-8-291					0	10	0	0	0	10	10
		SUM of Reach	8-298-8-297					0	10	0	0	0	10	10
		SUM of Reach	8-329A-8-329					0	10	0	0	0	10	10
		SUM of Reach	8-5-8-6					0	10	0	0	0	10	10
		SUM of Reach	8-135-8-316					5	9	5	0	0	19	9
		SUM of Reach	8-155-8-352					0	9	0	0	0	9	9
		SUM of Reach	9-347-9-348					0	9	0	0	0	9	9
		SUM of Reach	9-363A-9-363					0	8	12	0	0	20	8
		SUM of Reach	3-66E-3-66D					0	8	3	3	0	14	8
		SUM of Reach	9-262A-9-262					0	8	5	0	0	13	8
		SUM of Reach	5-42-5-41					0	8	0	3	0	11	8
		SUM of Reach	12-28-8-2					0	8	0	0	0	8	8
		SUM of Reach	13-157-13-156					0	8	0	0	0	8	8
		SUM of Reach	13-56-13-57					0	8	0	0	0	8	8
		SUM of Reach	3-94-3-93					0	8	0	0	0	8	8
		SUM of Reach	5-325-5N-11					0	8	0	0	0	8	8
		SUM of Reach	5-7-5-8					0	8	0	0	0	8	8
		SUM of Reach	8-197-8-199					0	8	0	0	0	8	8
		SUM of Reach	8-70-8-71					0	8	0	0	0	8	8
		SUM of Reach	8-99-8-316					0	8	0	0	0	8	8
		SUM of Reach	9-175-9-177					0	8	0	0	0	8	8
		SUM of Reach	9-20-9-19					0	8	0	0	0	8	8
		SUM of Reach	9-314-9-366					0	8	0	0	0	8	8
		SUM of Reach	9-364-9-363					0	8	0	0	0	8	8
		SUM of Reach	9-150-5-336					0	7	5	0	0	12	7
		SUM of Reach	8-203-8-202					0	7	0	4	0	11	7
		SUM of Reach	12-175-12-146					0	7	0	0	0	7	7
		SUM of Reach	16-106-16-110					0	7	0	0	0	7	7
		SUM of Reach	16-59-16-60					0	7	0	0	0	7	7
		SUM of Reach	4-131-4-100					0	7	0	0	0	7	7
		SUM of Reach	4-134-4-133					0	7	0	0	0	7	7
		SUM of Reach	8-291-8-283					0	7	0	0	0	7	7
		SUM of Reach	8-43-8-44					0	7	0	0	0	7	7
		SUM of Reach	8-107-8-106					0	6	10	6	0	22	6
		SUM of Reach	9-299-9-298					0	6	3	10	0	19	6
		SUM of Reach	11-6-11-5					0	6	8	0	0	14	6
		SUM of Reach	12-95-12-94					0	6	5	0	0	11	6
		SUM of Reach	8-72-8-73					0	6	5	0	0	11	6
		SUM of Reach	12-246-12-243					0	6	3	0	0	9	6

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
		SUM of Reach	12-135-12-134					0	6	0	0	0	6	6
		SUM of Reach	12-160-12-149					0	6	0	0	0	6	6
		SUM of Reach	12-208-12-207					0	6	0	0	0	6	6
		SUM of Reach	12-287-12-286					0	6	0	0	0	6	6
		SUM of Reach	16-37-16-38					0	6	0	0	0	6	6
		SUM of Reach	2-27-2-25					0	6	0	0	0	6	6
		SUM of Reach	4-30-4-28					0	6	0	0	0	6	6
		SUM of Reach	5-14-5-15					0	6	0	0	0	6	6
	Lynnwood WWTP	Problem Laterals - Abandoned	5-203-5-201	N/A		F.1		0	6	0	0	0	6	6
		SUM of Reach	5-74-5-72					0	6	0	0	0	6	6
		SUM of Reach	8-265-8-266					0	6	0	0	0	6	6
		SUM of Reach	8-55-8-55A					0	6	0	0	0	6	6
		SUM of Reach	9-11-9-10					0	6	0	0	0	6	6
		SUM of Reach	9-262B-9-262A					0	6	0	0	0	6	6
		SUM of Reach	9-273-9-274					0	6	0	0	0	6	6
		SUM of Reach	9-287-9-286					0	6	0	0	0	6	6
		SUM of Reach	12-143-12-142					0	5	25	0	0	30	5
		SUM of Reach	12-109-12-110					0	5	20	0	0	25	5
		SUM of Reach	8-332-8-331					0	5	20	0	0	25	5
		SUM of Reach	8-285-8-284					0	5	15	0	0	20	5
		SUM of Reach	1-36A-1-36					0	5	0	10	0	15	5
		SUM of Reach	8-114-8-113					0	5	0	10	0	15	5
		SUM of Reach	8-240-8-239					0	5	10	0	0	15	5
		SUM of Reach	8-59-8-58					0	5	10	0	0	15	5
		SUM of Reach	2-29-2-28					0	5	5	4	0	14	5
		SUM of Reach	7-35-7-33B					0	5	5	4	0	14	5
		SUM of Reach	8-71-8-72					0	5	9	0	0	14	5
		SUM of Reach	10-6-10-5					0	5	8	0	0	13	5
		SUM of Reach	14-29-14-28					0	5	8	0	0	13	5
		SUM of Reach	12-139-12-138					0	5	5	0	0	10	5
		SUM of Reach	12-16-12-17					0	5	5	0	0	10	5
		SUM of Reach	2-91-2-90					0	5	5	0	0	10	5
		SUM of Reach	7-65-7-66					0	5	5	0	0	10	5
		SUM of Reach	8-101A-8-100					0	5	5	0	0	10	5
		SUM of Reach	11-23A-11-21					0	5	0	4	0	9	5
		SUM of Reach	12-105B-12-105A					0	5	3	0	0	8	5
		SUM of Reach	4-196-4-200					0	5	3	0	0	8	5
		SUM of Reach	5-135-5-134					0	5	3	0	0	8	5
		SUM of Reach	7-49-7-49A					0	5	3	0	0	8	5
	Edmonds WWTP	Problem Laterals - Connections	11-2-11-7	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	11-21A-11-21					0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	11-7-11-9	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-111-12-68	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-119-12-117	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-124-12-123	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-125-12-123	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-127-12-125	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-129-12-127	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-137-12-136	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-144-12-146	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	12-144-12-146					0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-147-12-148	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	12-148-12-141					0	5	0	0	0	5	5
		SUM of Reach	12-151A-12-151					0	5	0	0	0	5	5

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
	Edmonds WWTP	Problem Laterals - Connections	12-154-12-153	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-17-12-18	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-209-12-207	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	12-2-12-1					0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-46-12-46A	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-47-12-49	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-5-12-2	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-6-12-5	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-69-12-67	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	12-74-12-73					0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-90-12-87	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	12-94A-12-94	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	12-98-12-96					0	5	0	0	0	5	5
	Metro	Problem Laterals - Connections	13-146-13-145	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	13-87-13-88	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 12	Problem Laterals - Connections	1-39-1-38	N/A		F.1	Lateral Bloc	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	13-99-13-98	N/A		F.1	Connection	0	5	0	0	0	5	5
	Metro	Problem Laterals - Connections	14-47-14-48	N/A		F.1	Connection	0	5	0	0	0	5	5
	Metro	Problem Laterals - Connections	14-70-14-69	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	15-3C-15-3B	N/A		F.1	Connection	0	5	0	0	0	5	5
	Metro	Problem Laterals - Connections	16-99-16-102	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 12	Problem Laterals - Connections	1-9-1-9A	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 4	Problem Laterals - Connections	2-131-2-132	N/A		F.1		0	5	0	0	0	5	5
	Lynnwood WWTP	Problem Laterals - Connections	3-130-3-129	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lynnwood WWTP	Problem Laterals - Connections	3-157-3-156	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	4-110-4-109					0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	4-119-4-121	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	4-13-4-42	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	4-171-4-173A	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 3	Problem Laterals - Connections	4-58-4-59	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 3	Problem Laterals - Connections	4-62-4-63	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	5-113-5-111	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	5-137-5-136	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lynnwood WWTP	Problem Laterals - Connections	5-160-5-159	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	5-239-5-238					0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	5-240B-5-240A	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 9	Problem Laterals - Connections	5-309-5-304	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lynnwood WWTP	Problem Laterals - Connections	5-324-5-324A	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	5-55-5-54	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	5-67-5-66	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	5-81-5-80	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	5-87-5-86	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 10	Problem Laterals - Connections	5-88G-5-88E	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	7-59-7-57	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	7-60-7-56					0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	7-69-7-70	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	7-80-7-61	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-150-8-149	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-160-8-159	N/A		F.1	Lateral Bloc	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-163-8-162	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-165-8-164	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-172A-8-172	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-183-8-182	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	8-188B-8-188A					0	5	0	0	0	5	5

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
		SUM of Reach	8-195-8-196					0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-255-8-254	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-257A-8-254	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-285-8-284	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-28-8-27	N/A		F.1	Connection	0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	8-303-8-303A	N/A		F.1	Lateral Bloc	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-32-8-31	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-335-8-UNK 1	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-35-8-36	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-53-8-54	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-55A-8-57	N/A		F.1	Lateral Bloc	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-59-8-58	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	8-64-8-63	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	8-64B-8-64A					0	5	0	0	0	5	5
		SUM of Reach	9-159-9-158					0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	9-234-9-233	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	9-235-9-235A	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	9-242-9-241	N/A		F.1	Connection	0	5	0	0	0	5	5
	Metro	Problem Laterals - Connections	9-259-9-251	N/A		F.1	Connection	0	5	0	0	0	5	5
	Metro	Problem Laterals - Connections	9-262C-9-262B	N/A		F.1	Connection	0	5	0	0	0	5	5
	Edmonds WWTP	Problem Laterals - Connections	9-266-9-267	N/A		F.1	Lateral Bloc	0	5	0	0	0	5	5
		SUM of Reach	9-270-9-308					0	5	0	0	0	5	5
		SUM of Reach	9-289-9-290					0	5	0	0	0	5	5
	Lift Station 1	Problem Laterals - Connections	9-36-9-37	N/A		F.1	Connection	0	5	0	0	0	5	5
		SUM of Reach	13-53-9-212					0	4	25	0	0	29	4
		SUM of Reach	9-224-9-202					10	4	10	0	0	24	4
		SUM of Reach	14-65-14-64					0	4	0	10	0	14	4
		SUM of Reach	7-50-7-52					0	4	10	0	0	14	4
		SUM of Reach	1-31-1-30					0	4	5	0	0	9	4
		SUM of Reach	14-7-14-7A					5	4	0	0	0	9	4
		SUM of Reach	7-38-7-36					0	4	5	0	0	9	4
		SUM of Reach	8-178A-8-177A					0	4	5	0	0	9	4
		SUM of Reach	8-30-8-29					0	4	5	0	0	9	4
		SUM of Reach	8-51-8-50					0	4	5	0	0	9	4
		SUM of Reach	14-7G-14-7F					0	4	0	4	0	8	4
		SUM of Reach	2-112-2-111					0	4	3	0	0	7	4
	Metro	Depressions in Pipe	10-25-10-26	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	11-14A-11-14					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	11-15-11-14	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	11-23C-11-21					0	4	0	0	0	4	4
		SUM of Reach	11-5-11-3					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-109A-12-111	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	12-140-12-139					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-149A-12-149	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-180-12-181	0		F.1	Sag	0	4	0	0	0	4	4
		SUM of Reach	12-182A-12-215					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-185F-12-185A	108		F.1	Water Level	0	4	0	0	0	4	4
		SUM of Reach	12-185G-12-185F					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-189-12-191	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-190-12-189	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	12-19-12-28					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-204-12-203	0		F.1	Sag	0	4	0	0	0	4	4
		SUM of Reach	12-250-12-249					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	12-26-12-24	0		F.1	Camera Und	0	4	0	0	0	4	4

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
	Edmonds WWTP	Depressions in Pipe	13-120-13-121	11		F.1	Sag	0	4	0	0	0	4	4
		SUM of Reach	13-22A-13-22B					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	13-36-13-35	5		F.1	Sag	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	13-39-13-37	12		F.1	Sag	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	13-4A-13-4	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	13-57-13-59	14		F.1	Sag	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	13-59-13-60			F.1	Sag	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-11-14-10	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-16-14-11			F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-21-14-4	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 12	Depressions in Pipe	1-43-1-24	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	14-35-14-34					0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-38-14-37	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-3E-14-3F	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-46-14-METER 3	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-48-14-50	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-49-14-49D	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	14-69-14-68	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	16-101-16-102	3		F.1	Sag	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	16-57-16-75	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-19-17-23	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-38-17-37	4		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-39-17-46	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-46-17-47	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-47-17-48	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-48-17-59	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-60-17-61	45		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	17-75-17-78					0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-77-17-78	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-84-17-85	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-85-17-86	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-86-17-87	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-87-17-88	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-88-17-89	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-95-17-94	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-96-17-95	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-97-17-96	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	17-98-17-97	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	2-113-2-112					0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	2-47-2-49	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	3-12-2-2	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	3-1D-3-2G					0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	3-23-3-24	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 12	Depressions in Pipe	3-2H-3-2I	24		F.1	Sag	0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	3-8-3-9	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	4-100-4-100A					0	4	0	0	0	4	4
		SUM of Reach	4-132-4-131					0	4	0	0	0	4	4
		SUM of Reach	4-163-4-162					0	4	0	0	0	4	4
	Lift Station 3	Depressions in Pipe	4-65-4-67	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 3	Depressions in Pipe	4-70A-4-71-LIFT 3	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	4-79-4-78	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	4-86-4-85					0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	5-144-5-145	1		F.1	Camera Und	0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	5-177-5-176	0		F.1	Camera Und	0	4	0	0	0	4	4

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
	Lynnwood WWTP	Depressions in Pipe	5-187-5-191	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	5-195A-5-196	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 9	Depressions in Pipe	5-283-5-288	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 9	Depressions in Pipe	5-300-5-301	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	5-321A-5-322	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lynnwood WWTP	Depressions in Pipe	5-322-5N-2	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 9	Depressions in Pipe	5-334A-5-334	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	7-23-7-53D	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	7-30C-7-30	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	7-32C-7-32D	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	7-47-7-50	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	7-48-7-47	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	8-123-8-120					0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	8-147-8-146	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	8-222B-8-222A	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	8-250-8-249					0	4	0	0	0	4	4
	Lift Station 2	Depressions in Pipe	8-296-8-297	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	8-29-8-43					0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	8-303D-8-303C	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	8-311-8-312					0	4	0	0	0	4	4
		SUM of Reach	8-321-7-72					0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	8-340-8-339	0		F.1	Sag	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	8-34-8-35	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	8-37-8-39	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	8-39A-8-41					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	8-49-8-53	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	8-81B-8-81					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	8-89-8-108	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	8-91-8-106	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	9-100-9-101	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	9-120-9-121	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	9-137-9-139	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-157-9-156	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	9-188-9-189					0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-193-9-196	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-19-9-18	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-201-9-202	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-202-9-20	0		F.1	Camera Und	0	4	0	0	0	4	4
	Metro	Depressions in Pipe	9-253-9-254	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-271-9-270	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-274A-9-274	15		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-279-9-278	16		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-319-9-319A	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-321-9-322	0		F.1	Camera Und	0	4	0	0	0	4	4
	Edmonds WWTP	Depressions in Pipe	9-346-9-347	0		F.1	Camera Und	0	4	0	0	0	4	4
	Lift Station 1	Depressions in Pipe	9-55A-9-55	0		F.1	Camera Und	0	4	0	0	0	4	4
		SUM of Reach	9-273A-9-273					0	3	5	0	0	8	3
		SUM of Reach	8-17-8-18					0	3	0	4	0	7	3
		SUM of Reach	12-243-12-241					0	3	3	0	0	6	3
		SUM of Reach	11-12-11-11					0	3	0	0	0	3	3
		SUM of Reach	12-78-12-77					0	3	0	0	0	3	3
		SUM of Reach	13-67-13-66					0	3	0	0	0	3	3
		SUM of Reach	13-8A-13-8B					0	3	0	0	0	3	3
		SUM of Reach	2-84-2-83					0	3	0	0	0	3	3

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
		SUM of Reach	3-109G-3-109F					0	3	0	0	0	3	3
		SUM of Reach	4-137-4-133					0	3	0	0	0	3	3
		SUM of Reach	4-140-4-139					0	3	0	0	0	3	3
		SUM of Reach	4-9-4-7					0	3	0	0	0	3	3
		SUM of Reach	5-278-5-271					0	3	0	0	0	3	3
		SUM of Reach	7-44A-8-331					0	3	0	0	0	3	3
		SUM of Reach	7-46A-7-46					0	3	0	0	0	3	3
		SUM of Reach	8-185-8-186					0	3	0	0	0	3	3
		SUM of Reach	8-244-8-243					0	3	0	0	0	3	3
		SUM of Reach	8-289-8-288					0	3	0	0	0	3	3
		SUM of Reach	8-41-8-42					0	3	0	0	0	3	3
		SUM of Reach	8-46-8-47					0	3	0	0	0	3	3
		SUM of Reach	8-86-8-112					0	3	0	0	0	3	3
		SUM of Reach	12-101-12-95					0	2	5	14	0	21	2
		SUM of Reach	8-68B-8-68					0	2	17	0	0	19	2
		SUM of Reach	12-134-12-132					0	2	14	0	0	16	2
		SUM of Reach	9-225-9-224					0	2	8	0	0	10	2
		SUM of Reach	5-122-5-121					0	2	0	6	0	8	2
		SUM of Reach	12-72-12-71					0	2	5	0	0	7	2
		SUM of Reach	8-331-8-330					0	2	5	0	0	7	2
		SUM of Reach	12-289-12-288A					0	2	3	0	0	5	2
		SUM of Reach	14-56-14-62					0	2	3	0	0	5	2
		SUM of Reach	5-148B-5-149					0	2	3	0	0	5	2
	Edmonds WWTP	Medium Root Problem	11-10-11-9B	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	11-14-11-13					0	2	0	0	0	2	2
		SUM of Reach	11-23B-11-21					0	2	0	0	0	2	2
	Edmonds WWTP	Medium Root Problem	12-153-12-150	0		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Problem Joint - Offset Medium	12-266-12-265	N/A		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Medium Root Problem	12-288-12-287	0		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Medium Root Problem	12-33-12-31	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	12-89-12-88					0	2	0	0	0	2	2
	Edmonds WWTP	Joint Gasket Exposed - Medium	13-100-13-98	N/A		F.1	Medium	0	2	0	0	0	2	2
	Edmonds WWTP	Medium Root Problem	13-112-13-114	0		F.1		0	2	0	0	0	2	2
	Metro	Medium Root Problem	13-8D-13-8C	0		F.1		0	2	0	0	0	2	2
	Metro	Medium Root Problem	13-9A-13-166A	0		F.1		0	2	0	0	0	2	2
	Metro	Medium Root Problem	14-44-14-43	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	16-108-16-109					0	2	0	0	0	2	2
	Metro	Problem Joint - Offset Medium	16-116-16-98	N/A		F.1		0	2	0	0	0	2	2
		SUM of Reach	17-15-17-16					0	2	0	0	0	2	2
	Metro	Medium Root Problem	17-44-17-46	0		F.1		0	2	0	0	0	2	2
	Lift Station 10	Medium Root Problem	2-109-2-108	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	2-31-2-32					0	2	0	0	0	2	2
	Lynnwood WWTP	Medium Root Problem	3-120-3N-4	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	3-121-3-120					0	2	0	0	0	2	2
		SUM of Reach	3-12H-3-12I					0	2	0	0	0	2	2
		SUM of Reach	3-2I-3-2J					0	2	0	0	0	2	2
	Lynnwood WWTP	Problem Joint - Offset Medium	3-60-3-68	N/A		F.1		0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	4-133-4-132	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	4-138-4-137					0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	4-143-4-150	0		F.1		0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	4-210-4-213A	0		F.1		0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	4-40-4-39	0		F.1		0	2	0	0	0	2	2
	Lift Station 3	Medium Root Problem	4-56-4-57	0		F.1		0	2	0	0	0	2	2
	Lynnwood WWTP	Medium Root Problem	5-149-5-150	0		F.1		0	2	0	0	0	2	2

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
		SUM of Reach	5-195-5-195A					0	2	0	0	0	2	2
	Lynnwood WWTP	Medium Root Problem	5-217-5-216	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	5-281A-5-278					0	2	0	0	0	2	2
	Lift Station 9	Medium Root Problem	5-317-5-316	0		F.1		0	2	0	0	0	2	2
	Lift Station 9	Medium Root Problem	5-330E-5-330D	0		F.1		0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	5-38-5-39	0		F.1		0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	5-79-5-70	0		F.1		0	2	0	0	0	2	2
	Lift Station 10	Medium Root Problem	5-88A-5-88B	0		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Problem Joint - Offset Medium	7-44-7-44A	N/A		F.1		0	2	0	0	0	2	2
		SUM of Reach	7-64-7-62					0	2	0	0	0	2	2
		SUM of Reach	7-86-7-87A					0	2	0	0	0	2	2
		SUM of Reach	8-101B-8-101A					0	2	0	0	0	2	2
		SUM of Reach	8-13-8-21A					0	2	0	0	0	2	2
		SUM of Reach	8-172J-8-172F					0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	8-178D-8-178C	0		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Problem Joint - Offset Medium	8-18A-8-18	N/A		F.1		0	2	0	0	0	2	2
		SUM of Reach	8-193-8-192					0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	8-196-8-196A	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	8-21-8-21A					0	2	0	0	0	2	2
		SUM of Reach	8-2-8-2A					0	2	0	0	0	2	2
		SUM of Reach	8-288-8-287					0	2	0	0	0	2	2
		SUM of Reach	8-2A-8-3					0	2	0	0	0	2	2
		SUM of Reach	8-316-8-135					0	2	0	0	0	2	2
		SUM of Reach	8-317-8-316					0	2	0	0	0	2	2
		SUM of Reach	8-324-7-68					0	2	0	0	0	2	2
		SUM of Reach	8-44-8-45					0	2	0	0	0	2	2
	Lift Station 1	Medium Root Problem	9-111-8-189D	0		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Problem Joint - Offset Medium	9-184-9-185	N/A		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Medium Root Problem	9-185-9-186	0		F.1		0	2	0	0	0	2	2
	Edmonds WWTP	Medium Root Problem	9-222A-9-227	0		F.1		0	2	0	0	0	2	2
		SUM of Reach	9-84-9-83					0	2	0	0	0	2	2
		SUM of Reach	2-113A-2-113					0	1	11	0	0	12	1
		SUM of Reach	3-12F-3-12E					0	1	0	10	0	11	1
		SUM of Reach	8-97-8-98					0	1	10	0	0	11	1
		SUM of Reach	8-85K-8-85F					0	1	6	0	0	7	1
		SUM of Reach	12-226-12-225					0	1	5	0	0	6	1
		SUM of Reach	12-71-12-89					0	1	5	0	0	6	1
		SUM of Reach	16-9-16-8					0	1	5	0	0	6	1
		SUM of Reach	3-131-3-132					0	1	5	0	0	6	1
		SUM of Reach	4-52-4-52A					0	1	5	0	0	6	1
		SUM of Reach	5-299-5-300					0	1	5	0	0	6	1
		SUM of Reach	8-281-8-282					0	1	5	0	0	6	1
		SUM of Reach	9-117-9-116					0	1	5	0	0	6	1
		SUM of Reach	9-264-9-266					0	1	5	0	0	6	1
		SUM of Reach	4-115-8-219H					0	1	0	4	0	5	1
		SUM of Reach	8-162-8-161					0	1	0	4	0	5	1
		SUM of Reach	13-8E-13-166A					0	1	3	0	0	4	1
		SUM of Reach	3-109H-3-109G					0	1	3	0	0	4	1
		SUM of Reach	4-141-4-142					0	1	3	0	0	4	1
		SUM of Reach	8-249-8-265					0	1	3	0	0	4	1
		SUM of Reach	9-276-9-277					0	1	3	0	0	4	1
Miscellaneous M	SE Corner of Hwy 99 and 224th St	Clean Flume	14			F.1		0	1	0	0	0	1	1
Miscellaneous M	22304 Hwy 99	Clean Flume	14			F.1		0	1	0	0	0	1	1

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
Miscellaneous M	Edmonds Way Robinhood Lanes	Brush Sensor	15			F.1		0	1	0	0	0	1	1
Miscellaneous M	244th and Hwy 99 - NW Corner	Clean Flume	16			F.1		0	1	0	0	0	1	1
Miscellaneous M	Denny's on SR 104 and Hwy 99	Clean Flume	17			F.1		0	1	0	0	0	1	1
Miscellaneous M	Old Ballinger Pump Station	Clean Flume	17			F.1		0	1	0	0	0	1	1
Miscellaneous M	East Side, NE Corner of Ballinger PS	Clean Flume	17			F.1		0	1	0	0	0	1	1
Miscellaneous M	Ballinger Golf Course at 74th Ave	Clean Flume	17			F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	11-19-11-18	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-108-12-109	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-12-12-13	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-151-12-22	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-163-12-162	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-165-12-164	0		F.1		0	1	0	0	0	1	1
		SUM of Reach	12-180A-12-180					0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-18-12-19	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Problem Joints - Offset	12-204I-12-204H			F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Problem Joints - Offset	12-204J-12-204I			F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Joint separated - Small	12-207-12-206	N/A		F.1	Small	0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-217-12-216	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-22-12-20	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-234B-12-234A	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-284F-12-284	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	12-70-12-69	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Roots	12-84-12-84A	42		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	13-133-13-134	0		F.1		0	1	0	0	0	1	1
	Metro	Roots	13-139-13-142	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Problem Joint - Offset Small	13-55-13-56	N/A		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	13-8-13-8B	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	13-89-9-11	0		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	14-33-14-32	0		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	14-7C-14-7A	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	15-1C-15-2	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Roots	15-3A-15-2A	0		F.1		0	1	0	0	0	1	1
	Metro	Joint separated - Small	16-115-16-116	N/A		F.1	Small	0	1	0	0	0	1	1
	Metro	Light Root Problem	16-32-16-33	0		F.1		0	1	0	0	0	1	1
		SUM of Reach	16-33-16-36					0	1	0	0	0	1	1
	Metro	Light Root Problem	16-4-16-3	0		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	16-46-16-47	0		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	16-54-16-57	0		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	16-91-16-103	0		F.1		0	1	0	0	0	1	1
	Metro	Roots	17-24-17-25	0		F.1		0	1	0	0	0	1	1
	Metro	Roots	17-25-17-26	0		F.1		0	1	0	0	0	1	1
	Metro	Roots	17-55-17-58	0		F.1		0	1	0	0	0	1	1
	Metro	Roots	17-57-17-58	0		F.1		0	1	0	0	0	1	1
	Lift Station 10	Problem Joint - Offset Small	2-111-2-110	N/A		F.1		0	1	0	0	0	1	1
	Lift Station 4	Roots	2-90-2-89	0		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Light Root Problem	3-133-3-134	0		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Problem Joint - Offset Small	3-140-3-137	N/A		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Problem Joint - Offset Small	3-162-3-163	N/A		F.1		0	1	0	0	0	1	1

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
	Lynnwood WWTP	Light Root Problem	3-63-3-64	0		F.1		0	1	0	0	0	1	1
	Lift Station 12	Problem Joint - Offset Small	3-8F-3-8A	N/A		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	4-109-4-108	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	4-115-8-219H	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	4-145-4-143	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	4-170-4-171	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	4-186A-4-186	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	4-212-4-213	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	4-221-4-220	0		F.1		0	1	0	0	0	1	1
	Lift Station 3	Light Root Problem	4-45-4-46	0		F.1		0	1	0	0	0	1	1
	Lift Station 3	Light Root Problem	4-46-4-47	0		F.1		0	1	0	0	0	1	1
	Lift Station 3	Light Root Problem	4-69A-4-70	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	5-118C-5-118B	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	5-123-4-186A	0		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Light Root Problem	5-13-5-12	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	5-141A-5-141	0		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Light Root Problem	5-194-5-195	0		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Light Root Problem	5-218-5-210	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	5-252A-5-252B	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	5-264-5-263	0		F.1		0	1	0	0	0	1	1
	Lift Station 9	Light Root Problem	5-299-5-300	0		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Roots	5-324A-5N-3	0		F.1		0	1	0	0	0	1	1
	Lift Station 9	Light Root Problem	5-330-5-329	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	5-344-5-345	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Roots	5-52-5-51	0		F.1		0	1	0	0	0	1	1
	Lynnwood WWTP	Light Root Problem	5-75-5-74	0		F.1		0	1	0	0	0	1	1
	Lift Station 10	Roots	5-88B-5-88C	0		F.1		0	1	0	0	0	1	1
	Lift Station 10	Light Root Problem	5-89-5-99	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	7-62-7-61	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	7-82-7-83	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	7-85-7-86	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-102-8-101	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-137-8-292A	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-152-8-150	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-172K-8-172G	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-177-8-176	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-187A-8-187	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-188A-8-188C	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Roots	8-189B-8-189A	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-209-8-210	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-219A-8-219C	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-239-8-238	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Roots	8-246-8-247	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-254-8-253	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Joint Separated	8-263-8-252	N/A		F.1		0	1	0	0	0	1	1
	Lift Station 1	Problem Joint - Offset Small	8-273-8-272	N/A		F.1		0	1	0	0	0	1	1
	Lift Station 2	Light Root Problem	8-294-8-295	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-323-8-321	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	8-69-8-70	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	8-95-8-96	0		F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	9-134-9-136	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	9-177-9-158A	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	9-225B-9-225	0		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Problem Joint - Offset Small	9-235A-9-235B	N/A		F.1		0	1	0	0	0	1	1

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
	Edmonds WWTP	Problem Joint - Offset Small	9-235B-9-217	N/A		F.1		0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	9-237-9-236	0		F.1		0	1	0	0	0	1	1
		SUM of Reach	9-273C-9-273B					0	1	0	0	0	1	1
	Edmonds WWTP	Light Root Problem	9-360-9-346	6		F.1		0	1	0	0	0	1	1
	Lift Station 1	Problem Joints - Offset	9-44-9-43			F.1		0	1	0	0	0	1	1
	Lift Station 1	Light Root Problem	9-85-9-86	0		F.1		0	1	0	0	0	1	1
	Metro	Light Root Problem	INLET-13-167	0		F.1		0	1	0	0	0	1	1
	Lake Ballinger Way and 205th	Clean Flume				F.1		0	1	0	0	0	1	1
		SUM of Reach	8-75-8-57					0	0	38	0	0	38	0
		SUM of Reach	12-75-8-14					0	0	0	28	0	28	0
		SUM of Reach	1-46-1-45					0	0	0	0	0	20	0
		SUM of Reach	1-55-1-52					0	0	0	20	0	20	0
		SUM of Reach	12-49-12-50					0	0	8	10	0	18	0
		SUM of Reach	13-22-13-22A					0	0	18	0	0	18	0
		SUM of Reach	12N-79-13-65B					0	0	3	14	0	17	0
		SUM of Reach	12-126-12-125					0	0	15	0	0	15	0
		SUM of Reach	12-132-12-131					0	0	14	0	0	14	0
		SUM of Reach	12-248-12-247					0	0	13	0	0	13	0
		SUM of Reach	14-3-14-3A					0	0	9	3	0	12	0
BREACH	Edmonds WWTP	Hole in Pipe - Large	12-105M-12-105K	1		F.3		0	0	0	10	0	10	0
		SUM of Reach	12-106-12-107					0	0	10	0	0	10	0
		SUM of Reach	12-107-12-108					0	0	10	0	0	10	0
		SUM of Reach	12-128-12-127					0	0	10	0	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	12-181-12-182	0		F.3		0	0	0	10	0	10	0
		SUM of Reach	12-185D-12-130					0	0	10	0	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	12-42-12-43	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	12-57-12-58	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	12-71-12-73	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	12-73-12-75	0		F.3		0	0	0	10	0	10	0
		SUM of Reach	12-93-12-90					0	0	10	0	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	13-65A-12-7	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Metro	Pipe Repair	14-73-14-72	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	16-128-16-129	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	16-133-16-134	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Metro	Pipe Repair	16-27-16-31	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Lift Station 12	Pipe Repair	1-79-1-78	8		F.3		0	0	0	10	0	10	0
BREACH	Lift Station 4	Hole in Pipe - Large	2-64B-2-68	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Lynnwood WWTP	Pipe Repair	3-65-3-66A	0		F.3		0	0	0	10	0	10	0
PIPE REPAIR	Edmonds WWTP	Pipe Repair	7-39B-7-39C	0		F.3		0	0	0	10	0	10	0
		SUM of Reach	7-76-7-75					0	0	10	0	0	10	0
		SUM of Reach	7-77-7-76					0	0	10	0	0	10	0
		SUM of Reach	8-243-8-242					0	0	10	0	0	10	0
		SUM of Reach	8-280-8-281					0	0	10	0	0	10	0
		SUM of Reach	8-287-8-286					0	0	10	0	0	10	0
		SUM of Reach	8-303B-8-303D					0	0	10	0	0	10	0
PIPE REPAIR	Storm Lines	Pipe Repair	8-322	0		F.3		0	0	0	10	0	10	0
		SUM of Reach	8-98-8-99					0	0	10	0	0	10	0
BREACH	Metro	Hole in Pipe - Medium	10-3-10-4	0	MEDIUM	F.2		0	0	9	0	0	9	0
BREACH	Lift Station 12	Hole in Pipe - Medium	1-16-1-20	0	MEDIUM	F.2		0	0	9	0	0	9	0
BREACH	Lift Station 1	Hole in Pipe - Medium	8-245A-8-245	0	MEDIUM	F.2		0	0	9	0	0	9	0
BREACH	Edmonds WWTP	Hole in Pipe - Medium	9-301-9-300	0	MEDIUM	F.2		0	0	9	0	0	9	0
		SUM of Reach	9-59-9-60					0	0	5	4	0	9	0
		SUM of Reach	12-102-12-101					0	0	0	0	0	8	0
BREACH	Edmonds WWTP	Hole in Pipe - Small	12-200-12-112	0	SMALL	F.2		0	0	8	0	0	8	0

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
		SUM of Reach	12-51-8-11					0	0	5	3	0	8	0
BREACH	Lift Station 4	Hole in Pipe - Small	2-89-2-88	0	SMALL	F.2		0	0	8	0	0	8	0
BREACH	Lift Station 1	Hole in Pipe - Small	4-186-4-185	0	SMALL	F.2		0	0	8	0	0	8	0
BREACH	Lift Station 1	Hole in Pipe - Small	5-269-5-267	0	SMALL	F.2		0	0	8	0	0	8	0
BREACH	Lift Station 1	Hole in Pipe - Small	8-202-8-201	0	SMALL	F.2		0	0	8	0	0	8	0
BREACH	Lift Station 1	Hole in Pipe - Small	9-80A-9-80	0	SMALL	F.2		0	0	8	0	0	8	0
BREACH	Edmonds WWTP	Hole in Pipe - Small	INLET-7-61	0	SMALL	F.2		0	0	8	0	0	8	0
BREACH	Lift Station 12	Deformed	1-11-1-15	0		F.3		0	0	0	7	0	7	0
		SUM of Reach	12-105N-12-105M					0	0	0	6	0	6	0
		SUM of Reach	13-113-13-112					0	0	6	0	0	6	0
		SUM of Reach	4-52A-4-53					0	0	0	6	0	6	0
		SUM of Reach	5-246-5-245					0	0	0	0	0	6	0
		SUM of Reach	8-175-8-174					0	0	3	3	0	6	0
	1048 Walnut Street	Grit (a lot)	8-2A-8-2	205	Conc	F.1		6	0	0	0	0	6	0
		SUM of Reach	8-2D-8-2B					0	0	6	0	0	6	0
	942 Alder Street	Grit (a lot)	8-30-8-31	275	Conc	F.1		6	0	0	0	0	6	0
	10th at Alder Street	Grit (a lot)	8-31-8-32	336	Conc	F.1		6	0	0	0	0	6	0
	Alder St at Yost Park	Grit (a lot)	8-328-8-2	265	Conc	F.1		6	0	0	0	0	6	0
	1053 Alder Street	Grit (a lot)	8-32A-8-32B	55	Conc	F.1		6	0	0	0	0	6	0
	10th Ave South at Walnut St	Grit (a lot)	8-4-8-3	335	Conc	F.1		6	0	0	0	0	6	0
	935 Walnut Street	Grit (a lot)	8-5-8-4	260	Conc	F.1		6	0	0	0	0	6	0
	8620 Maplewood Lane	Grit (a lot)	9-139-9-137	155	Conc	F.1		6	0	0	0	0	6	0
BREACH	Metro	Crack	10-10-10-7	1	Multiple - Narrow	F.2		0	0	5	0	0	5	0
	7122 210th Street	Grease	10-23-10-25	283	Conc	F.1		5	0	0	0		5	0
		SUM of Reach	11-1-11-2					0	0	5	0	0	5	0
BREACH	Edmonds WWTP	Crack	11-1A-7-39A	0	Circular - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Edmonds WWTP	Crack	11-3-11-2	0	Circular - Narrow	F.2		0	0	5	0	0	5	0
	9223 216th Street	Black Water	12-156-13-96	380	Conc	F.1		5	0	0	0	0	5	0
	1153 8th Ave S.	Grit, Black Water	12-189-12-190 c/o	120	Conc	F.1		5	0	0	0	0	5	0
	1115 8th Ave S.	Grit, Black Water	12-191-12-189	285	Conc	F.1		5	0	0	0	0	5	0
	736 Fir Street	Black Water	12-192-12-191	200	Conc	F.1		5	0	0	0	0	5	0
BREACH	Edmonds WWTP	Crack	12-196-12-198	1	Multiple - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Edmonds WWTP	Crack	12-24-12-23	2	Multiple - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Edmonds WWTP	Crack	12-249-12-248	0	Multiple - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Edmonds WWTP	Crack	12-37-12-38	0	Longitudinal - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Edmonds WWTP	Crack	12-55-12-56	0	Longitudinal - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Edmonds WWTP	Crack	12-8-12-6	1	Longitudinal - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Metro	Crack	13-20-13-15	0	Longitudinal - Wider	F.2		0	0	5	0	0	5	0
	16131 75th Place West	Grease	1-36-1-36A	211	PVC	F.1		5	0	0	0	0	5	0
	21808 Highway 99	Black Water	14-22-14-24	360	Conc	F.1		5	0	0	0	0	5	0
	21309 76th Ave W (Drop MH)	Grit, Black Water	14-40-9-254	330	Conc	F.1		5	0	0	0	0	5	0
	215th At 72nd	Black Water	14-6-14-7	260	Conc	F.1		5	0	0	0	0	5	0
	74th at 228th St	Grease	14-65-14-66	320	Conc	F.1		5	0	0	0	0	5	0
	72nd Ave W. at 215th St	Black Water	14-7A-14-7B	255	Conc	F.1		5	0	0	0	0	5	0
BREACH	Metro	Crack	16-103-16-106	1	Circular - Narrow	F.2		0	0	5	0	0	5	0
	240th at 78th Ave W	Black Water	16-76-16-77	160	Conc	F.1		5	0	0	0	0	5	0
	240th St and 78th Ave W	Grit, Black Water	16-77-16-65	275	Conc	F.1		5	0	0	0	0	5	0
BREACH	Metro	Crack	17-31-17-28	1	Longitudinal - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Metro	Crack	17-63-17-64	0	Multiple - Narrow	F.2		0	0	5	0	0	5	0
	23819 76th Ave W	Black Water	17-72-Main	44	Conc	F.1		5	0	0	0	0	5	0
	23821 76th Ave	Grease	17-73-17-69	232	Conc	F.1		5	0	0	0	0	5	0
BREACH	Metro	Crack	17-78-17-82	0	Longitudinal - Wider	F.2		0	0	5	0	0	5	0
	76th Ave W. at 242nd St	Black Water	17-81-17-80	360	Conc	F.1		5	0	0	0	0	5	0
	24122 76th Ave W	Black Water	17-82-17-81	105	Conc	F.1		5	0	0	0	0	5	0

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
BREACH	Lift Station 4	Crack	2-83-2-82	0	Longitudinal - Wider	F.2		0	0	5	0	0	5	0
BREACH	Lynnwood WWTP	Crack	3-109B-3-109A	0	Circular - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Lynnwood WWTP	Crack	3-1H-3-3A2	0	Circular - Narrow	F.2		0	0	5	0	0	5	0
	7117 176th St. SW	Dirt, Grease, Grit	3-93-3-94	150	Conc	F.1		5	0	0	0	0	5	0
BREACH	Lift Station 1	Crack	4-124-4-123	0	Circular - Wider	F.2		0	0	5	0	0	5	0
BREACH	Lift Station 1	Crack	4-217A-4-217	0	Longitudinal - Narrow	F.2		0	0	5	0	0	5	0
	Dellwood Dr. at 78th Ave W	Black Water	5-191-5-187	200	Conc	F.1		5	0	0	0	0	5	0
BREACH	Lift Station 1	Crack	5-263-5-262	1	Multiple - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Lift Station 9	Crack	5-299-5-300	1	Multiple - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Lynnwood WWTP	Crack	5-319-5-320	0	Circular - Narrow	F.2		0	0	5	0	0	5	0
	7601 OVD Post Office	Grit	5-325-5-328	350	Conc	F.1		5	0	0	0	0	5	0
	18209 76th Ave West	Grit	5-325-5-511-11	80	Conc	F.1		5	0	0	0	0	5	0
	Admiral Way at Dayton	Grease	7-11-7-10	80	Conc	F.1		5	0	0	0	0	5	0
	Admiral Way	Grease	7-3-7-2	425	Conc	F.1		5	0	0	0	0	5	0
	Admiral Way	Grease	7-4-7-3	380	Conc	F.1		5	0	0	0	0	5	0
	Admiral Way	Grease	7-5-7-4	380	Conc	F.1		5	0	0	0	0	5	0
	Admiral Way	Grease	7-6-7-5	280	Conc	F.1		5	0	0	0	0	5	0
	Admiral Way at West Dayton	Grit	7-6-CO	125	Conc	F.1		5	0	0	0	0	5	0
BREACH	Lift Station 1	Crack	7-75-7-74	1	Multiple - Narrow	F.2		0	0	5	0	0	5	0
	Admiral Way at Dayton	Grease	7-7-7-11	37	Conc	F.1		5	0	0	0	0	5	0
	Admiral Way	Grease	7-7-7-6	35	Conc	F.1		5	0	0	0	0	5	0
BREACH	Lift Station 1	Crack	8-189-8-194	0	Spiral - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Lift Station 1	Crack	8-206-8-205	0	Longitudinal - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Lift Station 1	Crack	8-219H-8-219G	0	Multiple - Narrow	F.2		0	0	5	0	0	5	0
BREACH	Lift Station 1	Crack	8-286-8-285	0	Multiple - Narrow	F.2		0	0	5	0	0	5	0
	1033 Walnut Street	Grit	8-3-8-2A	130	Conc	F.1		5	0	0	0	0	5	0
BREACH	Edmonds WWTP	Crack	8-74-8-75	4	Multiple - Narrow	F.2		0	0	5	0	0	5	0
	7th Ave at Edmonds St	Black Water	8-99-8-101A	207	Conc	F.1		5	0	0	0	0	5	0
PROBLEM JOINTS	Lift Station 1	Infiltration in the Joint	9-136-9-136A	N/A	Medium	F.2		0	0	5	0	0	5	0
	8705 Maplewood Lane	Grit, Black Water	9-137-9-138	340	Conc	F.1		5	0	0	0	0	5	0
	8610 Main Street	Grit	9-16-9-19	178	Conc	F.1		5	0	0	0	0	5	0
PROBLEM JOINTS	Lift Station 1	Infiltration in the Joint	9-170-9-172	N/A	Light	F.2		0	0	5	0	0	5	0
	8610 Main Street	Black Water	9-19-9-20	56	Conc	F.1		5	0	0	0	0	5	0
	Pine Ridge Park	Black Water	9-202-9-201+	165	Conc	F.1		5	0	0	0	0	5	0
	Bpind Ridge Park	Black Water	9-202-9-224	503	Conc	F.1		5	0	0	0	0	5	0
	Pine Ridge Park	Black Water	9-20-9-202	430	Conc	F.1		5	0	0	0	0	5	0
	76th at 212th Street S.W.	Grease	9-254-9-255	305	Conc	F.1		5	0	0	0	0	5	0
BREACH	Edmonds WWTP	Crack	9-274-9-275	0	Circular - Narrow	F.2		0	0	5	0	0	5	0
	7703 203 Street SW	Grit	9-314-9-313	310	Conc	F.1		5	0	0	0	0	5	0
BREACH	Lift Station 9	Crack	9-326-9-327	1	Longitudinal - Narrow	F.2		0	0	5	0	0	5	0
	7804 200th Street	Black Water	9-347-9-346	130	Conc	F.1		5	0	0	0	0	5	0
	7907 200th Street (Drop MH)	Black Water	9-348-9-347	400	Conc	F.1		5	0	0	0	0	5	0
	7726 202 Place	Grit, Black Water	9-366-9-314	350	Conc	F.1		5	0	0	0	0	5	0
BREACH	Edmonds WWTP	Broken Hole	12-178-12-179	0		F.3		0	0	0	4	0	4	0
BREACH	Edmonds WWTP	Broken	12-212-12-211	0		F.3		0	0	0	4	0	4	0
BREACH	Edmonds WWTP	Broken	12-269C-12-269D	0	Soil Visible - Large	F.3		0	0	0	4	0	4	0
BREACH	Metro	Broken	13-14-13-13	0		F.3		0	0	0	4	0	4	0
BREACH	Metro	Broken	14-28-14-27	0	Soil Visible - Large	F.3		0	0	0	4	0	4	0
BREACH	Edmonds WWTP	Broken	15-4E-15-4C	0	Soil Visible - Small	F.3		0	0	0	4	0	4	0
BREACH	Lift Station 3	Broken Hole	4-75-4-74	0		F.3		0	0	0	4	0	4	0
BREACH	Edmonds WWTP	Broken Hole	7-39C-7-40	0		F.3		0	0	0	4	0	4	0
BREACH	Edmonds WWTP	Broken	8-22-8-21	0	Soil Visible - Medium	F.3		0	0	0	4	0	4	0

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
BREACH	Edmonds WWTP	Broken	8-337-8-336A	0	Soil Visible - Medium	F.3		0	0	0	4	0	4	0
BREACH	Lift Station 1	Broken	8-351-8-350	0	Void Visible - Medium	F.3		0	0	0	4	0	4	0
ROOTS	Metro	Heavy Root Problem	10-19-10-19B	0		F.2		0	0	3	0	0	3	0
ROOTS	Edmonds WWTP	Heavy Root Problem	12-159-12-160	0		F.2		0	0	3	0	0	3	0
ROOTS	Edmonds WWTP	Heavy Root Problem	12-293-12-293A	0		F.2		0	0	3	0	0	3	0
ROOTS	Edmonds WWTP	Heavy Root Problem	13-63B-13-63C	0		F.2		0	0	3	0	0	3	0
		SUM of Reach	14-19-14-18					0	0	3	0	0	3	0
		SUM of Reach	15-1B-15-1C					0	0	3	0	0	3	0
ROOTS	Edmonds WWTP	Heavy Root Problem	15-3B-15-3A	0		F.2		0	0	3	0	0	3	0
ROOTS	Metro	Heavy Root Problem	16-25-16-26	0		F.2		0	0	3	0	0	3	0
ROOTS	Lift Station 10	Heavy Root Problem	2-113E-2-113	1		F.2		0	0	3	0	0	3	0
ROOTS	Lynnwood WWTP	Heavy Root Problem	3-103-3-105	0		F.2		0	0	3	0	0	3	0
PROBLEM JOINTS	Lynnwood WWTP	Joint Offset - Large	3-66A-3-66	N/A	Large	F.3		0	0	0	3	0	3	0
ROOTS	Lynnwood WWTP	Heavy Root Problem	3-84A-3-85	0		F.2		0	0	3	0	0	3	0
ROOTS	Lift Station 1	Heavy Root Problem	4-144-4-145	0		F.2		0	0	3	0	0	3	0
PROBLEM JOINTS	Lift Station 10	Joint separated - Large	4-3-2-113B	N/A		F.2		0	0	3	0	0	3	0
ROOTS	Lift Station 1	Heavy Root Problem	5-30-5-28	0		F.2		0	0	3	0	0	3	0
ROOTS	Lift Station 1	Heavy Root Problem	5-37-5-38	0		F.2		0	0	3	0	0	3	0
PROBLEM JOINTS	Lift Station 7	Joint Offset - Large	7-11-7-7	N/A	Large	F.3		0	0	0	3	0	3	0
ROOTS	Lift Station 1	Heavy Root Problem	8-207-8-206	0		F.2		0	0	3	0	0	3	0
PROBLEM JOINTS	Lift Station 1	Joint separated - Large	8-346-8-343	N/A		F.2		0	0	3	0	0	3	0
		SUM of Reach	9-181-9-182					0	0	0	3	0	3	0
ROOTS	Lift Station 9	Heavy Root Problem	9-341-9-340A	0		F.2		0	0	3	0	0	3	0
ROOTS	Lift Station 9	Heavy Root Problem	9-342-9-341	0		F.2		0	0	3	0	0	3	0
PROBLEM JOINTS	Edmonds WWTP	Joint Offset - Large	9-349-9-350	N/A	Large	F.3		0	0	0	3	0	3	0
		SUM of Reach	10-4-10-5					0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	11-18-7-33	N/A		F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	12-100-12-99	N/A		F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	12-10-12-11	N/A		F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	12-144-12-146	N/A		F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	12-177-12-176	N/A		F.1		0	0	0	0	0	0	0
		SUM of Reach	12-292-12-293					0	0	0	0	0	0	0
	Metro	Debris and Deposits	13-23B-9-250	N/A		F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	13-47-13-46	N/A		F.1		0	0	0	0	0	0	0
	9126 Bowdoin	N/A	13-C/O	C/O	PVC	F.1		0	0	0	0	0	0	0
	Lift Station 12	Debris and Deposits	1-51-1-50	N/A		F.1		0	0	0	0	0	0	0
	Lift Station 12	Debris and Deposits	1-57-1-56	N/A		F.1		0	0	0	0	0	0	0
	Metro	Debris and Deposits	16-39-16-40	N/A		F.1		0	0	0	0	0	0	0
	240th At Highway 99	None	16-60-16-59	330	Conc	F.1		0	0	0	0	0	0	0
	Metro	Debris and Deposits	16-65-16-77	N/A		F.1		0	0	0	0	0	0	0
	Lift Station 12	Debris and Deposits	1-67-1-66	N/A		F.1		0	0	0	0	0	0	0
	Metro	Debris and Deposits	16-82-16-83	N/A		F.1		0	0	0	0	0	0	0
	Metro	Debris and Deposits	16-95-16-96	N/A		F.1		0	0	0	0	0	0	0
	Metro	Debris and Deposits	17-43-17-42	N/A		F.1		0	0	0	0	0	0	0
PIPE REPAIR	Lift Station 12	Pipe Repair	1-75-1-74	4		F.3		0	0	0	0	0	0	0
	Lynnwood WWTP	Debris and Deposits	2-11-2-10	N/A		F.1		0	0	0	0	0	0	0
	Lift Station 4	Debris and Deposits	2-62-2-63	N/A		F.1		0	0	0	0	0	0	0
	Lynnwood WWTP	Joint Gasket Exposed - Light	3-89-3-72	N/A		F.1	Light	0	0	0	0	0	0	0
	Lift Station 1	Debris and Deposits	4-135-4-136	N/A		F.1		0	0	0	0	0	0	0

Table F.8 Composite Capital Improvement Projects - Granite O&M Only								Ranking and Point Assignment						
Problem Category	Location	Reason	Manhole #	Distance of Run (ft)	Comments	Table	CIP No.	Red Area	Granite O&M	Granite - Trechless	Granite - Dig up and Replace	Capacity	TOTAL	Granite O&M
	Lift Station 1	Debris and Deposits	4-34-4-36	N/A		F.1		0	0	0	0	0	0	0
	Lift Station 1	Debris and Deposits	4-39-4-41	N/A		F.1		0	0	0	0	0	0	0
		SUM of Reach	4-72A-4-72					0	0	0	0	0	0	0
	Lift Station 1	Debris and Deposits	4-83-4-82	N/A		F.1		0	0	0	0	0	0	0
	Lift Station 1	Debris and Deposits	4-98-4-97	N/A		F.1		0	0	0	0	0	0	0
	Lynnwood WWTP	Debris and Deposits	5-164-5-163	N/A		F.1		0	0	0	0	0	0	0
	8015 196th St SW		5-334A CO to main	60	PVC	F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	7-33-7-32	N/A		F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	7-39A-7-39B	N/A		F.1		0	0	0	0	0	0	0
	Lift Station 1	Debris and Deposits	8-291B-8-291A	N/A		F.1		0	0	0	0	0	0	0
	7th Ave at Sprague St	None	8-316-8-99	290	Conc	F.1		0	0	0	0	0	0	0
	7th at Edmonds St	None	8-99-8-98	102	Conc	F.1		0	0	0	0	0	0	0
	Metro	Debris and Deposits	9-247-9-248	N/A		F.1		0	0	0	0	0	0	0
	Edmonds WWTP	Debris and Deposits	9-272-9-271	N/A		F.1		0	0	0	0	0	0	0
	Lift Station 1	Debris and Deposits	9-62-9-61	N/A		F.1		0	0	0	0	0	0	0

APPENDIX G

Sewer Service Agreements

G.1 Agreement for Wastewater Treatment, Disposal and Transport services – City of Edmonds, City of Mountlake Terrace and Olympic View Water and Sewer District – May 17, 1988

G.2 Agreement between City of Edmonds and Municipality of Seattle – July 20, 1988

G.3 Agreement between City of Edmonds and King County – October 6, 2000

G.4 Agreement between City of Edmonds and City of Lynnwood – October 26, 1982

G.5 Agreement between City of Edmonds and City of Lynnwood – November 19, 1987

G.6 Agreement between City of Edmonds and City of Lynnwood – May 4, 1990

G.7 Agreement between City of Edmonds and City of Lynnwood – August 15, 2011

G.1 Agreement for Wastewater Treatment, Disposal and Transport services – City of Edmonds, City of Mountlake Terrace and Olympic View Water and Sewer District – May 17, 1988

AGREEMENT FOR WASTEWATER TREATMENT, DISPOSAL AND TRANSPORT SERVICES

By and Among

THE CITY OF EDMONDS

THE CITY OF MOUNTLAKE TERRACE

OLYMPIC VIEW WATER AND SEWER DISTRICT

AND

RONALD SEWER DISTRICT

May 17, 1988

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AGREEMENT FOR WASTEWATER TREATMENT, DISPOSAL, AND TRANSPORT SERVICES

THIS AGREEMENT is effective as of the 17th day of May, 1988, by and among the City of Mountlake Terrace, Olympic View Water and Sewer District, and Ronald Sewer District (the "Participants"), and the CITY OF EDMONDS (the "City") (collectively, the "Parties"), all municipal corporations of the State of Washington.

WHEREAS, the City's wastewater treatment and disposal facilities (the "Facilities") are being upgraded to meet the discharge limitations of the City's current National Pollutant Discharge Elimination System waste discharge permit; and

WHEREAS, the City must improve the Facilities so that they will be in compliance with applicable federal, state, and local laws and regulations; and

WHEREAS, the State of Washington has enforced both Federal and State statutes and in 1985 issued a Compliance Order and a Compliance Schedule to the City for the construction of secondary treatment facilities; and

WHEREAS, the City desires to expand the capacity of the Facilities at the 2nd Avenue and Dayton Street site in order to meet current domestic wastewater treatment needs of various public entities located

in or near the City (collectively, the "Participants") and to provide projected ultimate treatment capacity for the City and the Participants as defined under "Allocated Capacity;" and

WHEREAS, the Participants wish the City to assume the ownership and operation of certain transmission, metering, and pumping facilities, which are used jointly by some or all of the Participants and the City; and

WHEREAS, the Participant is one of several Participants served by the Facilities, and the Participant is to equitably share in the financing of the necessary improvements to the Facilities provided that the City reserves a portion of the capacity of the improved Facilities for the treatment of domestic wastewater from the Participant's service area; and

WHEREAS, The City desires to plan and provide for the long-term capital and operational needs of the Facilities, which may include mandated technological and regulatory changes and increased capacity and space demands; and

WHEREAS the Participants desire to be kept informed prior to and during the construction of improvements; to provide for a method of overseeing construction, operation, maintenance, and expansion of the facilities; and to provide a procedure for reviewing and commenting upon the Treatment Plant annual budgets; and

WHEREAS, the City and the Participants desire to provide for an integrated Industrial Pretreatment program within their respective service areas as required by DOE and/or EPA; and

WHEREAS, The City and the Participants executed a Memorandum of Understanding in 1987 setting forth a number of principles and expressing their intent to enter into this Agreement;

NOW, THEREFORE, in consideration of the foregoing and the mutual promises provided for herein, the Parties hereto for themselves, their assigns and successors in interest, agree as follows:

Section 1. Definitions. For the purpose of this Agreement, the following words shall have the following meanings unless another meaning is clearly intended:

1.1. "AADF" means annual average daily flow, and shall mean the total flow of domestic sewage in millions of gallons during a full calendar year divided by the number of days in such year, expressed in MGD.

1.2. "Allocated Capacity of Domestic Sewage" means the maximum annual average daily flow (AADF) of Domestic Sewage that the Participant is authorized by this Agreement to transmit to the Facilities, measured in volume. Volume shall be measured by metered Domestic Sewage flow expressed in MGDs of AADF. A substitute for direct metering is to be used where co-mingled flows for small

numbers of users (under approximately 100 ECU's) described in Section 6.5 make direct measurement impractical.

1.3. "Capacity Limit" means the preceding 12 month AADF of any Party when it equals the Party's Allocated Capacity of Domestic Sewage.

1.4. "City" means the City of Edmonds or its successor.

1.5. "Customer" means a "single family residence" and/or an "equivalent customer unit" (ECU), as defined below.

1.6. "DOE" means the Washington State Department of Ecology, or its successor.

1.7. "Domestic Sewage" means sanitary wastes normally collected from residential establishments, and shall include commercial and industrial wastes of similar strength or quality, and other commercial and/or industrial wastes that are pre-treated in accordance with City and/or Participant requirements meeting DOE and EPA guidelines. Domestic Sewage shall exclude ground water, storm water, drain water and industrial wastes not pre-treated in accordance with City and/Participant requirements meeting DOE and EPA guidelines.

1.8. "EPA" means the United States Environmental Protection Agency, or its successor.

1.9. "Equivalent Customer" Unit or "ECU" is a measure applied to a user of the sewerage system other than "single family residence." The number of Equivalent Customer Units assigned to any such user (for example, an apartment house, motel, school, hospital, nursing home, and any other public or commercial establishment) shall be the numerical ratio of the monthly volume of wastewater contributed by such user to the monthly volume of wastewater contributed by a typical single family residence. To serve as a practicable basis for computing the number of ECU's contributing into the joint sewerage system -- when and if such a computation is necessary or desirable to either augment or replace a direct flow measurement -- a list of users and the corresponding "equivalent customer" ratings is attached in Exhibit D, and incorporated herein by reference.

1.10. "Facilities" means the City's wastewater treatment facilities as described in the City of Edmonds Engineering Report, dated September, 1986, as amended, and includes the effluent transmission pipe used by all Participants (Edmonds Way Trunk), the outfall, the diffuser, and, upon the completion of the Project, the Improvements.

1.11. "Flow" means the volume of sewage per unit of time.

1.12. "Improvements" means those improvements to the Facilities described in the City of Edmonds Facilities Plan, dated January, 1988, as amended, or engineering plans and specifications approved by DOE, EPA, and the City, all of which are incorporated herein by this reference, and approved change orders carried out in

accordance with the construction of the facilities required under this Agreement.

1.13. "Influent Point" means the point at which each Participant's Internal System connects to the Facilities.

1.14. "Internal System" means all sewer lines, pump stations and other sewer facilities upstream from the Influent Point owned and operated by each Participant, respectively.

1.15. "MGD" means million gallons per day, referring to a rate of sewage flow.

1.16. "Maintenance and Operation Costs" means all direct costs and expenses incurred by the City in transporting and treating Domestic Sewage through the Facilities, maintaining those Facilities, and administering a joint Industrial Pre-Treatment program. Maintenance and Operation costs are described in Exhibit B, attached hereto and incorporated herein by this reference .

1.17. "Memorandum of Understanding" means the agreement of that name between the City and the Participants executed in September, October and November, 1987, attached as Exhibit C and incorporated herein by reference.

1.18. "Monthly Maximum Flow" means the total flow of sewage in millions of gallons divided by the total number of days in that

month during which the greatest volume of flow occurs, in any given calendar year, and is expressed in MGD.

1.19. "NPDES Permit" means a National Pollutant Discharge Elimination Permit" granted to the City or to the Participant, as applicable, pursuant to chapter 90.48 RCW and the Federal Water Pollution Control Act, as amended.

1.20. "Other Facilities" means facilities other than the Treatment Plant, the outfall and diffuser, and the Edmonds Way Trunk, which are used by the City and one or more Participants to transmit, measure, and pump sewage.

1.21. "Overhead Costs" means the City's general administrative, supervisory, and other indirect costs related to the operation and maintenance of the Facilities and Other Facilities. Overhead Costs shall be computed by the "step down" method. Overhead costs are described in Exhibit B, attached hereto and by reference incorporated herein.

1.22. "Oversight Committee" means the committee of that name established in Section 8 of this Agreement.

1.23. "Parties" means the City and the Participants.

1.24. "Participant's Jurisdiction" means the service area within which the Participant is responsible for providing wastewater

collection services, depicted on Exhibit F, attached hereto and by this reference incorporated herein.

1.25. "Project" means the Improvements and activities needed to implement it.

1.26. "Project Cost" means (1) the cost of preparing the planning studies and engineering plans and specifications for the Improvements; (2) the amounts paid to contractors for work performed under contracts for construction, installation and inspection of the Improvements; (3) the recorded pay and expenses of employees of the City directly related to the design, construction, installation and inspection of the Improvements, but not including any general City overhead; (4) the cost of materials, equipment and supplies directly related to the Improvements; (5) the cost of acquiring and condemning land, easements and rights-of-way for or related to the Improvements; (6) the cost of legal, engineering and other professional services related to the financing, planning, acquisition, construction, installation and inspection of the Improvements and to the resolving of any disputes or lawsuits related thereto, provided, however, that these costs are attributed to the project as a whole and not to the City's separate share; (7) the cost of obtaining necessary permits and franchises' (8) the cost of any reasonable expenses incurred by the City to mitigate the impact of the Facilities at the Dayton Street site upon the immediately surrounding neighborhood, including but not limited to expenses for landscaping, buffering, limited concealment of secondary clarifiers and street interfaces; (9) the cost of vacant land

purchased by the City in 1984 for expansion of the secondary treatment plant -- a sum of $137,462.06; and (10) other costs reasonably related to the planning, design, project administration, construction management, and general project management for the Improvements.

1.27. "Single Family Residence" means one structure, all connected and under the same roof, located on a lot or tract of real property having a separate and individual property description, with no other structure used for human occupancy located on that tract or lot, and which structure is used as a single family dwelling.

Section 2. Management of the Project. The City shall, to the best of its ability, administer the planning, design, acquisition, construction and construction management of the Improvements and pay for the Project Cost thereof in accordance with the terms of this Agreement. The City shall use its best efforts to obtain permits and approvals necessary for construction, installation and inspection of the Improvements, and to secure grants from available sources.

Section 3. Financing of the Project.

3. 1. Cost of the Project. The approximate Project Cost is estimated to be $39,500,000 . The exact cost of the Project will be determined by the City, acting reasonably, after construction, installation and acceptance of the Improvements. Should all bids or the contract price plus the total amount of all change orders exceed the estimated Project Cost, a bid award or any change order causing the

estimated Project Cost to be exceeded shall be voted on by the Council of the City only after meaningful consultation with the legislative authority of each Participant, at a joint meeting to be called by the City.

The City has entered into a Design Grant Agreement with the State for a maximum of $1.5 million. The City also expects to receive a grant and/or loan from either the State or the Federal Government in an amount equal to approximately 50% of eligible costs as defined by the respective programs. The City shall use its best efforts to obtain these grants. Interest earnings the City is permitted to retain on grant and loan proceeds shall be applied to the Project Cost and shall be treated as grant proceeds for the purpose of this Agreement.

3. 2. Allocation of Project Cost and Plant Capacity.

Part of the Project Cost may be financed from grants and/or loans. The remaining Project Cost shall be paid for by the City and the Participants in the proportionate shares of their respective Allocated Capacities of Domestic Sewage as follows:

Party	Allocated Capacity Of Domestic Sewage (AADF)	Project Cost Contribution %
Edmonds*	4.609 MGD	50.787%
Mountlake Terrace	2.103 MGD	23.174%
Olympic View Water District	1.502 MGD	16.551%
Ronald Sewer District	0.861 MGD	9.488%

TOTAL:	9.075	100.000%

* Edmonds share includes separately contracted capacity for approximately 70 connections in the Town of Woodway, and separately contracted capacity for approximately 200 connections for Lynnwood.

3. 3. Grant Funding. The total amount of grant and/or loan proceeds, including any earned interest, available for the Project, whether received in a lump sum or in installments over a period of time, or through a reduced interest rate loan program, shall be applied toward the reduction of the total Project Cost to be allocated among the Participants as described above.

3. 4. Payment of the Participant's Share of Project Costs. Commencing November 2, 1987, each Participant shall pay to the City its proportionate share of previous eligible Project Costs paid by the City. Subsequently, the City shall submit to each Participant monthly invoices for eligible Project Cost and each Participant shall make every effort to make expeditious payment on the next available disbursement cycle. Documentation provided by the City in support of the preliminary Project Cost amounts shall be similar to documentation required for grant reimbursement. In the event that a Participant's payment is received more than 45 days after receipt of City's bill, the City shall be entitled to a late payment surcharge equal to the interest which the payment would have earned for the period in excess

of 45 days, based on an interest rate typically used for municipal investing purposes.

The Participant shall have the option to pay the balance of its share of the Project Costs in one lump sum on or before the date of the City's issuance of revenue bonds or notes (whichever occurs first), or in monthly payments during the design, construction and installation of the Improvements pursuant to monthly invoices of the City. The Participant's lump sum payment shall be by check, draft or wire transfer in immediately available funds and shall be placed in an escrow account and withdrawn at such times and in such amounts as are determined by the City to be necessary to meet the obligations of the contract for construction and installation of the Improvements. All interest accumulated in an escrow account established in the City Treasury for each Participant shall be returned to the Participant or at the Participant's direction shall be applied to Participant's share of the Project Cost. If the Project Cost exceeds or is less than the estimate set forth in Section 3.1, the City shall at reasonable times and upon reasonable notice in writing assess or refund to the Participant for its share of that difference, and the Participant shall pay those assessments, if any, subject to the provisions of Section 3.1.

3. 5. Bond Issuance. The City and each Participant each retain its rights to issue bonds and other obligations in accordance with applicable law, but shall not act in such a manner as to impair the rights of the holders or owners of bonds issued by any other Party.

Section 4. Upgrading or Expanding the Facilities. If the City is further required by applicable laws or regulations to upgrade or expand the Facilities to provide a higher level of wastewater treatment or to modify the methods and/or locations of wastewater discharge, each Participant shall, if it desires to continue discharging Domestic Sewage into the Facilities, pay the Participant's proportionate share as set forth above of the cost of constructing such additional improvements and/or adding needed equipment, and acquiring land, whether by purchase or lease. The City may require the Participant to make payments on the same basis as the Project Costs. The City and each Participant shall seek opportunities to minimize or avoid the cost of additional improvments through mutually agreeable modifications in the quantity and quality of Domestic Sewage discharge by the Participant. In lieu of paying for its share of the cost of constructing such additional improvements, any Participant may at its discretion discontinue discharge of Domestic Sewage into the Facilities, and then pay only those charges described in 7.3 of this Agreement.

Section 5. Sewage Treatment.

5. 1. Availability of Capacity. Until approximately April, 1991, when the City is scheduled to complete the Improvements, the City shall receive, transport and treat by means of the existing Facilities the domestic sewage discharged by each Participant up to the limits permitted by EPA and DOE. Upon completion of the Improvements, the City shall receive, transport and treat by means of the Facilities the

Domestic Sewage discharged by the Participant up to the Participant's Allocated Capacity of Domestic Sewage. Unless otherwise provided in this Agreement (and/or in other agreements between Participants), a Participant shall not serve customers in another Participant's service area, subject to applicable laws and regulations. The City will provide this quantity of Allocated Capacity of Domestic Sewage as long as the Participant shall require it, barring events and circumstances which are beyond the City's control. However, this Agreement creates no obligation by the City beyond the term of this Agreement.

5. 2. Capacity Limit. After construction of the Improvements, no Party may discharge into the Facilities any Domestic Sewage in amounts greater than its Allocated Capacity of Domestic Sewage, and the City may refuse to accept and treat any amounts in excess of any Party's Allocated Capacity of Domestic Sewage. If the City determines that the amount of the Party's Domestic Sewage is in excess of the Party's Allocated Capacity of Domestic Sewage, the Party shall pay, in addition to its ordinary charges described in Section 7.1, any extraordinary costs incurred by the City to treat the excess Domestic Sewage, as well as costs related to capital costs to treat and transport the excess capacity. Capital costs for treating sewage flows beyond the Capacity Limit or the Allocated Capacity of Domestic Sewage without prior arrangements such as described below, shall be charged according to the methodologies described in Section 5.4 on Transfers of Capacity, and shall be credited to each Party based on its Allocated Capacity of Domestic Sewage. The City shall account to any Party for its extraordinary costs. Any extraordinary costs collected by the City

from the Party shall be credited to the total Operation and Maintenance cost prior to apportionment of M & O costs to the other Parties that are within their respective Allocated Capacities of Domestic Sewage. The City's acceptance of excess amounts on any occasion or occasions shall not bind the City to accept excess Domestic Sewage amounts on any other occasion. When the AADF of the Party reaches 85 percent of the Party's Allocated Capacity of Domestic Sewage, the Party shall commence planning for treatment of its domestic sewage beyond its Allocated Capacity of Domestic Sewage.

5. 3. Notification of Nearing Capacity Limit When any Participant's flow reaches 85 percent of its Capacity Limit, the City shall notify it in writing. The Participant shall commence the preparation of plans to use its remaining Allocated Capacity and to provide for additional capacity beyond the Capacity Limit. The Participant shall be responsible for providing the City with information on proposed development which would increase its flows.

5. 4. Transfer of Capacity. If a Party desires to discharge greater amounts of Domestic Sewage into the Facilities than are allocated as set forth herein, it may request to purchase that additional capacity from any other Party with purchased capacity in the Facilities. If a Party determines that its Allocated Capacity of Domestic Sewage is excessive it may offer to sell such excess capacity to any other Participant. For the purposes of this Section 5 only, the Town of Woodway shall be considered a Party and shall be given the

opportunity to purchase capacity in the future. It is fully recognized by the City and the Participants that no Party is obligated in any way to transfer capacity -- temporary or permanent -- to any other Party. The willingness of any Party to enter into a transfer arrangement and the terms of such arrangement shall not be subject to review by the Oversight Committee or to arbitration.

The City shall be notified of all pending and final transfers of capacity and of all terms of such transfers in writing, and shall make this information available to all Participants.

5.4.1. Cost of Capacity Transfer. The cost of transferring such capacity shall be determined by the Future Value method which is based on the principle that the capacity purchaser should reimburse the capacity seller for all previous payments which the seller has made for the transferred capacity, and for the compounded costs of such payments as defined by an interest rate which the City or the Participant could have expected to receive by investing these payments. The interest rate shall be set by the capacity seller and shall be consistent with generally accepted public accounting principles. Exhibit E, attached and incorporated herein by reference, describes the methodology that would be used to derive the capacity transfer price at any future year.

5.4.2. Alternative Costs of Capacity Transfer. Any two Participants, or any Participant and the City, may agree to different terms than those described above and in the methodology in Exhibit E.

5.4.3. Sharing in Capacity Transfers. In the event that any two participants have agreed to a transfer of capacity on either cost basis above, the other Participants shall be given the opportunity to participate in the transfer if they agree to the transfer costs, and if sufficient capacity is available.

5.4.4. Temporary Capacity Transfers. Temporary capacity transfers will be permitted, for a period not exceeding five years, from any Party having excess capacity to any Party needing capacity on the basis of any terms negotiated between those Parties. The Participants agreeing to a temporary capacity transfer shall notify the City of the terms of their arrangement, which shall include a plan for ending the temporary transfer by demonstrating how permanent provisions are to be made. In no event may the the total Allocated Capacity of Domestic Sewage of the Parties after the transfer exceed the Allocated Capacity of Domestic Sewage of the Parties before the transfer.

5. 5. Treatment of Domestic Sewage Only. No Party shall discharge into the Facilities any wastewater other than Domestic Sewage. The City is obligated to treat only Domestic Sewage and may reject all other forms of wastewater. The City may refuse to transport and treat Domestic Sewage from those portions of any Participant's sewage collection system which do not conform to DOE and/or EPA standards for Domestic Sewage.

5. 6. Sewage Quality. While there has historically been, and continues to be, a presumption that each Participant's and the City's sewage flows are predominantly domestic residential flows with reasonable, and approximately equivalent, levels of Biological Oxygen Demand (BOD) and Suspended Solids (SS) levels, the Participants and the City shall be willing to address any changes in such presumptions. The Participants and the City shall cooperate to develop, as needed, ordinances and programs to mitigate BOD and SS levels which are higher than acceptable norms, as determined by either regulatory requirements or by generally accepted environmental practices. The costs of such programs, if and when undertaken, shall be directly applied to Parties responsible for the discharge of nonconforming wastewater and, unlike general Maintenance and Operation costs, shall not be based on overall sewage flow levels of the City and the Participant.

5. 7. Pre-Treatment Ordinances. If and when required to do so by EPA or DOE, or other applicable regulations and agreements, all the Parties shall adopt a Pre-Treatment Ordinance (or Resolution as may be appropriate) meeting all Federal and/or State requirements. The City shall be responsible for the administration and operation of a pre-treatment program, if and when mandated. Administration and operation shall include, but not be limited to, developing procedures, forms, and instructions; categorizing dischargers; records keeping; compliance tracking; establishment of annual limits; sampling, testing, and monitoring; preparation of control documents; and preparation of permits. Each Participant shall be responsible within its jurisdiction

for identification of dischargers, issuance of control documents, issuance of permits, and enforcement of compliance, and collection of any special fees, penalties, or other associated extraordinary charges. All City costs shall be included in the direct costs of Operation and Maintenance of the treatment plant. All the costs relating to the responsibilities of each Participant shall be absorbed by the Participant.

Section 6. Operation, Treatment and Quality of the Facilities and the Participant's Internal System.

6. 1. Operation and Maintenance of the Facilities. The City shall own and shall be responsible for the operation and maintenance of the Facilities, both before and after construction of the Improvements, subject to the terms of this Agreement. The Facilities shall be operated and maintained in accordance with high engineering standards, and the standards established by the EPA, the DOE, the Washington State Department of Social and Health Services and other federal, state and local agencies. The quantity of Domestic Sewage discharged by a Participant into the Facilities shall be metered at the Influent Point, with the exception of co-mingled flows which will be accounted for by other generally accepted methods using either Equivalent Customer Units, directly measured water flows for winter months, or other methods approved by the Oversight Committee. The meter that measures the Participant's discharge of Domestic Sewage into the Facilities shall be calibrated by the City at least once each

calendar year with the presence of any Participant that so desires, and may be inspected by either Party at the expense of such party at any time upon reasonable notice to the other. The City will continue to monitor other relevant variables such as water consumption by each Participant, rainfall, and other suitable variables, which will be used to provide redundancy for failed meters and an alternative method to check the validity and accuracy of the meter readings. The City and the Participants shall commission a separate engineering study to evaluate metering devices and practices so as to be able to install and properly operate the most suitable measurement and recording devices for the City's and the Participants' needs.

6. 2. Reporting Requirements. Each Participant shall provide the City with monthly reports of the number of sewer connections. The City shall monthly read, record and report the amount of measured Domestic Sewage, measured in MGD, discharged into the Facilities, accounted for by Participant. If a Participant is notified that it has reached 85 percent of its Capacity Limit, the Participant shall at least once every calendar quarter thereafter advise the City in writing of any governmental or private actions that will affect the volume and quality of the Participant's Domestic Sewage flow, including but not limited to the issuance of building permits, sewer permits, water permits and plat approvals, the adoption of land use and zoning ordinances or amendments thereto, and the execution of developer extension contracts.

The City shall periodically inspect its Facilities and the Participant shall periodically inspect its Internal System to ensure adherence to applicable standards and to minimize infiltration, exfiltration and deposits of rock or other debris. During construction of the Improvements and thereafter, the City and any Participant at any reasonable time may inspect the Internal System and the Facilities.

6. 3. The Participants' Internal System. Each Participant shall operate and maintain its Internal System at its sole expense, including all of its facilities as required to maintain the volume and quality of Domestic Sewage within the limits set forth in this Agreement. Each Participant shall observe the highest practicable standards and practices in the construction, operation, and maintenance of its Internal System with particular attention to the following: (a) minimizing entry into the sewerage system of groundwater and/or surface water (I/I - infiltration and inflow); maintaining a favorable character and quality of Domestic Sewage in accordance with the standards set forth in Section 5.6, (b) eliminating septicity and objectionable odors, entry of petroleum wastes or other chemicals and/or wastes detrimental to sewer lines, pumping stations, the Facilities, and the waters of Puget Sound; and (c) maintaining an efficient and economical utility operation, while achieving optimum pollution and environmental control. Each Participant shall prevent, except for unusual circumstances to be reviewed and recommended by the Oversight Committee, the connection of any storm or drainage facilities to its Internal System.

The City shall give written notice to the Participant of any condition within the Participant's Internal System that violates this Agreement or applicable laws, regulations or permits. If the Participant does not correct such condition within a reasonable time after the City gives written notice thereof, the Participant shall pay to the City any reasonable and necessary costs and expenses incurred by the City in connection with such condition. If the Participant discharges into the Facilities any solids, liquids, gases, toxic substances or other substances which the City reasonably believes is causing or will cause damage to the Facilities, or is creating a public nuisance or a hazard to life or property, the Participant shall either discontinue the discharge of such substances or pay for the costs of modifying the Facilities so that they are capable of satisfactorily handling such substances. Because substandard conditions of Domestic Sewage may cause serious damage to the Facilities, the Participant shall comply with any City order regarding the composition of Domestic Sewage, and after compliance may thereafter cause to be arbitrated the reasonableness of that order in accordance with Section 10.

The Parties shall cooperate with each other to determine the source of possible violations of applicable law, regulations and permits (including applicable NPDES Permits). In the event the City is fined or otherwise penalized by local, State, or Federal agencies for failure to operate or maintain the Facilities in accordance with the requirements of the agencies, and it is demonstrated to the satisfaction of the City that such failure is due in whole or in part to the Participant's discharge of Domestic Sewage in violation of this Agreement, then the Participant shall pay its allocable share (as

determined by the parties or by an arbitrator in accordance with Section 10) of the costs of such fines or penalties, including its share of the associated administrative, legal and engineering costs incurred by the City in connection with the fines or penalties.

6. 4. Ballinger Lift Station and Related Facilities. The City, at its convenience, but no later than one year after completion of the Treatment Plant Project, shall assume ownership and operational responsibility for the Ballinger Lift Station and related meters and sewer mains from the City of Mountlake Terrace. If found necessary on the basis of the City's evaluation and at the City's discretion, these facilities shall then be upgraded to conform with City standards and needs, with capital cost participation by Mountlake Terrace and Ronald Sewer District based on capacity and with each of those Participants paying its share of the capital costs at the time of construction. Operation and Maintenance costs will be allocated to each Participant annually on the basis of AADF.

The City shall have the option of transferring the responsibility for the flows currently transported through the Ballinger Lift Station to the Municipality of Metropolitan Seattle ("Metro") in the event that a sewage exchange for Metro Richmond Beach flows is implemented. In the event of such a flow transfer, and the construction of various facilities needed to implement the Metro transfer, the City, Mountlake Terrace, and Ronald Sewer District would retain the responsibility of all capital and Maintenance and Operation Costs, including possible demolition of the existing lift station, on

the basis of proportionate share of annual flow through the Metro transfer facilities. Under the Metro option the City would still retain the responsibilities related to the transport and treatment of the domestic sewage that currently flows through the Ballinger Lift Station, including, but not limited to, planning, preliminary and final engineering, metering, recording, accounting and reporting. The assumption by the City of the Ballinger Lift Station -- either through the City's ownership and operation, or through transfer to Metro -- shall include a provision for honoring the existing agreement between Mountlake Terrace and Lynnwood for emergency overflow to the west trunk sewer with payment to the City via Mountlake Terrace by method that will protect the parties' purchased capacity at the Facilities. Also as part of this section, Mountlake Terrace shall have the right to close out its existing remaining debt service obligation to the City for existing facilities, because this remaining obligation is relatively small and has a very brief remaining period.

The Parties to this Section 6.4 shall cooperate to the extent necessary to facilitate the sewage transfer between the City and Metro, recognizing that the construction of these facilities may include some temporary flow diversions, construction impacts, and other impacts which may not totally be anticipated at this time. It is recognized that the costs of the Ballinger Lift Station and the related facilities for implementing a Metro transfer are only participated in by the City, Mountlake Terrace, and Ronald Sewer District.

6. 5. Joint Use of Collection Systems Owned by One Party. It is recognized by the Parties that at present certain Parties discharge sewage into a collection and transmission system which is part of the Internal System of another Party. Furthermore, in the future one Party may wish to use parts of the Internal System of another Party as a practical means of transporting sewage. The joint use areas are shown on the Service Area maps in Exhibit F.

The joint usage of such facilities shall be agreed to by both the discharging Party and the Party that owns these facilities. The discharging Party's volume of flow shall not be counted in the calculation of the facility owner's volume of Allocated Capacity of Domestic Sewage.

6. 6. Charges and Procedures Related to Joint Sewerage Areas of Olympic View Water and Sewer District and the City of Edmonds. The joint areas of these two Participants are shown in Exhibit F. The discharging Participant shall be responsible for all charges collected by the City for the transmission and treatment of the Domestic Sewage discharged into the joint facility, including all the costs contained in this Agreement , if applicable. The Participant owning the facility shall be reimbursed by the discharging Participant at the owning Participant's current rates for all costs related to the jointly used collection facility including Maintenance and Operation costs and General Facility Fees (also known as connection charges) related to this facility only. The discharging Participant shall be responsible for the billing of the discharging customer and for reimbursing the facility owner for its costs relating to the shared

facility. Sewer permits and inspections shall be provided by the discharger's Participant and such Participant shall provide the facility owner with a copy of the side sewer card and inspection report within 30 days after the final inspection. Should a jointly used Internal System require either capacity expansion or other capital improvements, the terms of funding such improvements shall be negotiated between the facility owner and the discharger's Participant.

Section 7. Payment for Maintenance, Operation, and Overhead Costs for the Treatment of Domestic Sewage.

7. 1. Monthly Payments. Commencing as soon as practicably possible after the execution of this Agreement, the Participant shall make monthly payments to the City for the transportation and treatment of each Participant's Domestic Sewage. The monthly payments shall consist of one twelfth of the Participant's proportionate share of the Maintenance and Operation Costs and Overhead Costs adopted in the annual budget of the City for the Facilities. Each Participant's percentage share of the total annual Maintenance and Operation Costs and Overhead Costs shall be determined by dividing the AADF of the Participant for the calendar year preceding the budget year by the sum of the AADF of the Participants and the City for the calendar year preceding the budget year. If the total amount paid by the Participant during any calendar year is different from the amount due and owing for the calendar year based on actual AADF and Maintenance and Operation Costs and Overhead Costs, a final adjusting bill or payment shall be made by the City by April 1 of the subsequent year with the adjustment

being paid or credited in 6 equal monthly installments. The estimated current monthly payments shall be computed on the basis of the following formula:

Allocation = (Most recent July-July flow %) X (Adopted O&M Budget)/12

Note: for the purposes of this Agreement the O & M Budget shall include the Overhead costs as well as direct costs.

The City shall provide the Participants with a full accounting of all flows for each calendar year as well as a separate summary of the actual Maintenance and Operation Costs incurred during the previous calendar year. The flows and costs will include both the Facilities and the Other Facilities, and shall be provided at the earliest time possible during the calendar year, and no later than March 1, barring unforeseen circumstances.

Each Participant's monthly payments shall be due at the earliest date depending on the Participant's accounts payable cycle. In the event that the Participant's payment is received more than 45 days after receipt of City's bill, the City shall be entitled to a late payment surcharge equal to the interest which the payment would have earned for the period in excess of 45 days, based on an interest rate typically used for municipal investing purposes.

7. 2. Overhead Costs. In addition to the direct Maintenance and Operation costs described in Appendix B, each Participant will pay an Overhead Cost equal to 10 percent of the direct Maintenance and Operation Costs allocable to that Participant. The

percentage was computed by the "step-down" allocation method as applied to the City's general administrative, supervisory, and other indirect costs related to the operation and maintenance of the Facilities. The Overhead Cost percentage may be reviewed by the Oversight Committee at the request of any of the Participants within 3 years of the new plant start-up, estimated to be April of 1991. Any future review and change in the percentage shall utilize the "step down" method.

7. 3. Standby Maintenance Charge. Whenever a Participant discontinues the discharge of Domestic Sewage into the Facilities, or discharges less than 0.3 MGD of Domestic Sewage into the Facilities for a period of 30 days or more, the Participant shall pay to the City in lieu of the monthly charge described above (Section 7.1) until it regularly discharges more than 0.4 MGD, a standby maintenance charge, which shall be a monthly fee calculated by the City to provide for the Participant's proportionate share (as defined in Section 3.2) of the City's fixed (not related to amount of sewage) costs of operating and maintaining the Facilities in a condition of readiness to accept and treat Domestic Sewage at the full capacity of the Facilities. The Participant shall give the City written notice of its intention to discontinue the discharge of Domestic Sewage (or to reduce its regular discharge to less than 0.3 MGD) at least 2 months prior to such discontinuance, and shall give the City 2 months notice of its intention to commence discharging Domestic Sewage over 0.4 MGD into the Facilities. Overhead Costs shall be added to this charge.

7. 4. Facilities Capital Improvements Fund. The City shall establish a capital improvements fund to handle future capital improvements, major replacements, or major repairs not included within the regular Maintenance and Operation Costs. The amount of the capital improvements fund shall be initially set at $100,000. Each Participant shall contribute to the fund in the same ratio as its original allocated capacity percentage as shown in Exhibit A. Disbursements from the fund shall be treated as having been made on a pro rata basis according to the same allocation as contributions to the fund. Initial assessments to the fund shall be made in equal annual installments over a period of five years. Subsequent assessments shall be structured so as to maintain as nearly as possible a $100,000 balance, and shall be phased on the same basis as the original assessments to the fund. Every five years the nominal amount of the fund (originally $100,000) shall be increased to reflect inflationary cost increases, using such commonly accepted indices as the Engineering News Record (ENR) Construction Index.

The City shall maintain a separate accounting of the fund with any interest earning accruing and remaining in the fund.

Disbursements from the fund in excess of $30,000 (as adjustable for inflationary cost increases as described above) shall be approved by the City Council, only after review and comment by the Oversight Committee.

The existence of the Capital Improvements Fund and the fact that expenditures are made therefrom shall not be construed as limiting the ability of the City to make and allocate to the Participants needed expenditures on an emergency basis and under the terms of this

Agreement when the public safety, health and general welfare, legal and regulatory requirements or unforseen circumstances require expeditious action.

Money in the Capital Improvements Fund shall be used only for future capital improvements, major repairs and major replacements to the Facilities, and shall not be pledged to or used for payment of any bonds, notes or obligations of the City or any of the other Participants. Expenditures from the Fund shall be considered a Maintenance and Operation Cost as defined in this Agreement and those expenditures shall be made as directed by the City. For purposes of cost allocation to Participants, however, these expenditures in the Maintenance and Operation Costs category will be allocated on the basis of Allocated Capacity of Domestic Sewage and not on the basis of annual flow.

7. 5. Participant's Rates and Sources of Payment. The Participant shall pay the charges described in Sections 7.1 through 7.3 out of the revenues of the Participant's Internal System. The Participant's payments to the City shall be part of the expenses of maintenance and operation of the Participant's Internal System, prior and superior to any charge or lien of any revenue bonds issued by the Participant that are payable from the revenues of its Internal System. The Participant shall establish rates and collect fees and charges for sewer service in amounts at least sufficient to pay for (a) the maintenance and operaton of the Participant's Internal System, including the Participant's payments to the City, and (b) the principal

of and interest on any and all Participant revenue obligations that constitute a charge on the revenue of the Participant's Internal System.

7. 6. City Rates. The City shall establish rates and collect fees for sewer service in amounts at least sufficient to pay for (a) the maintenance and operation of the City's sewer system, including its share of the Facilities, and (b) the principal of and interest on any and all City revenue obligations that constitute a charge upon the revenues of the City's sewer system.

7. 7. Books and Accounts. The City shall keep full and complete books of accounts showing the Maintenance and Operation Costs incurred in connection with the Facilities and the Other Facilities, and the portion thereof applicable to each of the Participants. The costs of keeping those books shall be considered to be a Maintenance and Operation Cost to the City. Audits of the books shall be performed every three years unless waived by the Oversight Committee, and the cost shall be considered a direct cost of the Treatment Plant. More frequent audits, if requested by any Participant, shall be charged to the Participant(s) making the request.

Section 8. Oversight Committee.

8.1. Establishment of Oversight Committee. There is hereby established an Oversight Committee for the purpose of (a) advising the City concerning construction, operation, maintenance and expansion of the Facilities, (b) giving the Participants the opportunity to resolve any disagreements that may arise between or

among them with respect to the construction, operation, maintenance and expansion of the Facilities, (c) providing a mechanism for reviewing construction cost which raise the total Project Cost above $39.5 million, and (d) for the additional purposes described in this Agreement. The Oversight Committee shall consist of a designated representative (or designated alternate representative) of each Participant. Each Participant shall have one vote.

8.2. Oversight of Construction. Prior to and during construction of the Improvements, the City shall report to the Oversight Committee at least once each month concerning progress of the Project. Any increase in the Construction Cost above $39.5 million at the time of the awarding of the contract for construction of the Improvements, or at the time construction contract amendments are requested, shall be reviewed by the Participants in accordance with Section 3.

8.3. Oversight of Operations and Maintenance. After acceptance of the Improvements, the Oversight Committee shall meet at least quarterly, unless, by a vote of at least a majority of the votes held by the Participants, the Oversight Committee decides to meet less frequently. At each quarterly meeting of the Oversight Committee, the City shall report to the other Participants concerning the operation and maintenance of the Facilities as more particularly described in Exhibit B.

On or before July 1 of each year, the City shall provide to the other participants a preliminary proposed budget for operation and

maintenance of the Facilities during the following year. The City shall review and consider any reports and recommendations made by the Oversight Committee on subjects and matters described in Exhibit B.

Section 9. Replacement Standards; Insurance.

9. 1. Replacement and Rehabilitation Standards. Replacement, reconstruction, rehabilitation, expansion or upgrading of the Facilities shall be in accordance with applicable federal, state and local laws and regulations. Additions, betterments and improvements to the Facilities of the City shall be installed and constructed in accordance with generally recognized engineering standards at least equal to the standards of the City and in accordance with all applicable federal, state and local laws and regulations.

9. 2. Insurance. The City shall purchase on behalf of all the Participants and maintain, through either companies or insurance pools, insurance sufficient to pay for all loss or damage to the Facilities resulting from their operation in a normal and prudent manner, including loss or damage caused by the operation of joint sewerage facilities which are not a direct part of the Treatment Plant. The Participant shall purchase and maintain, through either companies or insurance pools, insurance sufficient to pay for all loss or damage to the Facilities caused by the operation of its Internal System. In the alternative, the City or a Participant may set aside cash in a reserve fund in an amount sufficient to pay for such loss or damage, subject to review and recommendation by the Oversight Committee.

Section 10. Arbitration. In the event of a dispute between the City and a Participant concerning any matters arising under the terms and conditions of this Agreement, unless specifically excluded from arbitration, the dispute shall first be considered by the Oversight Committee in a non-binding manner. If the dispute is not settled in the Oversight Committee, it shall be placed before an arbitrator approved by the disputing parties, and the decision of that arbitrator shall be final and binding on both parties. However, the parties by agreement may waive arbitration. The venue of the arbitration shall be the Seattle vicinity, unless the disputing parties agree otherwise. The arbitrator's fees and costs shall be shared equally by the Parties.

Section 11. Successors and Assigns. This Agreement shall inure to the benefit of and be binding upon successors in interest and assigns of the Parties, and is not intended to confer rights or benefits upon any third party except as expressly stated herein. Performance of the obligations undertaken by either party may not be assigned without the prior written consent of the other, which consent shall not be unreasonably withheld.

Section 12. Amendment or Modification. No amendment or modification of this Agreement, including any addition or deletion thereto, shall be effective unless approved and executed by the Parties in the same form and manner as, and subject to the remaining provisions of, this Agreement. In the event the City contracts with any Participant in a manner that modifies the term of this Agreement, the

City and that Participant shall offer the other Participants the opportunity to incorporate the same terms in this Agreement or in additional contracts, assuming the modifications are applicable to the Participants.

Section 13. Governing Laws. This Agreement shall be governed and construed in accordance with the laws of the State of Washington. Venue in connection with any legal proceeding affecting this Agreement shall be in the Superior Court of the State of Washington for Snohomish County.

Section 14. Number and gender. Whenever applicable the use of the singular number shall include the plural, the use of the plural number shall include the singular and the use of any gender shall be applicable to all genders.

Section 15. Notice. All notices and payments relating to this Agreement shall be made at the following addresses, unless the other party is otherwise previously notified in writing:

To the City:

City of Edmonds
505 Bell Street
Edmonds, Washington 98020

To the Participant:

City of Mountlake Terrace
23200 58th Ave. West
Mountlake Terrace, WA 98043-4697

Olympic View Water and Sewer District
23725 Edmonds Way
Edmonds, WA 98020-6097

Ronald Sewer District
17505 Linden Ave. N.
P.O. Box 33490
Seattle, WA 98133

Section 16. Term. The term of this agreement shall be for 30 years from its effective date. At the end of this period the parties will negotiate in good faith towards the continuance of this Agreement with the understanding that the economic terms of continued participation will reflect the investment of the Participants in the Facilities and the remaining useful life and remaining capacity of the Facilities at that time.

Section 17. Memorandum of Understanding. This Agreement shall be construed and applied consistent with the Memorandum of Understanding, attached as Exhibit C, but in the event of conflict, this Agreement shall govern. This Agreement supersedes and replaces sewage service agreements between the City and Olympic View Water and Sewer District (dated October 9, 1967), and between the City and the City of Mountlake Terrace (dated October 5, 1971), and those agreements shall be of no further force and effect.

EXECUTED IN DUPLICATE to be effective as of the date set forth above, or such later effective date as may be required under Chapter 39.34 RCW, if applicable.

CITY OF MOUNTLAKE TERRACE

By Pete W Straight
Mayor

CITY OF EDMONDS

By G S Mugglton
Mayor

VOL. 2146 PAGE 0040

Attest: _____

Approved as to Form:

_____

OLYMPIC VIEW WATER AND SEWER DISTRICT

By _____
President, Board of Commissioners

Attest: _____

Approved as to Form:

_____

Attest: _____

Approved as to Form:

_____

RONALD SEWER DISTRICT

By _____
President, Board of Commissioners

Attest: _____

Approved as to Form:

_____

Exhibit A

Allocated Capacity and Proportionate Share

	Allocated Capacity of Domestic Sewage*	Proportionate Percentage
Edmonds**	4.609 MGD	50.787%
Mountlake Terrace	2.103 MGD	23.174%
Olympic View Water District	1.502 MGD	16.551%
Ronald Sewer District	0.861 MGD	9.488%
TOTAL:	9.075	100.000%

** Edmonds share includes separately contracted capacity for approximately 70 connections in the Town of Woodway, and separately contracted capacity for approximately 200 connections for Lynnwood.

* Expressed in MGD's of AADF

Exhibit B

MAINTENANCE AND OPERATION COSTS -DIRECT

Direct costs include, but are not limited to: Labor, power, light, water, heat, phones, chemicals, equipment, tools, materials, supplies, insurance premiums, engineering services, attorney services, other contract services, rent, inspection, and taxes;

The cost of rehabilitating, reconstructing or replacing equipment and portions of the Facilities as needed to continue substantially the same capacity and quality of service (Facilities Reserve and Replacement Fund., Section 7.4) or the debt service costs for obligations incurred for such replacement, rehabilitation or reconstruction (provided, that where the Participant provides a cash contribution for such replacement, rehabilitation or reconstruction, the City's debt service costs relating to the same replacement, rehabilitation or reconstruction shall not be included in Maintenance and Operation Costs for purposes of this Agreement); and

Such financing and debt service costs for which the Parties may become jointly liable.

MAINTENANCE AND OPERATION COSTS -- OVERHEAD

These are the costs which are initially set at 10% of the Direct O & M costs. They were computed by the Step Down method, and are intended to recover general governmental costs related to the operation of the wastewater treatment plant and related facilities. These costs include but are not limited to: financial costs including budgeting, accounting, accounts payable; data processing; risk management; personnel administration including hiring, personnel management; buildings and grounds maintenance performed by the City; custodial work if needed; general legal costs; security; equipment rental (unless directly charged).

Exhibit C

Memorandum of Understanding

June 30, 1987
Rev. 7/15/87
Rev. 9/9/87
Rev. 9/22/87 flows only

MEMORANDUM OF UNDERSTANDING

Background

The representatives of the jurisdictions named below and referred to as the Participants, have been meeting regularly since March, 1987, to draft the elements of an Agreement for the provision of Secondary Sewerage Treatment Facilities (the Project) by the City of Edmonds for the Participants. This Memorandum incorporates most of the principles and concepts which the Legislative bodies have set in position papers exchanged earlier this year.

Immediate execution of this Memorandum will enable all the Participants to commence financial participation in the project, and will be followed by the expedient preparation of a full legal Agreement.

Principles

1. Each Participant is to fund its own share of plant design capacity, which for the purposes of cost allocation is defined as Annual Average Daily Flow (AADF), expressed in units of million gallons per day (MGD).

2. The following ultimate design capacities, expressed in Annual Average Daily Flows, will be made available to each participant:

	Capacity	Percentage
Edmonds	4.498	49.564%
Mountlake Terrace	2.082	22.938%
Olympic View Water District	1.487	16.389%
Ronald Sewer District	0.852	9.383%
Woodway (464 ECU's)	0.107	1.183%
Lynnwood	0.049	0.543%
TOTAL:	9.076	100.000%

Note: It is recognized that these percentages are subject to minor fluctuations for a brief interim period while some Participants are finalizing their precise flow figures.

3. The total project costs shall be allocated among the Participants according to the percentages of capacity as committed under item

#2. Total project cost shall not exceed $45 million without Participant approval.

4. Annual Operations and Maintenance costs, formalized in an annual budget, shall be allocated to the participants on the basis of yearly Annual Average Daily Flow percentages. Payments will be made on a monthly basis

   Allocation = (Last Year Flow %) x (Adopted Budget)/ 12

   Note: An adjustment will be made at year's end to correct for actual expenditures and for actual flows.

5. All participants concur as to the formation of a formal Oversight Committee, advisory to the Edmonds City Council. The role of the Committee, to be provided for in detail in the final Agreement, shall include review and submittal of recommendations on various operational and budgetary matters of a certain level of significance. Examples would include the establishment of a preliminary proposed annual budget by approximately the middle of the year; overhead costs levels; Reserve and Replacement Fund expenditures over $30,000; establishment and review of annual cost audits; long term capital plans; and influent quality standards"

6. An overhead cost equal to 10% of direct costs of O and M shall be charged to all participants. The costs included in the direct and the overhead categories shall be detailed to the greatest extent possible in a technical appendix to the Agreement. The overhead factor can be reviewed by the Oversight Committee at the request of any of the Participants within 3 years of new plant start up. The Step-Down method shall be utilized for the purpose of computing and reviewing the overhead cost allocation.

7. Eligible costs shall include the costs of reasonable mitigation measures at the present Dayton Street site, designed with intent of minimizing and mitigating the impact of the plant on the immediate residential and commercial neighborhood. Costs shall include such elements as landscaping, buffering, limited structural concealment of the secondary clarifiers, a pleasant appearing street interface, and other necessary elements to achieve the objectives of reasonable mitigation. Also included will be the cost of the vacant parcel which was purchased by Edmonds in 1984 for the purposes of expansion to secondary treatment.

8. The final agreement shall contain provisions for the establishment of a reserve and replacement fund, to be shared in the same proportions as the capacity (item #2 above). The amount shall be established by the Oversight Committee, and all expenditures from the fund in excess of $30,000 shall be subject to its review. This will not be construed as limiting the ability of Edmonds to make and allocate to the Participants needed expenditures on an emergency basis when the public safety, health, and general

welfare, regulatory mandates, or other unforeseen circumstances require expeditious action.

9. Any governmental grants to the project, whether made in a lump sum or through extended payments, shall be applied proportionately to the capacity shares paid by the Participants.

10. Upon execution of this Memorandum with the City of Edmonds, each signatory shall commence payment of outstanding and future invoices related to the planning, design, and construction of the project, at the percentage specified under item #2. Remittances are to be made to the City of Edmonds on a monthly basis. Documentation for billing shall be in the same manner as for grant reimbursements.

11. The final agreement shall include a provision for the transfer of capacity among willing Participants in this Memorandum and the subsequent Agreement, and shall include a method of determining appropriate cost of such transferred capacity.

12. Provisions shall be included for monitoring flows and land use permits, and for ensuring that allocated capacities are not exceeded by any participant.

13. The City of Edmonds, no later than January 1, 1992, shall assume ownership and operational responsibilities for the Ballinger Lift Station and related meters and sewer mains from the City of Mountlake Terrace. The facility shall be upgraded to conform with City of Edmonds standards and needs, with cost participation by Mountlake Terrace and Ronald Sewer District based on flows. Operations and Maintenance costs shall also be allocated on the basis on annual average daily flows. The City of Edmonds shall have the option of transferring operation of this lift station to Seattle Metro in the event that a sewage exchange for Richmond Beach flows is successfully implemented, and that such transfer of responsibilities is advantageous, to the same degree as without a flow exchange to Metro, to all parties.

14. Existing debt service obligations for the present system (an outstanding amount of approximately $25,000) shall be prepaid by the City of Mountlake Terrace at the time when the City of Edmonds assumes ownership and operational responsibility of the Ballinger Pump Station and related facilities. This would void existing capital obligations on the present treatment plant.

15. The City of Edmonds shall have a separate agreement with Ronald Sewer District for both sewage treatment and for the Ballinger lift station operation. The former agreement shall commence with the execution of this Memorandum, and the latter shall be implemented according to #13.

16. Ownership, operation, and maintenance of the treatment plant, and all attendant responsibilities, rest with Edmonds.

17. The term of the agreement shall be for 30 years, with the Participants having a lifetime of plant interest by paying their share.

18. Capacity will be based on flow quantities only and not on sewage quality characteristics such as BOD and/or SS. Provisions will be made for the City of Edmonds to determine the acceptability, terms, and conditions for service to any customer within the service area who is found to have excessive BOD, excessive SS, or any other influent characteristics which may impact plant operations and costs.

19 Provision shall be made for honoring existing agreement between Lynnwood and Mountlake Terrace for emergency overflow to west trunk sewer with payment to Edmonds via Mountlake Terrace by method that will protect the parties' purchased capacity.

20. Special provisions need to be made for cost allocation where the Participants serve customers in other Participant's jurisdictions, and where direct sewage metering is impractical.

21. Edmonds shall be responsible for the maintenance of accounting systems as required my accepted standards.

22. Provision shall be made for arbitration of disputes.

23. The concepts contained in this Memorandum, and in the subsequent full agreement, shall apply in predominantly the same manner to all parties sharing in the capacity of the plant. Some provisions may be necessary to address matters outside the Project of the Plant Operations, and which are of interest to some of the Participants only. Should the Participants not sign this memorandum simultaneously, any "latecomers" shall make payments to the other Participants (either directly or through Edmonds) for expenses already incurred. It is anticipated that Participants will be excluded from capacity participation in the treatment plant, other than as provided in existing contracts, unless the Memorandum is executed by September 20, 1987.

24. Edmonds and Olympic View Water and Sewer District agree to negotiate in good faith any and all operational service and administrative issues which are contained in existing agreements, or issues not contained in any agreements, and fall outside the funding of the Secondary Treatment Project and the operation of the Plant.

25. Section 23 notwithstanding, the City of Edmonds, at its own discretion, may assist the Town of Woodway in financing its share of the Project, on terms which are acceptable to both parties. This is in recognition of the unique obstacles which Woodway faces in financing its share of the project costs. Other Participant may offer the same kind of assistance to Woodway, subject to a review by the City of Edmonds.

26. The execution of the Memorandum does not limit the right of all parties to negotiate the details of incorporating the principles of the Memorandum into the final Agreement.

MEMORANDUM OF UNDERSTANDING

SIGNATURE PAGE

City of Edmonds:

Larry S. Naughten, Mayor

Date: 9-24-87

Attest: Jacqueline G. Larrett, City Clerk
Signature, Title

City of Mountlake Terrace:

~~Lois Anderson, Mayor~~ City Manager (As approved by City Council)

Date: 9/29/87

Attest: Signature, Title City Clerk

Ronald Sewer District:

Phil Montgomery, Board of Commissioner — Irv Potter — James Sinclair

Date: 10-5-87

Attest: Signature, Title Commissioner/Sec.

MEMOUND3/TXTSECON

MEMORANDUM OF UNDERSTANDING

SIGNATURE PAGE

Olympic View Water District:

John M. Fischer Patricia L. Meeker Carolyn E. Nacke
Board of Commissioners

Date: 11-2-87

Attest: Signature, Office Manager
Title

MEMOUND3/TXTSECON

Exhibit D

Equivalent Customer Calculation Parameters

In areas of co-mingled and/or unmetered flows, direct measurement of one Participant's flows through the Internal System of another Participant may not be practical. In such a case the Parties would reach an agreement to determine alternative measures of sewage flows. The following uses shall be considered as having the listed Equivalent Customer Units:

Single Family House -- 1 ECU.

Non-Residential Dischargers (including all residential other than single family houses) -- 1 ECU per 750 cu. ft. per month of water usage.

The 750 cu. ft. per month per ECU equivalence shall be subject to review by the Oversight Committee when requested by any Participant.

It is expected that Parties who use this Exhibit for computation of sewage flows will take into account factors which may cause the literal application of ECU methodology to either overestimate or underestimate the sewage flows. As an example, a school with extensive grounds would have very large seasonal fluctuations as to the actual sewage being discharged into an Internal System of a Participant, as well as in the consumption of water. The typical use of winter water consumption, which excludes lawn watering, would not be an accurate substitute because in the summer the school is vacant. Summer water consumption, however, is an inaccurate substitute as well because in includes irrigation water which is not discharged into sewerage systems. This example illustrates the problem, but in reality no school is in an area of co-mingled flows. In fact, almost all the uses in co-mingled flow areas are residential.

Exhibit E

Methodology for Cost Computation Related to Capacity Transfer

EXHIBIT E

TRANSFER OF CAPACITY COST CALCULATIONS METHODOLOGY

PROJECT COSTS AND FINANCING PARAMETERS

TOTAL COST:	$39,500,000	BOND INTEREST:	8.00%	FUTURE VALUE INTEREST RATE:	8.00%
GRANT:	50.00%	TERM:	20		
CAPACITY (MGD'S)	9.075	YEARLY PAYM'T:	$22,166		
1988 NET COST OF 0.1 MGD (Approx. 430 homes):			$217,631		
FUTURE VALUE OF 0.1 MGD IN YR. 20:			$1,014,368		
Average daily flow from typical home, gal.:			230		

(defined by capacity seller on the basis of a commonly used public finance index for municipal investments. It can be equal to the bonding interest rate.)

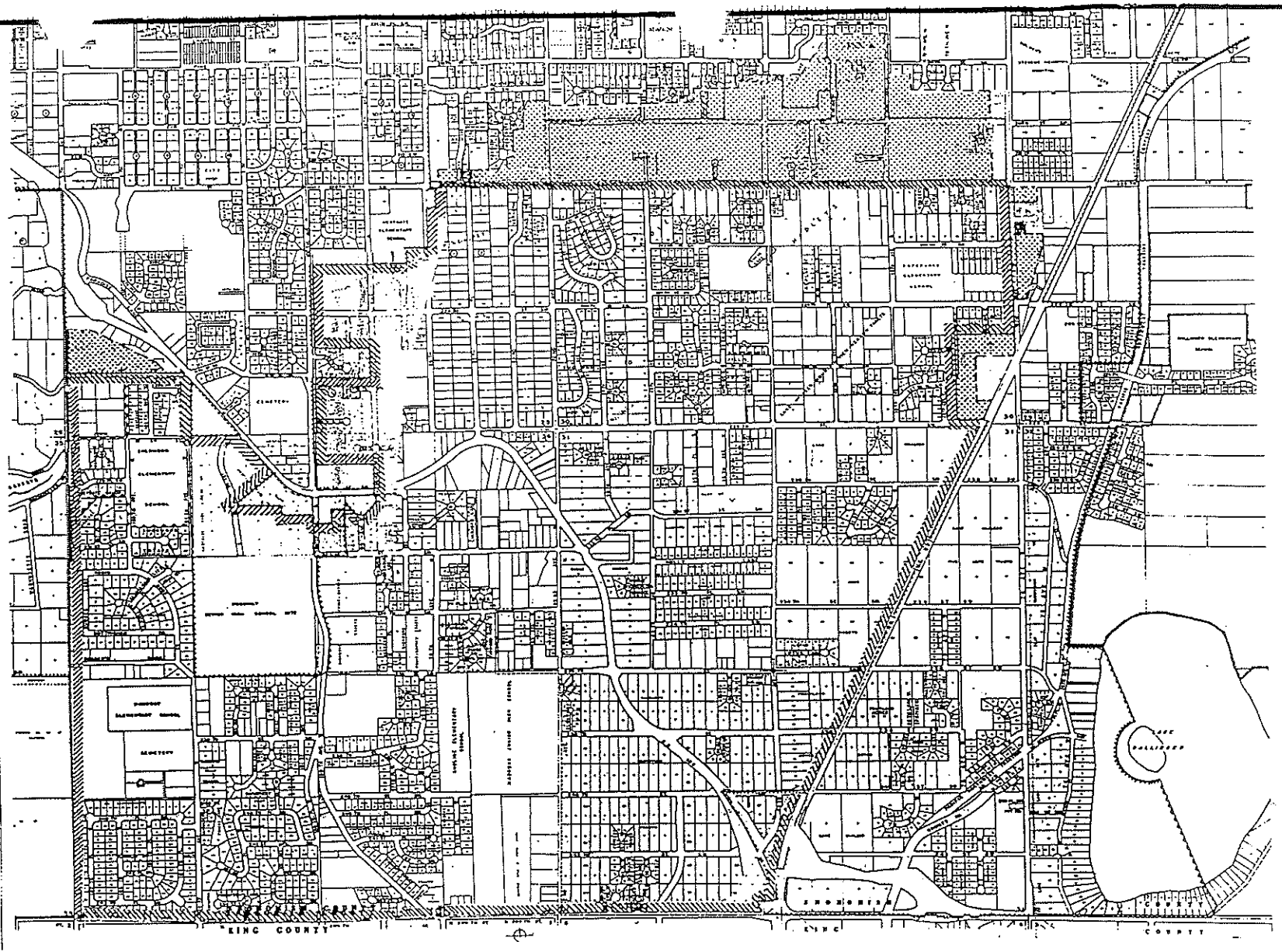
YEAR	ACTUAL DEBT SERVICE	CUMULATIVE VALUE	FUTURE VALUE	YEAR	FUTURE VALUE
1	$22,166	$22,166	$22,166	31	$2,365,140
2	$22,166	$44,332	$46,106	32	$2,554,351
3	$22,166	$66,499	$71,960	33	$2,758,700
4	$22,166	$88,665	$99,883	34	$2,979,395
5	$22,166	$110,831	$130,040	35	$3,217,747
6	$22,166	$132,997	$162,610	36	$3,475,167
7	$22,166	$155,163	$197,784	37	$3,753,180
8	$22,166	$177,329	$235,773	38	$4,053,435
9	$22,166	$199,496	$276,801	39	$4,377,709
10	$22,166	$221,662	$321,112	40	$4,727,926
11	$22,166	$243,828	$368,967	41	$5,106,160
12	$22,166	$265,994	$420,650	42	$5,514,653
13	$22,166	$288,160	$476,469	43	$5,955,825
14	$22,166	$310,327	$536,752	44	$6,432,291
15	$22,166	$332,493	$601,859	45	$6,946,875
16	$22,166	$354,659	$672,174	46	$7,502,625
17	$22,166	$376,825	$748,114	47	$8,102,835
18	$22,166	$398,991	$830,129	48	$8,751,061
19	$22,166	$421,157	$918,705	49	$9,451,146
20	$22,166	$443,324	$1,014,368	50	$10,207,238
21			$1,095,518	51	$11,023,817
22			$1,183,159	52	$11,905,722
23			$1,277,812	53	$12,858,180
24			$1,380,037	54	$13,886,835
25			$1,490,440	55	$14,997,781
26			$1,609,675	56	$16,197,604
27			$1,738,449	57	$17,493,412
28			$1,877,525	58	$18,892,885
29			$2,027,726	59	$20,404,316
30			$2,189,945	60	$22,036,661

NOTE: FUTURE VALUE COLUMN IS THE AMOUNT WHICH A PARTICIPANT WOULD HAVE HAD IF INSTEAD OF BUYING 0.1 MGD, ITS FUNDS HAD BEEN INVESTED AT THE FUTURE VALUE INTEREST RATE. TYPICAL HOME FLOWS ARE FOR EXAMPLE ONLY.

FILE:FUTCOST1 4/8/88

Exhibit F

Description of Service Areas - 1988



LEGEND

JOINT USE SERVICE AREAS (PER SECT. 6.5 OF AGREEMENT)

BOUNDARY OF OLYMPIC VIEW SEWERAGE SERVICE AREA

EDMONDS CITY LIMITS APRIL 26 1988

BOUNDARIES OF OLYMPIC VIEW SEWERAGE SERVICE AREA PER AGREEMENT FOR SANITARY SEWERAGE SERVICE TO BE PROVIDED TO OLYMPIC VIEW BY EDMONDS

EXHIBIT "F"

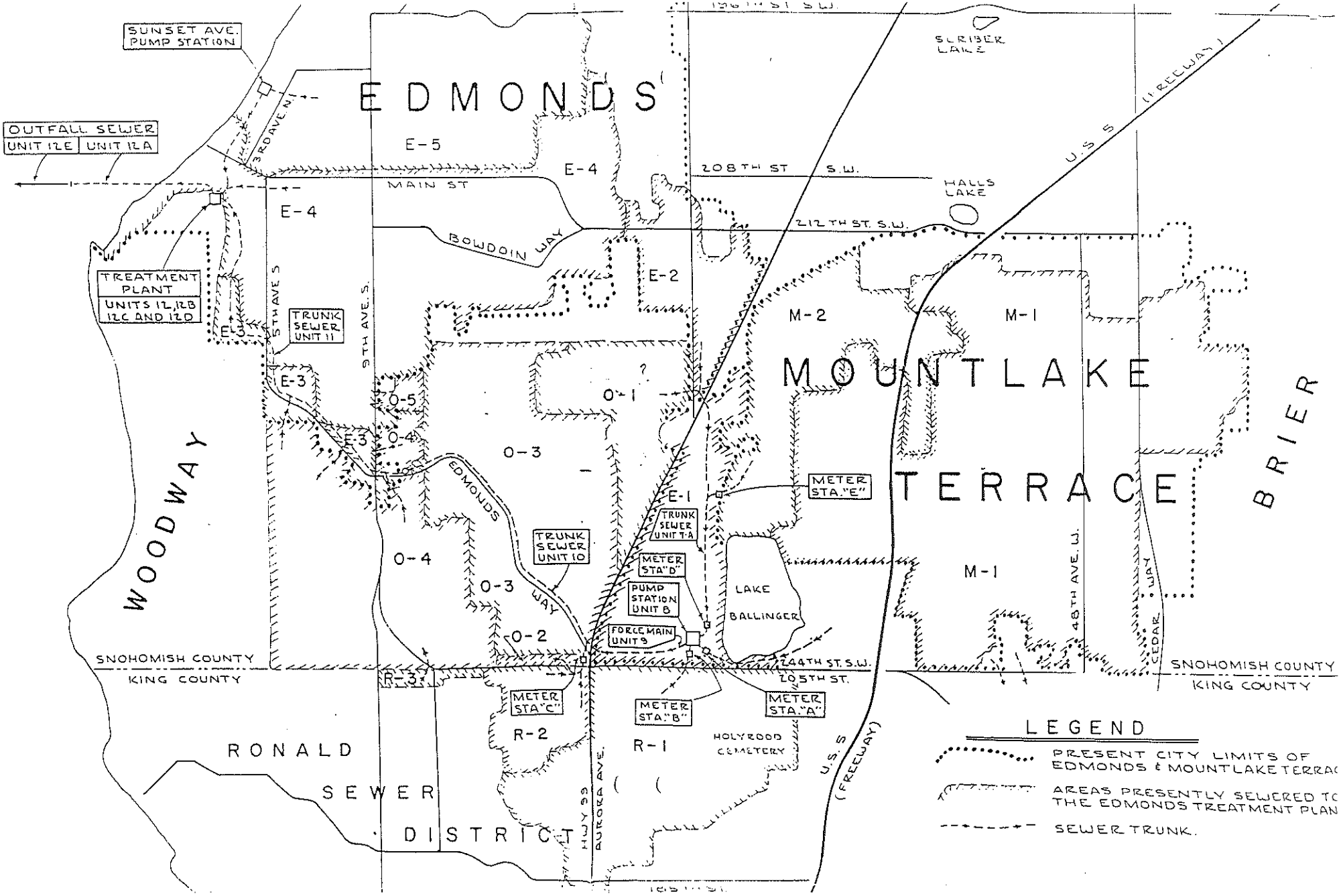

SUNSET AVE. PUMP STATION
OUTFALL SEWER
UNIT 12E
UNIT 12A
TREATMENT PLANT
UNITS 12, 12B 12C AND 12D
TRUNK SEWER UNIT 11
EDMONDS
MOUNTLAKE TERRACE
WOODWAY
BRIER
RONALD SEWER DISTRICT
SCRIBER LAKE
HALLS LAKE
LAKE BALLINGER
HOLYROOD CEMETERY
MAIN ST
BOWDOIN WAY
208TH ST S.W.
212TH ST. S.W.
244TH ST. S.W.
205TH ST.
196TH ST S.W.
SNOHOMISH COUNTY
KING COUNTY
U.S. 5 (FREEWAY)
HWY 99
AURORA AVE.
48TH AVE. W.
CEDAR WAY
EDMONDS WAY
METER STA. "A"
METER STA. "B"
METER STA. "C"
METER STA. "D"
METER STA. "E"
TRUNK SEWER UNIT 10
TRUNK SEWER UNIT 7-A
PUMP STATION UNIT 8
FORCE MAIN UNIT 9
E-1
E-2
E-3
E-4
E-5
O-1
O-2
O-3
O-4
O-5
R-1
R-2
R-3
M-1
M-2
LEGEND
PRESENT CITY LIMITS OF EDMONDS & MOUNTLAKE TERRACE
AREAS PRESENTLY SEWERED TO THE EDMONDS TREATMENT PLANT
SEWER TRUNK.

Exhibit G

Preliminary Project Cost Estimates

CURRENT PROJECT COST ESTIMATE

CONSTRUCTION COSTS	
1990 Construction Costs	$27,850,000
Sales Tax	2,520,000
Contingency	3,650,000
	$34,020,000
- Est. VE Savings	- 79,000
Subtotal	$33,941,000
ALLIED COSTS	
Engineering	
Predesign	320,674
Design	1,969,384
Construction	1,867,412
Legal	75,000
City Administration	200,000
Misc. and Contingency	
Value Engineering	85,000
Contingency	482,530
Subtotal	$5,000,000
TOTAL	$38,941,000

Potential Added Cost to Cover N. Clarifier

CONSTRUCTION	400,000
ENGINEERING	29,300
TOTAL, INCL. OPTION	$39,370,300

G.2 Agreement between City of Edmonds and Municipality of Seattle – July 20, 1988

RECEIVED
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ENGINEERING

CITY OF EDMONDS

MUNICIPALITY OF METROPOLITAN SEATTLE

AGREEMENT FOR RECIPROCAL
SEWAGE TREATMENT AND DISPOSAL

THIS AGREEMENT, made as of the 20th day of July, 1988 between the City of Edmonds, a municipal corporation of the State of Washington (hereinafter referred to as "Edmonds") and the Municipality of Metropolitan Seattle, a metropolitan municipal corporation of the State of Washington (hereinafter referred to as "Metro");

W I T N E S S E T H:

WHEREAS, Edmonds and Metro own and operate separate facilities for sewage treatment and disposal in adjacent sewer service areas and have determined to upgrade those facilities to a higher degree of treatment to comply with the State and Federal Clean Water Acts; and

WHEREAS, the City of Mountlake Terrace has been ordered by the State of Washington to make reliability improvements to the sewage pumping station that delivers its sewage to Edmonds' wastewater treatment facilities from the eastern portion of Edmonds sewer service area; and

WHEREAS, Metro can deliver sewage from its Richmond Beach service area to Edmonds' sewage treatment plant and deliver sewage from the eastern portion of Edmonds' service area to its West Point sewage treatment plant at a cost generally comparable with upgrading its Richmond Beach treatment plant and can, under such an arrangement, reduce the size of the Richmond Beach plant and convert it to a sewage pumping station; and

WHEREAS, construction of conveyance facilities necessary to effect said delivery would result in abandonment, replacement and upgrading of the aforementioned Mountlake Terrace pumping

824
CON-5-28
7-20-88 to 7-1-2036

[illegible] Classification Letter

station and would also reduce the amount of sewage pumped by Edmonds from the eastern portion of Edmonds' service area; and

WHEREAS, Metro and Edmonds have determined that it is in the best public interest to enter into an agreement for the delivery by Metro of sewage that would otherwise be treated at its Richmond Beach plant to Edmonds and delivery of an equal quantity of Edmonds' sewage from the eastern portion of its service area to Metro as previously described;

NOW, THEREFORE, in consideration of the mutual covenants and assurances described herein, it is hereby agreed as follows:

SECTION 1. Sewage Treatment by Edmonds. Edmonds will accept, and be totally responsible for treatment and disposal of all sewage delivered to its treatment plant from Metro's Richmond Beach service area (hereinafter "Richmond Beach"), which is delineated on Exhibit A attached hereto.

SECTION 2. Sewage Treatment by Metro. Metro will accept, and be totally responsible for treatment and disposal of sewage from the eastern portion of Edmonds' sewer service area (hereinafter "Edmonds East"), which is delineated on Exhibit B attached hereto, in an amount equal to the sewage delivered to Edmonds' treatment plant pursuant to Section 1. The term "equal" shall mean that the volume of sewage flow accepted by Metro pursuant to this Section 2 shall, in a calendar year (January 1 to December 31), be within five percent (5%) of the volume accepted by Edmonds pursuant to Section 1 hereof. Metro will, to the degree possible given technical limitations inherent in the design and operation of sewage pumping stations, cause the volume of sewage flow accepted by the parties from the respective service areas to be equal on a monthly and weekly basis.

If, in any calendar year, the total volume of sewage flow generated in Edmonds East is less than the volume of sewage delivered to Edmonds pursuant to Section 1, thereby making impossible acceptance of an equal amount of sewage by Metro

as provided in this Section 2, Metro will pay Edmonds annually for treatment of the excess flows delivered to Edmonds by Metro, said payment to be a percentage of Edmonds operation, maintenance and capital costs determined in the same manner that monthly payments would be determined pursuant to Section 9.

SECTION 3. Sewage Treatment Costs. Sewage treatment and disposal costs incurred by either party shall be paid by that party and, except as otherwise specifically provided in this agreement, no monetary payments shall be made by one party to the other for such purposes.

SECTION 4. Construction and Operation of Conveyance Facilities. Except as provided in Section 5, Metro will be responsible for construction, ownership, operation and, maintenance of all facilities necessary to deliver Richmond Beach sewage to Edmonds and Edmonds East sewage to Metro as described in Sections 1 and 2, including all equipment, controls and mechanisms for monitoring the flows delivered to Edmonds and monitoring and regulating the flows accepted by Metro. Edmonds will cooperate in the procurement of permits and rights of way necessary to construct said facilities and will be identified as co-applicant in the application for said permits if so requested by Metro.

Edmonds shall be provided with the opportunity to review plans for the sewage pumping station to be constructed as part of the facilities necessary to deliver Edmonds East sewage to Metro and may make recommendations regarding the design of said station including the controls and mechanisms for monitoring and regulating flows.

It is anticipated that the facilities constructed by Metro pursuant to this Section 4 will intercept Edmonds East sewage at or near the site of the existing Edmonds-Mountlake Terrace Lake Ballinger Pumping Station. Metro will not, at any time, have any responsibility for operation, maintenance, repair or replacement of any sewage facilities upstream from said station and/or said point of interception.

SECTION 5. Pumping Station Cost Share. The sewage pumping station constructed by Metro as part of the conveyance facilities necessary to deliver sewage from Edmonds East to Metro treatment facilities will also be designed and constructed to pump that amount of sewage to Edmonds that exceeds the amount accepted by Metro pursuant to Section 2. Edmonds shall reimburse Metro annually for that portion of the total capital, operation and maintenance cost of the pumping station incurred to pump sewage to the Edmonds sewage treatment plant. From and after the date that Metro begins accepting sewage from Edmonds East pursuant to Section 2, the amount of Edmonds reimbursement will be determined and paid in the following manner.

The annual capital cost payable by Edmonds to Metro will be determined by multiplying the annual debt service and any additional annual capital costs for said pumping station by the percentage of the total sewage flow pumped by said station that exceeds the volume of sewage flow delivered to Edmonds by Metro pursuant to Section 1. The annual operation and maintenance cost payable by Edmonds to Metro shall be determined by multiplying the total annual operation and maintenance cost for the pumping station by the percentage of total sewage flow pumped by said station that exceeds the volume of sewage flow delivered to Edmonds by Metro pursuant to Section 1. Debt service cost in this section shall mean the portion of Metro's total annual debt service cost represented by the total project cost of the pumping station minus any grants-in-aid applied to the pumping station project.

The parties anticipate that the pumping station described in this section, along with the force main and gravity sewer necessary to connect said station to existing Metro facilities, will be constructed and placed in operation prior to the time that Metro accepts Edmonds East flows pursuant to Section 2 for the sole purpose of transporting Edmonds East flows to

Edmonds. From the time that the sewage pumping station described in this Section 5 is placed in operation and until such time that Metro accepts Edmonds East sewage flows as described in Section 2, Edmonds shall reimburse Metro annually for the total annual operation, maintenance and debt service costs for said station.

In this event, Edmonds shall also pay to Metro a portion of the cost of moving up from 1995 the date of construction of the force main and gravity sewer necessary to connect the pumping station to Metro's existing McAleer trunk. Edmonds' payment shall be determined in the following manner.

The actual total project cost of said force main and gravity sewer minus any grants-in-aid shall be inflated at the rate of six percent (6%) annually from the year of construction to the year 1995 and then discounted back from 1995 to the year of construction at the rate of eight and one half percent (8.5%) annually. The difference between the figure so determined and the actual project cost shall constitute the cost of moving up the date of construction. Said cost shall then be divided into equal annual increments from the year of construction to 1995 and interest at the rate of 8.5% annually shall be added. Edmonds shall then pay to Metro annually a percentage of each annual increment and interest equal to the percentage of total pumping station sewage flow that exceeds the volume of sewage flow that is delivered by Metro pursuant to Section 1.

Payment of the reimbursement amount shall be made to Metro within 60 days of receipt of a properly documented invoice.

SECTION 6. Emergency Overflows. Metro will accept Edmonds East sewage flows in excess of the limits described in Section 2 on an emergency basis subject to the capability of Metro conveyance facilities to accept such flows. The term "emergency" shall mean the temporary inability, due to breakage or malfunction, of Edmonds' sewage conveyance and/or treatment

facilities to accept the sewage that would otherwise be pumped into Edmonds' facilities by the sewage pumping station described in Section 5. Acceptance of emergency flows will be subject to payment by Edmonds of the percentage of the total operation maintenance and capital costs of Metro conveyance and treatment facilities that the emergency overflow constitutes of the total sewage flow treated by Metro for each month that the emergency overflows are accepted. Metro shall have no responsibility for emergency overflows that exceed the capacity of Metro's McAleer Trunk sewer.

Edmonds will accept the Edmonds East sewage flows described in Section 2 on an emergency basis subject to the capability of Edmonds conveyance and treatment facilities to accept such flows. The term "emergency" shall mean the temporary inability, due to breakage or malfunction, of Metro conveyance facilities to accept sewage that would otherwise be accepted into Metro facilities. Acceptance of emergency flows will be subject to payment by Metro of the percentage of the total operation, maintenance and capital cost of the Edmonds treatment plant that the emergency overflow constitutes of the total sewage flow treated by Edmonds for each month that the emergency overflows are delivered.

Metro and Edmonds may temporarily divert sewage flows into each others' sewage conveyance facilities for other than emergency purposes and develop terms and conditions therefore when and if both parties mutually determine that it is in their best interests to do so.

SECTION 7. Regulation of Discharges. Edmonds East sewage flows and their sources shall be subject to such reasonable rules and regulations as have been or may be adopted from time to time by the Metropolitan Council for purposes of regulating the nature and quality of wastes discharged into Metro sewage facilities. Edmonds shall assist and cooperate with Metro's

efforts to regulate industrial discharges in Edmonds East and for such purposes will vest with Metro any authority that can legally be delegated and will consider for adoption any necessary revisions or additions to Edmonds rules and regulations governing sewage and industrial wastes.

Edmonds further agrees to exercise appropriate authority to ensure that all industrial waste shall receive proper treatment before being discharged into any sewers that are tributary to Metro sewage facilities. For the purposes of this section, "proper treatment" means that such industrial wastes shall be treated in accordance with Metro Council Resolution Nos. 3374 and 4530, dealing with industrial wastes and waste discharge permits, together with any subsequent amendments thereto, or in accordance with such ordinances as Edmonds may adopt for purposes of ensuring pretreatment of industrial wastes. The term "industrial waste" shall have the meaning set forth in Metro Council Resolution No. 3374 and such ordinances as Edmonds may adopt for purposes of regulating discharges into public sewers. The ability of any source to discharge industrial waste into sewers that are tributary to Metro sewage facilities shall be expressly contingent upon Metro's issuance of a waste discharge permit to that source and payment of any permit fees that Metro may require. Metro reserves the right to refuse to accept any industrial waste from any source that fails to secure a waste discharge permit or violates any terms or conditions of such a permit.

Metro will cooperate with Edmonds in its efforts to regulate the nature and quality of wastes discharged from Richmond Beach to its treatment plant and for such purposes shall vest with Edmonds any authority that can legally be delegated and will consider for adoption any necessary revisions to Metro's rules and regulations governing sewage and industrial wastes. Discharges in the Richmond Beach service area shall continue to be subject to the same prohibitions, restrictions and pretreatment

requirements as discharges into Metro sewage treatment facilities in addition to the requirements of such reasonable rules and regulations as may be applied by Edmonds throughout its sewer service area for such purposes.

The parties intend, by this provision of the agreement, to insure compliance with local, state and federal laws applicable to the sewage flows being exchanged and cooperative enforcement of the parties respective industrial waste regulations.

SECTION 8. High Strength Wastes. Edmonds shall pay to Metro a surcharge for high strength discharges in Edmonds East equal to 50 percent of that amount that would be payable pursuant to Metro Council Resolution No. 2557 together with any subsequent amendments thereto, until January 1, 2010 and 60 percent thereafter; said percentage representing the estimated proportion of Edmonds East high strength wastes that will be treated by Metro pursuant to Section 2 based on current projections of sewage flows. The surcharge will be billed and collected by Edmonds in the same manner that the surcharge is billed and collected by Metro's component agencies. Direct measurement as required by Resolution No. 2557 will be undertaken by Metro.

Edmonds and Metro may agree to adjust the foregoing percentages from time to time to reflect actual sewage flows.

SECTION 9. Implementation Schedule. Edmonds will make every reasonable effort to complete construction of treatment facilities necessary to accept and provide legally prescribed levels of sewage treatment for Richmond Beach sewage flows by December 31, 1991 and Metro will make every reasonable effort to complete construction of treatment facilities necessary to accept and provide legally prescribed levels of sewage treatment for Edmonds East sewage flows by December 31, 1995; it being the intent of the parties that the respective sewage flows receive treatment in accordance with state and federal laws.

Metro will also make every reasonable effort to complete the pumping station, force main and gravity sewer described

in Section 5 by December 31, 1991.

The parties acknowledge that completion of construction of one of the conveyance systems before the other and/or requirements of regulatory agencies regarding level of treatment of flows in the respective service areas will likely result in simultaneous treatment by Edmonds of all flows from Richmond Beach and all flows from Edmonds East on an interim basis. If, for any reason, Metro delivers wastewater flows to Edmonds as described in Section 1 prior to the time it accepts wastewater flows from Edmonds as described in Section 2, Edmonds will accept said flows subject to monthly payment by Metro of the percentage of the total operation, maintenance and capital costs of the Edmonds wastewater treatment plant that the Metro delivered flow constitutes of the total sewage flow treated by Edmonds for each month that the Metro flows are delivered.

SECTION 10. Grants. In the event that Metro receives any grants-in-aid for construction of any of the facilities described in Section 4 said grants, for purposes of this agreement, shall be applied proportionally to all facilities or facility elements described in Section 4.

Any determinations of total capital costs for Edmonds wastewater treatment facilities that may be made for purposes of formulating charges to Metro pursuant to Sections 6 and 7 shall exclude grant funded capital costs.

SECTION 11. Legal Relations. Any liability incurred by Metro as a result of construction and operation of the conveyance facilities described in Section 4 shall be the sole liability of Metro and any liability incurred by Edmonds as a result of construction and operation of sewage treatment facilities in Edmonds shall be the sole liability of Edmonds.

Edmonds will hold Metro harmless from any penalty imposed upon Edmonds by appropriate regulatory agencies for failure to provide prescribed levels of sewage treatment within legally prescribed deadlines.

Metro will hold Edmonds harmless from any penalty imposed upon Metro by appropriate regulatory agencies for failure to provide prescribed levels of sewage treatment within legally prescribed deadlines.

SECTION 12. EIS Permits and Public Information. Both Metro and Edmonds recognize that the planning and implementation of the new sewage conveyance facilities contemplated by this Agreement will require mutual cooperation and support. Edmonds hereby agrees to use its best efforts to assist Metro in the preparation and filing of applications for such permits and rights-of-way as may be requested by Edmonds and other jurisdictions in Snohomish County for the project facilities and to consider and act on any such applications to Edmonds as soon as practicable. If so requested by Metro, Edmonds shall be identified as a co-applicant for permits and approvals associated with the project, jointly issue environmental documents and attend and participate in such public hearings and public meetings in Snohomish County as Metro may deem appropriate.

SECTION 13. Dispute Resolution. In the event disputes or claims arise over the interpretation, enforcement or effect of this Agreement, either party may refer the matter to a committee composed of Metro's Executive Director or his/her designee and its Director of Water Pollution Control and the Mayor of the City of Edmonds and its Community Services Director for resolution. The consideration of the dispute or claim by this committee, in an effort to reach a solution which reflects the best public interest, shall be a prerequisite to any legal action by either party.

SECTION 14. Term of Agreement. This agreement shall remain in full force and effect until July 1, 2036 and shall be binding on the successors and assigns of both parties.

SECTION 15. Existing and Future Sewage Disposal Arrangements. The parties acknowledge that Edmonds, by agreement with Ronald

Sewer District, currently provides sewage disposal service for an area inside Metro's boundaries and Metro currently provides sewage disposal service in areas outside its boundaries in Snohomish County and that precedent therefore exists for sewage disposal arrangements that transcend the jurisdictional boundaries of each of the parties.

The parties further acknowledge that there may be future extrajurisdictional arrangements for sewage disposal established by or affecting the parties and that this agreement may be amended during its term by mutual consent of the parties to facilitate or conform to such arrangements.

IN WITNESS WHEREOF, the parties have executed this agreement as of the date written above.

City of Edmonds

Mayor

Attest:

Charles D. Day

Municipality of Metropolitan

Executive Director

Attest:

Bonnie Nelson

Clerk of the Council

G.3 Agreement between City of Edmonds and King County – October 6, 2000

CITY OF EDMONDS

KING COUNTY

AGREEMENT FOR SEWAGE TREATMENT

THIS AGREEMENT, made as of the 6th day of October, 2000 between the City of Edmonds, a municipal corporation of the State of Washington (hereinafter "Edmonds") and King County, a political subdivision of the State of Washington (hereinafter "the County");

WHEREAS, the parties have entered into an agreement for reciprocal sewage treatment dated July 20, 1988 and amended March 24, 1993 that provided for treatment of sewage from the County's Richmond Beach service area by Edmonds and treatment of sewage from the eastern portion of Edmonds service area by the County; and

WHEREAS, said agreement also provided for simultaneous treatment of sewage from each of the two above mentioned service areas by Edmonds before implementing reciprocal sewage treatment as contemplated by that agreement; and

WHEREAS; the parties now desire to more specifically determine the time period during which Edmonds will treat sewage from both service areas and modify the terms and conditions related to Edmonds treatment of sewage from both areas;

NOW, THEREFORE, IT IS HEREBY AGREED AS FOLLOWS:

SECTION 1. Earlier Agreement Superceded. The Agreement for Reciprocal Sewage Treatment entered into by the City of Edmonds and the Municipality of Metropolitan Seattle (predecessor to King County) July 20, 1988 and amended March 24, 1993 is hereby superceded by this agreement.

SECTION 2. Sewage Treatment by Edmonds. From January 1, 2000 until July 1, 2036 Edmonds will accept and be totally responsible for treatment and disposal of all sewage delivered to its treatment plant from the County's Richmond Beach service area (hereinafter Richmond Beach) which is delineated on Exhibit A attached hereto and includes most of the Town of Woodway.

From January 1, 2000 until January 1, 2012 Edmonds will also treat all sewage that is conveyed to the Edmonds treatment plant by the County's Lake Ballinger Pumping Station from the eastern portion of Edmonds' service area (hereinafter "Edmonds East"), which is delineated on Exhibit B attached hereto,

SECTION 3. Payment Schedule. Except as provided in Section 11, payments from one party to the other that are required or provided for by this Agreement shall be made quarterly following submittal and receipt of appropriate invoices.

SECTION 4. Payment to Edmonds. During the period of time that Edmonds treats sewage from both the Richmond Beach and Edmonds East service areas as described in Section 2, the County will pay Edmonds for treatment of the sewage delivered from Richmond Beach in the following manner:

The County will pay Edmonds for the percentage of the total operation and maintenance cost of the Edmonds Wastewater Treatment Plant that the Richmond Beach sewage flow constitutes of the total sewage flow treated by Edmonds at its plant. The County shall also pay to Edmonds $100,000 per year as a contribution to debt service and capital costs of the Edmonds treatment plant. For purposes of this agreement sewage flows from the Ballinger Commons Apartments shall be added to, and considered part of, the Richmond Beach sewage flows.

SECTION 5. Reciprocal Sewage Treatment. From January 1, 2012 (or some other date as may be determined pursuant to Section 11) until July 1, 2036 the County will divert and

accept into the County's wastewater treatment system sewage flow from Edmonds East in an amount equal to the sewage flow delivered to the Edmonds treatment plant from Richmond Beach pursuant to Section 2. The term "equal" shall mean that the volume of sewage accepted into the county's system from Edmonds East shall, in a calendar year, be within 5% of the volume delivered to Edmonds from Richmond Beach. The County will, subject to operational limitations at its Richmond Beach and Lake Ballinger Pumping Stations, cause the sewage volumes accepted by the parties from the respective service areas to be equal on a weekly and monthly basis.

Except as provided in Section 9, no payment shall be made to Edmonds for the treatment of Richmond Beach sewage during the time that Edmonds East sewage is diverted into the County's wastewater system as provided in Sections 5 and 6.

SECTION 6. Reciprocal Sewage Treatment Summer Option. The County may, at its sole option, divert Edmonds East wastewater into the County's system as described in Section 5 on a temporary basis in any year before 2012 for up to six summer months beginning no earlier than May 1 and ending no later than November 1. The County shall provide at least 30 days notice to Edmonds before diverting wastewater as described in this Section 6.

SECTION 7. Temporary Flow Diversions. During the time that Edmonds is treating flows from both service areas as provided in Section 2 the County will accept sewage flows from Edmonds East on a temporary basis if Edmonds is unable, due to malfunction or operating constraints in the Edmonds sewage conveyance system or treatment plant, to accept that sewage flow. In this event, Edmonds will pay the County $700 per million gallons of sewage flow accepted by the County. Said fee shall increase 2% every year after 2000.

During the time that reciprocal sewage treatment is undertaken in accordance with

Section 5 the County will accept sewage flows on a temporary basis in excess of the volume that it accepts pursuant to that section for those same reasons identified immediately above. Following such a diversion, the County will make a reasonable effort to cause the total monthly sewage volume diverted into the County's wastewater treatment system to be equal (as defined in Section 5) to the volume delivered to Edmonds from Richmond Beach. If the County is unable to make said volume equal, Edmonds will pay the County a fee at the same rate described above.

During the time that reciprocal sewage treatment is undertaken Edmonds will accept Edmonds East flows for which the County has treatment responsibility on a temporary basis if the County, due to malfunction or capacity constraints in its sewage conveyance and treatment system, is unable to accept that sewage flow. In that event, the County will pay Edmonds the same fee described above.

The parties may also divert flows into each other's sewage conveyance facilities for reasons other than those described above under such terms and conditions they deem appropriate when they mutually determine that it is in their best interests to do so. The responsibility of either party to accept flows described in this section is subject to the physical capability of the respective sewage conveyance and treatment systems to accept those flows.

SECTION 8. Regulation of Discharges. Edmonds East sewage flows and their sources shall be subject to the rules and regulations applicable to the treatment plant that treats those flows. When Edmonds east sewage is treated by the County, such sewage flows shall be subject the County's rules and regulations and Edmonds shall cooperate with the County's efforts to regulate industrial discharges in Edmonds East. When Edmonds East sewage is treated by Edmonds, such sewage flows shall be subject to the rules and regulations of Edmonds and/or the

Washington Department of Ecology. During periods of reciprocal sewage treatment King County and the Washington Department of Ecology shall cooperatively regulate industrial discharges in Edmonds East. The ability of any source to discharge industrial waste into Edmonds East sewers shall be expressly contingent upon issuance of a Waste Discharge Permit to that source by the County and/or the Washington Department of Ecology.

Richmond Beach sewage flows and their sources shall be subject to such rules and regulations as may be adopted by Edmonds and/or Ecology for the purpose of regulating the nature and quality of wastes into Edmonds' treatment plant. King County shall cooperate with Edmonds' and/or Ecology's efforts to regulate industrial discharges in Richmond Beach.

The parties intend, by this Section 8, to ensure compliance with local, state and U.S. laws applicable to the sewage flows being exchanged and cooperative enforcement of the parties' respective industrial waste regulations.

SECTION 9. High Strength Waste. During any period of time that Edmonds East sewage is treated by the County, Edmonds shall pay to the County a surcharge for high strength discharges in Edmonds East. Said payment shall be equal to 55% of the amount that would be payable under King County Ordinance 11034 and any subsequent amendments. Direct measurement as required by King County Ordinance 11034 will be undertaken by the County.

The County shall pay to Edmonds a surcharge for high strength discharges in Richmond Beach in accordance with such ordinances as may be adopted by the Edmonds City Council for the purpose of establishing high strength waste surcharges in the Edmonds sewage treatment service area.

SECTION 10. Pumping Station Cost Share. During the time that Edmonds treats sewage flows from both Edmonds East and Richmond Beach, Edmonds shall reimburse the County for

the total operation and maintenance cost of the County's Lake Ballinger Pumping Station incurred to pump sewage to the Edmonds Wastewater Treatment Plant. Said reimbursement shall be reduced, however, by the percentage of said cost that reflect the percentage of total flows pumped by said station from Ballinger Commons Apartments.

During periods of reciprocal sewage treatment Edmonds shall reimburse the County for the portion of the operation and maintenance cost of said pumping station that reflects the percentage of total sewage flow pumped to Edmonds that exceeds the volume delivered to Edmonds by the County from Richmond Beach. The specific formula follows: Volume pumped via Ballinger to Edmonds (A) *minus* volume delivered to Edmonds from Richmond Beach (B) *equals* C. C *divided* by A *equals* X. Operation and maintenance cost *multiplied* by X *equals* Edmonds payment for operation and maintenance.

During both of the sewage treatment arrangements described in this section, Edmonds shall pay the portion of the County's annual debt service costs on said pumping station that reflects the percentage of total flow pumped to Edmonds that exceeds the volume delivered to Edmonds by the County from Richmond Beach. The same specific formula described in the immediately preceding paragraph shall be used to determine the amount to be paid to the County.

"Annual debt service costs" as used in this section shall not include any additional percentage of those costs for debt service coverage requirements applicable to the County's bonded debt.

SECTION 11. Review of Terms and Conditions in Sections 2 and 3. Any time after January 1, 2006 either party may request a review of the terms and conditions in Sections 2 or 3. Any changes in those terms and conditions shall be by amendment to this agreement except for extension of the time frame described in Section 2 which may be extended beyond January 1,

2012 by simple written concurrence of the parties. Said extension by simple written concurrence shall not however, extend beyond July 1, 2036.

Section 12. Reimbursement for Capital Costs at Edmonds Treatment Plant. The County acknowledges its obligation to reimburse Edmonds for a share of certain capital costs incurred by Edmonds at its treatment plant during the effective period of the prior agreement between the parties for reciprocal sewage treatment. The parties have determined said amount to be $250,000 which shall be paid by the County to Edmonds in two annual installments of $125,000 each. The county shall make the first payment to Edmonds within 45 days of execution of this agreement.

SECTION 13. Legal Relations. Any liability incurred by the County resulting from operation of its wastewater conveyance and treatment facilities shall be the sole responsibility of the County. Any liability incurred by Edmonds resulting from operation of its wastewater conveyance and treatment facilities shall be the sole responsibility of Edmonds.

The parties acknowledge their obligation to comply with lawful orders with the state or federal agencies with jurisdictions or a court of competent jurisdiction. The obligations and rights established by this agreement shall be interpreted accordingly to assure compliance with the terms with such an order.

SECTION 14. Dispute Resolution. In the event disputes or claims arise over the interpretation, enforcement or effect of this agreement, either party may refer this matter to a committee composed of the Director of King County's Department of Natural Resources or his/her designee and its Manager of Wastewater Treatment and the Mayor of the City of Edmonds or his/her designee and its Public Works Director for resolution. The consideration of the dispute or claim by this committee, in an effort to reach a solution which reflects the best public interest, shall be a prerequisite to any legal action by either party.

SECTION 15. Term of Agreement. This agreement shall take effect April 1, 2000 and

remain in full force and effect until July1, 2036. This agreement shall be binding on the successors and assigns of both parties.

IN WITNESS WHEREOF, the parties have executed this agreement as of the date first written above.

City of Edmonds

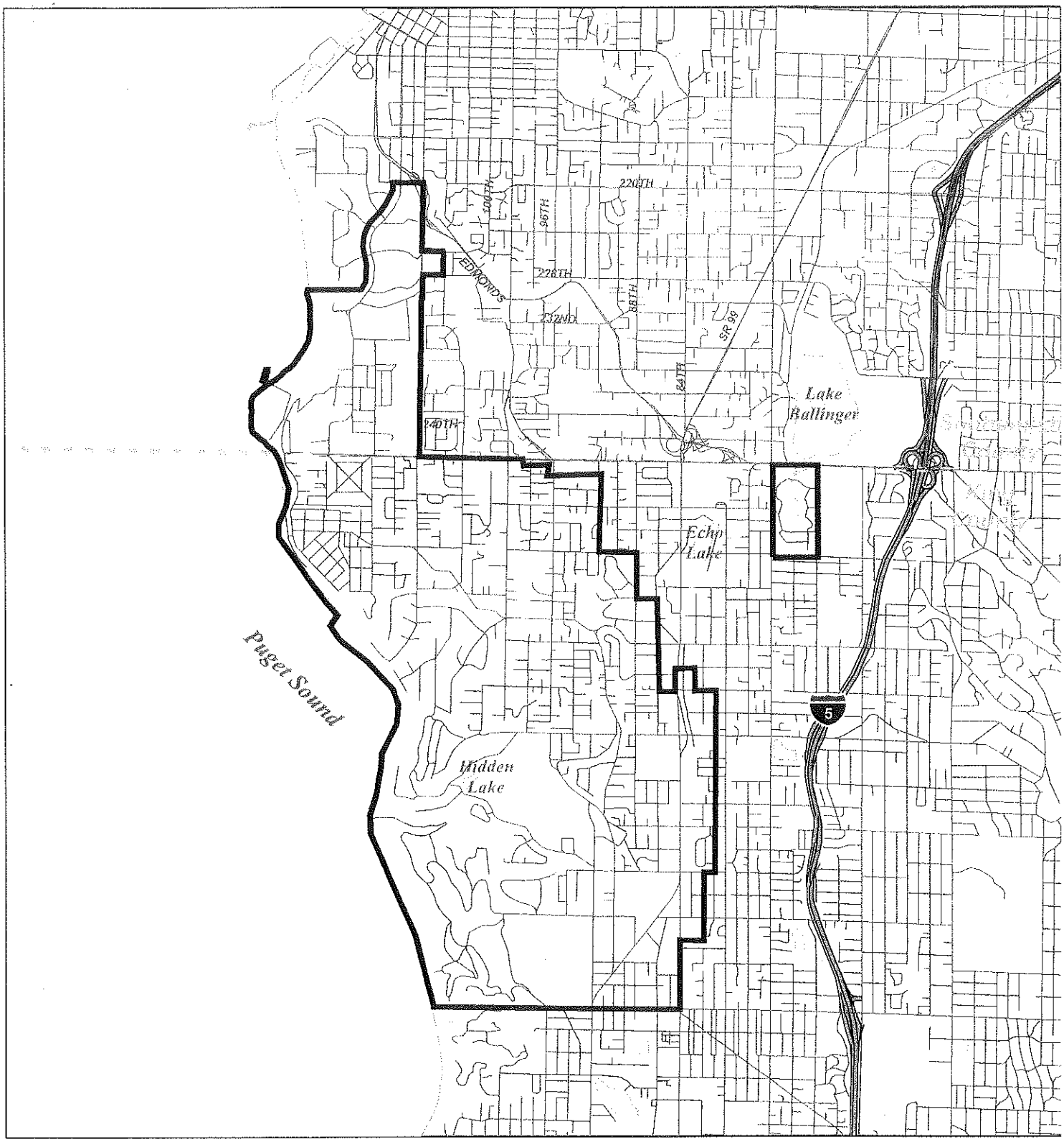
Mayor

Attest:

King County

Director, Department of Natural Resources

Attest:



Richmond Beach Service Area

Exhibit A

Map produced by GIS staff, Wastewater Treatment Division (WTD), King County Department of Natural Resources. WTD disclaims any warranty for use of this digital product beyond that for which it was designed. Neither this digital product, nor any portion thereof may be reproduced in any form or by any means without the expressed written authorization of WTD. This document includes data copyrighted by the Kroll Map Company and is being used with their permission. Use is restricted.

KING COUNTY

1000 0 1000 2000 3000 4000 Feet

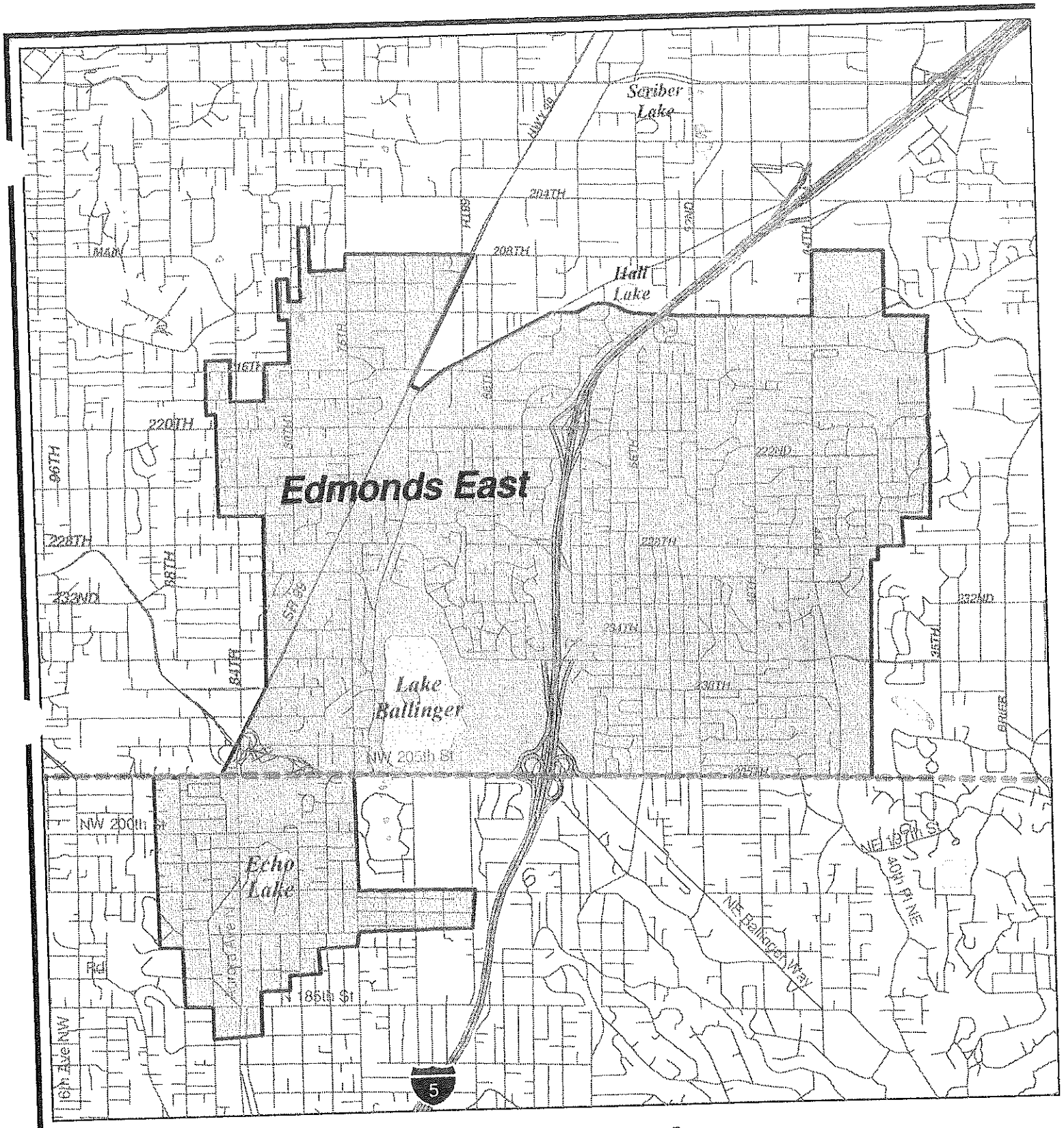
N W E S

January 11, 2001

Legend

- Richmond Beach Service Boundary
- Streets
- County Line
- Freeways
- Water Features

I:\GIS\PROJECTS\EDMONDS\PROJECTS\HIRSCH.APR



Edmonds East Service Area

Exhibit B

Map produced by GIS staff, Wastewater Treatment Division (WTD), King County Department of Natural Resources. WTD disclaims any warranty for use of this digital product beyond that for which it was designed. Neither this digital product, nor any portion thereof may be reproduced in any form or by any means without the expressed written authorization of WTD. This document includes data copyrighted by the Kroll Map Company and is being used with their permission. Use is restricted.

KING COUNTY

1000 0 1000 2000 3000 Feet

May 18, 2000

Streets
County Line
Freeways
Water Features
Edmonds East Basin

G.4 Agreement between City of Edmonds and City of Lynnwood – October 26, 1982

AGREEMENT FOR JOINT USE OF SANITARY SEWERAGE FACILITIES

BETWEEN CITY OF EDMONDS & CITY OF LYNNWOOD

TRUNKS - TREATMENT - DISPOSAL

THIS AGREEMENT, made and executed this 26th day of October, 1982, by and between the CITIES OF LYNNWOOD and EDMONDS, hereinafter referred to as "Lynnwood" and "Edmonds", both being municipal corporations of the State of Washington and located in Snohomish County, Washington.

WITNESSETH:

WHEREAS, on August 5, 1965, Lynnwood and Edmonds did enter into an agreement for the joint use of certain sanitary sewage disposal facilities, including a system of trunk sewers, a sewage treatment plant and a deep water outfall sewer line, presently owned and operated by Lynnwood; and

WHEREAS, on November 20, 1972, said agreement was modified under Amendment No. 1, by mutual agreement between Lynnwood and Edmonds to provide for additional capacity in, and use by, Edmonds of certain trunk sewers presently owned and operated by Lynnwood; and

WHEREAS, the said agreements established, among other things, the apportionment of capital costs of those certain sanitary sewage disposal facilities for which each party would be responsible, and the capacity of such facilities that would be reserved to each party; and

WHEREAS, under the said agreements Edmonds advanced the amount of approximately $128,095.40 as Edmonds' fair share of the

capital costs of the said facilities, and certain capacities of such facilities were so reserved for the use of Edmonds as described hereinafter and as indicated on Exhibits A, C, and D attached hereto, and by this reference incorporated herein; and

WHEREAS, the Cities of Edmonds and Lynnwood have a mutual need of, and have requested from each other, sanitary sewerage service for the areas designated as:

AREA E1 - City of Edmonds area served by City of Lynnwood treatment facility and trunkage system.

AREA L2 - City of Lynnwood area served by City of Lynnwood treatment facility, and trunkage systems owned by City of Lynnwood and City of Edmonds.

AREA L3 - City of Lynnwood area served by City of Edmonds treatment facility and trunkage system.

All as described hereinafter and as indicated on Exhibits A and B, attached hereto, and by this reference incorporated herein; and

WHEREAS, service to these areas may be conveniently provided by gravity flow, or by pumping can be economically made to flow into the other respective City's existing sewer system; and

WHEREAS, the Agreement of August 5, 1965 and the Amendment No. 1 of November 20, 1972 did not provide for capacity in and use of the sewer trunks to all of these areas; and

WHEREAS, it has been determined that these areas are within the drainage basins to the respective treatment facilities, and logical extensions of existing joint sewer trunk systems thereto; and

WHEREAS, under conditions actually experienced subsequent to

the entering into of said agreements, it is now found necessary to more clearly define the limits of said drainage basins and to more clearly describe the respective cities' joint sanitary sewage disposal facilities; and

WHEREAS, under the said agreements, it has been determined that Edmonds now has sufficient capacity reserved in Lynnwood's sewage treatment plant and outfall sewer line to serve AREA E1, but that by reason of an ambiguity in the previous trunk sewer description, Edmonds has insufficient capacity in Lynnwood's system of trunk sewers to serve that portion of AREA E1 hereinafter designated as AREA E1B; and

WHEREAS, LYNNWOOD's need of sanitary sewerage service to AREA L2, and EDMONDS' need of sanitary sewerage service to AREA E1B, may be conveniently provided by a mutually beneficial and equitable exchange of capacity in and joint use of certain existing systems of trunk sewers presently owned, operated and maintained by the other respective City; and

WHEREAS, on October 5, 1971, Edmonds and Mountlake Terrace did enter into an agreement for the joint use of certain sanitary sewage disposal facilities, including a system of trunk sewers, a sewage lift station, a force main, five sewage metering stations, a sewage treatment plant, and a sewer outfall, all presently owned, operated and maintained by Edmonds and Mountlake Terrace as established by said agreement and as described hereinafter and as indicated on Exhibit A and Exhibit C, Part 3, attached hereto, and by this reference incorporated herein; and

WHEREAS, under said agreement on October 5, 1971, Mountlake Terrace did recognize Edmonds' right to provide, through the

joint sewerage system, sanitary sewer service to certain areas including any other areas or agencies which had been theretofore or may be thereafter mutually agreed upon; and both parties agreed that all such areas shall be considered a part of Edmonds for purposes of that contract; and

WHEREAS, on May 12, 1982, Edmonds and Mountlake Terrace did mutually agree to Edmonds providing of such sanitary sewer service to Lynnwood's AREA L3 as hereinbefore designated; and

WHEREAS, the best interests of the residents of Edmonds and Lynnwood require that those certain trunk sewers, treatment facilities and outfall sewer lines be operated and maintained for their mutual benefit as provided herein; and

WHEREAS, it is the desire of both cities to simplify the determination of Maintenance and Operation charges to the respective cities for the joint use of said sanitary sewage facilities; and

WHEREAS, to accomplish the joint treatment and disposal of the sanitary sewage collected by the two parties, it is necessary that a contract be now entered into providing for the operation, maintenance, joint use and the payment therefore, of those certain sewerage works facilities to be so jointly used, and defining the rights, duties and obligations of the parties therein; and

WHEREAS, by reason of these and of other unforeseen circumstances and events, the said agreements of August 5, 1965 and the Amendment No. 1 of November 20, 1972, no longer are deemed suitable nor adequate to fulfill either the original intent or the present and future needs of the parties thereto;

NOW THEREFORE, and in consideration of the promises and the mutual covenants contained herein, the said parties HEREBY ENTER INTO A NEW AGREEMENT AS FOLLOWS:

SECTION 1. DEFINITION OF TERMS. The following words and phases as used in this contract shall have the meanings hereinafter set forth in this section:

(a) The terms "Joint Sewerage Facilities" or "Joint Sewerage System" shall mean all of the facilities heretofore constructed or to be constructed and used jointly by Edmonds and Lynnwood for transporting, treatment and/or disposal of sanitary sewage wastes, all as more particularly described hereinafter and as indicated on Exhibits A and C, attached hereto, and by this reference incorporated herein.

(b-1) The terms "Joint Sewerage Service Area" or "Joint Service Area" shall mean the area ultimately contemplated to be served through the joint sewerage facilities, as described hereinafter and as indicated on Exhibit A, attached hereto, and by this reference incorporated herein.

(b-2) The terms "Edmonds service area" and "Lynnwood service area" shall mean those certain areas lying within the respective corporate limits of each City which will contribute sanitary sewage to the "joint sewerage system" as hereinbefore described. (See also Section 7.)

(c) The term "construction cost" or "capital cost" shall mean all costs of actual construction including the cost of acquistion of real property and/or rights-of-way, engineering design and inspection fees, legal costs, preparation of construction contract documents, disposition of claims incident

to construction, financing costs, including discounts, and other miscellaneous expenses directly attributable to the cost of acquiring and constructing the facilities hereinbefore described and included in the "joint sewerage system", less applicable state and federal grant monies.

(d) The term "operation and maintenance expense" shall mean all expenses for labor, power, light, water, heat, chemicals, materials, supplies, insurance premiums, contract services, tools, equipment, and other miscellaneous expenses directly and properly chargeable to the operation and maintenance of the "joint sewerage system" facilities.

(e) The term "sanitary sewage" or "sewage" shall mean all water-carried wastes that occur as a result of human occupancy or occupation and is normally required to be given special treatment and disposal by the State Regulatory Agencies before being discharged to public waters, and shall not include such wastes as may require other than normal transmission and treatment as is now provided by the "joint sewerage system" facilities. (See also Section 6).

(f) The term "Treatment Plant" or "Sewage Treatment Plant" shall mean the existing sewage treatment plant of the City of Edmonds, or of the City of Lynnwood, as applicable, together with any additions thereto and improvements thereof which may be hereafter constructed or installed.

(g) The term "Outfall Sewer" shall mean the existing sewer and submarine pipeline transporting liquid effluent from Edmonds or Lynnwood sewage treatment plant, as applicable, to point of discharge into deep water in Puget Sound, and any additions

thereto and improvements thereof which hereafter may be constructed or installed.

(h) The abbreviation "MG" shall mean million gallons of sewage or water quantity.

(i) The abbreviation "MGD" shall mean a rate of flow which would result in one million gallons per day of sewage or water quantity.

(j) The term "annual average daily flow" shall mean the total flow of sewage in millions of gallons during a full calendar year in which the joint sewer facilities shall have been used, divided by the number of days in such year, and shall be expressed in MGD.

(k) The term "maximum daily flow" shall mean the total flow of sewage in millions of gallons during that day in each calendar year in which the greater volume of flow in one day occurs, and shall be expressed in MGD; provided, that should an abnormal flow occur on any one day due to temporary conditions which are subsequently corrected, then such abnormal flow shall not be considered.

(l) The "total annual sewage flow" shall mean the total flow of sewage in millions of gallons during a full calendar year in which the joint sewerage facilities shall have been used; and shall be expressed in MG.

(m) The term "total annual water consumption" shall mean the total cubic feet of water billed to a City's users of the joint sewer facilities during a one-year billing cycle, multiplied by 7.48 gallons per cubic foot and divided by one million; and shall be expressed in MG.

(n) The term "sewage flow ratio" or "SFR" shall mean the total annual sewage flow divided by the sum of the total annual water consumptions of the entities using the joint sewer facilities. In AREA L3, the SFR derived for the Lynnwood treatment plant shall be multiplied by the total annual water consumption of the Lynnwood users in AREA L3 to obtain a total annual sewage flow into the Edmonds treatment plant for the purpose of apportioning maintenance and operating expense for such a year.

(o) The term "originating party" shall mean the City in which sewage flow commences, or is produced.

(p) The term "serving city" shall mean that City which provides joint sewerage system service to the other City.

SECTION 2. DELIVERY AND ACCEPTANCE OF SEWAGE. Each party hereto agrees to deliver to the joint sewerage system facilities of the other such sanitary sewage that the originating party deems most economically feasible for the maximum benefits of the customers in its service area, and the other agrees to accept such sewage for transmission, treatment and disposal through the joint sewerage system facilities. Any additional facilities as may be needed to collect and transmit the sewage from the point or points where it is produced to the point of connection to the joint sewerage system facilities shall be constructed, maintained and operated at the sole expense of the originating party. All facilities so constructed by such originating party as well as any additions, extensions, and betterments constructed by and for the other in its service area shall be not less than equal to the

minimum standards as are required by the other.

SECTION 3. PAYMENT FOR USE OF JOINT SEWERAGE SYSTEM FACILITIES. The payment by each party hereto to the other for its use of the joint sewerage system facilities now owned and operated by the other, shall be computed on a fair and reasonable basis as is herein provided for through this contract and which will result in each party bearing its pro rata share of the total costs attributable to the construction, acquisition and operation of the joint sewerage system facilities.

Such payments shall be divided into two parts: (a) Operation and Maintenance charge, and (b) Capital Reimbursement charge. In any and all billings for these charges, they shall be separately stated. Each party will bill the other monthly for the Operation and Maintenance charge and each will remit within thirty (30) days after submittal of the bill. Year-end billing for operation and maintenance expense adjustments, as hereinafter provided, shall be made in April of the following year. Payment by Edmonds to Lynnwood, or by Lynnwood to Edmonds, for Capital Reimbursement charges may be made in a lump sum, sixty (60) days after the signing of this contract by both parties or on either an annual or monthly basis, all as hereinafter provided in Exhibit "E", attached hereto, and by this reference incorporated herein. Total payments for these charges shall include accrued interest at the rate of 8.00% per annum beginning with the date of signature of this agreement by both parties. There shall be no interest on the Operation and Maintenance charge.

(a) Operation and Maintenance Charge:

For the balance of the calendar year of 1982 and through the April 1, 1983 billing, each party will pay the other an Operation and Maintenance charge as hereinafter provided in Exhibit "F", attached hereto, and by this reference incorporated herein.

By March 15, commencing with the year 1983, each party will tabulate the actual operating and maintenance expenses of their own joint sewerage system facilities for the preceeding calendar year. These costs will establish the basis for charges for the current year, which charges shall be changed each year as of April 1. Each party will furnish the other with an itemized listing of all costs along with a tally of the total annual water consumption of all customers being served by such party through the joint sewerage system facilities, and these shall be tabulated on a revised Exhibit "F". The total annual costs as so determined shall be used as the basis of charge for the current year as of April 1, and this figure divided by 12 shall be the rate per month charged by the respective cities.

In April of each year, each City shall bill or credit the other for any differences between total actual billings for preceeding calendar year and billings based on actual cost incurred.

(b) Capital Reimbursement Charges:

In order to reimburse the serving City for a share of the construction cost of the joint sewerage system facilities, the other City shall pay to the serving City a sum which represents a prorata portion of the joint sewerage system unit facility capacity based upon present or future sewage flows, as may be applicable.

The sum to be paid to the serving City by the other City shall be based upon a reimbursement percentage to be computed in the following manner:

$$\frac{\text{Other City Flow}}{\text{Other City Flow} + \text{Serving City Flow}} = \text{Reimbursement Percentage}$$

The sewage flows used in the computation shall be in units of M.G.D. from measurements or derived from present or projected water consumption as hereinbefore described. The reimbursement percentage shall be calculated for each of the separate facilities of the joint sewerage system and when multiplied times the cost of such separate facilities will determine the other City's fair share of the serving City's capital costs expended in constructing such facilities, all as shown on Exhibits "D" and "E", attached hereto. The reimbursement percentage figure when computed based upon either present or estimated future flows shall be used in determining that portion of the design capacity measured in MDG of each of the separate facilities that, with payment of the capital cost, will be reserved to the other City.

In order to amortize a City's share of the capital cost over the remaining specified life of joint sewerage system facilities, said City may elect, as an alternate, to pay the total amount shown on Exhibit "E", in one lump sum payment sixty (60) days after the acceptance and signing of this contract by both parties hereto. In the event this alternate is so selected and declared in writing prior to the 60-day termination date, there shall be added to the lump sum due interest computed at the rate of 8.00% per annum from date of contract signing by both parties to the

payment date.

At such time in the future as it may become necessary for a serving City to provide additional sewerage facilities to increase the capacities of the joint sewerage system, a review of the reserve capacities purchased by the other shall be made with respect to the share of total design capacities of each unit then being used. If, at that time, the other City is using more than its reserve capacity, it shall either purchase additional capacity in the new facilities to be constructed, or in some manner reduce its contributing flows to the level of the reserve capacities purchased under this contract. In the event that the other City is found to be using less than the reserve capacities purchased hereunder, then it may elect to maintain its position and not be required to purchase additional capacities in the new facilities planned, or it may elect to purchase additional capacity as added future reserve, or may elect to sell its excess reserve capacity purchased hereunder and the serving City agrees to purchase same at the original cost to the other. No interest will be included in this buy-back agreement so as to compensate for the depreciation that will have accrued during the other City's holding period. In the event the serving City is required to replace, improve or upgrade any of the joint sewerage system facilities as required to meet State or Federal regulations, then both parties agree to share in such costs in the manner provided for sharing capital costs on the now existing joint sewerage system facilities. In the event the serving City is required to replace any joint sewerage system facilities as a result of a loss in excess of the coverage required in Section 9, then both

parties agree to share in the replacement costs in the manner provided for sharing capital costs on the now existing joint sewerage system facilities.

SECTION 4. RECIPROCAL SERVICE AGREEMENT. In the event any area, presently or in the future, lying within the City limits of either City is most advantageously served through sewerage facilities owned and operated by the other that discharges sewage into the joint sewerage system, the City requesting service is hereby granted the right to use such facilities for the transmission of its sewage. The costs due the serving City from the other for such service and the use of such facilities shall be calculated and regulated in the same manner and style as herein provided for Edmonds' use of Lynnwood's facilities, or Lynnwood's use of Edmonds' facilities. Lynnwood sewage flows through Ballinger Pump Station No. 8 shall be subject to approval by Mountlake Terrace. (See also Section 7.)

SECTION 5. MEASUREMENT OF SEWAGE FLOWS. For the purpose of determining the MGD flow of each City as is being discharged through the joint facilities, the total annual water consumption in MG, of all customers as determined by the use of the most recent amendment to Exhibit "F" as hereinbefore provided, shall be divided into the total flows measured at the treatement plant, a part of the joint sewerage system facilities, and multiplied by each City's average annual water consumption expressed in MGD. Additional metering throughout the joint sewerage system facilities may be performed at the request of either party hereto

and the results of such added metering shall be accepted by both parties. The costs of performing such additional metering shall be borne by the City requesting same.

SECTION 6. CONTROL OF SEWAGE QUALITY. Each of the parties hereto shall be responsible for control of the quality and character of sewage delivered into the joint sewerage system, and to this end shall adopt and enforce suitable rules and regulations to prevent entry into the joint sewerage system of septic sewage, petroleum waste, tar, creosote, naptha, or other chemicals and/or waste detrimental to the proper functioning of the sewage treatment plant and/or elements of the joint sewerage system. Both parties will take whatever means necessary to exclude storm water, roof and surface drainage connections to the sanitary sewers which drain into the joint sewerage system and will not permit entry of sewage waste which had a B.O.D. concentration in excess of that normally found in domestic sewage.

SECTION 7. NONRESIDENT CONNECTIONS. No person or organization shall be permitted to connect to or otherwise make direct use of the joint sewerage system, if said person or organization is not located within the boundaries of one of the parties to this agreement, without the written consent of the parties to this agreement, provided that municipal corporations may so connect with the permission of the City to which facilities it directly connects. For the purpose of allocating operation costs and future expansion of the joint sewerage system facilities as provided hereinbefore, any connection made under

this Section shall become a part of the service area of the City to which it directly connects. Lynnwood sewage flows through Ballinger Pump Station No. 8 shall be subject to approval by Mountlake Terrace. (See also Section 4.)

SECTION 8. AUDIT. Either party to this agreement shall have the right to audit the financial records of the other relevant to this agreement by making written notice at least 30 days prior to said audit. The cost of any such audit shall be at the expense of the party making the request.

SECTION 9. INSURANCE AND LIABILITY DAMAGES. Each City shall maintain insurance on their treatment plants and sewage lift stations in an amount sufficient to enable replacement or restoration of any such facilities damaged or destroyed as a result of casualty or loss normally insured against by sewer utilities operated in a reasonable and prudent manner. The proportionate share of the cost of said insurance applicable to the joint sewerage system shall be included as a part of the operation and maintenance expense and charged to the other. Each of the parties hereto shall also maintain public liability insurance with bodily injury limitations of not less than $500,000 per occurrence and $500,000 aggregate, and property damage limitations of not less than $250,000 per occurrence and $250,000 aggregate.

SECTION 10. ASSIGNMENT. Neither of the parties hereto shall have the right to assign this agreement or any of its rights and

obligations hereunder, nor to terminate its obligations hereunder by dissolution or otherwise, without first securing the written consent of the other party, and this agreement shall be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto.

SECTION 11. NOTICE. Whenever in this agreement notice is required to be given, the same shall be given by registered mail addressed to the party at the following addresses:

City of Edmonds
Civic Center
Edmonds, Washington 98020

City of Lynnwood
City Hall
Lynnwood, Washington 98036

unless a different address shall be hereafter designated in writing by either of such parties.

The date of giving such notice shall be deemed to be the date of mailing thereof. Billings for and payments of operation and maintenance costs may be made by regular mail.

SECTION 12. EXECUTION OF DOCUMENTS AND ADOPTION OF RESOLUTIONS AND ORDINANCES. Each party agrees that it will execute any and all instruments, documents and resolutions or ordinances necessary to give effect to the terms of this contract.

SECTION 13. EFFECTIVE DATE. The provisions of this contract shall become effective on the date hereof, and the charges provided for herein commence on the effective date, unless other

provisions have been made.

SECTION 14. WAIVER. No waiver by either party of any term or condition of this agreement shall be deemed or construed as a waiver of any other term or condition, nor shall a waiver of any breach be deemed to constitute a waiver of any subsequent breach, whether of the same or a different provision of this agreement.

SECTION 15. REMEDIES. In addition to the remedies provided by law, this contract shall be specifically enforceable by either party.

SECTION 16. ENTIRETY. This agreement merges and supersedes all prior negotiations, representations, and agreements between the parties hereto relating to the subject matter hereof, and con-
stitues the entire contract between Edmonds and Lynnwood concerning the disposal of sewage by either City and the acceptance of such sewage by the other for disposal and treatment.

SECTION 17. TERMINATION. This agreement shall remain in effect until its termination is mutually agreed upon by both parties.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

CITY OF LYNNWOOD

By: _____
MAYOR

ATTEST:

_____
CITY CLERK

CITY OF EDMONDS

By: _____
MAYOR

ATTEST:

_____
CITY CLERK

STATE OF WASHINGTON)
)ss
COUNTY OF SNOHOMISH)

On this 26 day of October, 1982, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared

Hanne W. Harrison and

Irene Varney Moran to

me known to be the Mayor and the City Clerk, respectively, of the City of Edmonds, the municipal corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said municipal corporation, for the uses and purposes therein mentioned, and on oath stated that they were authorized to execute the said instrument and that the seal affixed is the official seal of said municipal corporation.

WITNESS my hand and official seal hereto affixed the day and year first above written.

Jacqueline J. Garrett
Notary Public in and for the
State of Washington, residing at
Edmonds

STATE OF WASHINGTON)
)ss
COUNTY OF SNOHOMISH)

On this 26th day of October, 1982, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared

M. J. Hrdlicka and

R. W. Noack to

me known to be the Mayor and the City Clerk, respectively, of the City of Lynnwood, the municipal corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said municipal corporation, for the uses and purposes therein mentioned, and on oath stated that they were authorized to execute the said instrument and that the seal affixed is the official seal of said municipal corporation.

WITNESS my hand and official seal hereto affixed the day and year first above written.

Joanna Ellis
Notary Public in and for the
State of Washington, residing at
Lynnwood, WA

RECEIVED

DEC 6 1989

ENGINEERING

AMENDMENT TO AGREEMENT FOR JOINT USE OF SANITARY SEWERAGE FACILITIES BETWEEN CITY OF EDMONDS AND CITY OF LYNNWOOD

THIS AGREEMENT, made and executed this 23rd day of October, 1989, by and between the Cities of Lynnwood and Edmonds, hereinafter referred to as "Lynnwood" and "Edmonds"; both being municipal corporations of the State of Washington and located in Snohomish County, Washington.

WITNESSETH:

WHEREAS, on October 26, 1982, Edmonds and Lynnwood entered into an agreement to accomplish the joint treatment and disposal of the sanitary sewage collected by the two cities, specifying the operation, maintenance, joint use and the payment thereof for those sewerage works facilities to be jointly used, and defining the rights, duties and obligations of the parties; and

WHEREAS, the October 26, 1982 agreement permits the serving City supplying sewerage facilities to the purchasing City to provide additional sewerage facilities to the purchasing City if the increase is deemed feasible based upon review of the reserve capacities of the serving City; and

WHEREAS, upon Edmonds' inquiry, Lynnwood requested that Edmonds reserve a maximum capacity for Lynnwood at the Edmonds treatment plant of two hundred (200) connections, an increase from the previously allocated one hundred nineteen (119) connections; and

WHEREAS, Edmonds requested that its capacity at the Lynnwood treatment plant be increased from six hundred twenty thousand (620,000) to nine hundred twenty thousand (920,000) gallons per day (hereinafter "gd"); and

WHEREAS, design capacity at the Lynnwood treatment plant was not increased by 300,000 gd for Edmonds; and

WHEREAS, instead of increasing the capacity, a diversion of Lynnwood flows will be made to vacate enough capacity at the Lynnwood treatment plant to accommodate up to three hundred thousand (300,000) additional gd for Edmonds; and

WHEREAS, Edmonds treatment plant has the capacity to accommodate a diversion of up to three hundred thousand (300,000) gd from Lynnwood for the purpose of freeing up capacity for between six hundred twenty thousand (620,000) and nine hundred twenty thousand (920,000) gd for additional flows from Edmonds at the Lynnwood treatment plant; and

WHEREAS, Edmonds has provided enough transmission capacity for implementing the diversion when necessary; and

WHEREAS, Edmonds has the right to deliver six hundred twenty thousand (620,000) gd to the Lynnwood treatment plant; and

WHEREAS, Edmonds will not be required to participate in any further expansion of the Lynnwood treatment plant for capacity unless Edmonds' flows exceed nine hundred twenty thousand (920,000) gd;

NOW, THEREFORE, in consideration of the promises and the mutual covenants contained herein, the said parties hereby agree as follows:

Section 1. INCORPORATION OF PREVIOUS AGREEMENT. This agreement will serve as an amendment to the October 26, 1982 Agreement for Joint Use of Sanitary Sewerage Facilities Between City of Edmonds and City of Lynnwood which is incorporated by reference as if fully set forth herein.

Section 2. DEFINITION OF TERMS. For the purposes of the Agreement, the following are defined terms:

A. The term "diversion" shall mean the transmission of Lynnwood sewage flows to Edmonds beyond Lynnwood's allocated capacity at the Edmonds treatment plant for the purpose of vacating sufficient capacity in the Lynnwood treatment plant for Edmonds flows which exceed six hundred twenty thousand (620,000) gd.

Section 3. DELIVERY AND ACCEPTANCE OF ADDITIONAL SEWAGE. Presently, each City is reserving a capacity of three hundred thousand (300,000) gd, based on average annual daily flows, in its wastewater treatment plant for the other city. Each party agrees that, at a time when Edmonds reaches the limit of its allocated capacity at the Lynnwood plant of six hundred twenty thousand (620,000) gd, Lynnwood shall make additional capacity available for

Edmonds flows of up to three hundred thousand (300,000) additional gd, by diverting Lynnwood sewage to the Edmonds plant. The amount of sewage diverted shall be optional to each city, but shall not exceed three hundred thousand (300,000) gd without prior written consent and agreement. Lynnwood agrees to be responsible for monitoring the capacity of its plant, to inform Edmonds when diversion becomes necessary, and to make arrangements for said diversion. The Lynnwood capacity at the Edmonds treatment plant is two hundred (200) connections plus three hundred thousand (300,000) gd upon execution of this agreement.

Section 4. PAYMENT. The payment plant agreed to by each party in the October 26, 1982 agreement is still in effect, in all its facets, subject to the following: The capital costs of providing three hundred thousand (300,000) gd capacity at each plant shall not be charged to the other city.

Section 5. EFFECTIVE DATE. The provisions of this amendment shall become effective on the date this agreement is signed and the charges provided for herein commence on the effective date, unless other provisions have been made.

IN WITNESS WHEREOF, said parties have executed this agreement as of this 23rd day of October, 1989.

CITY OF EDMONDS

By: LARRY S. NAUGHTEN, Mayor

CITY OF LYNNWOOD

By: M. J. HRDLICKA, Mayor

ATTEST:

By: JACQUELINE G. PARRETT, City Clerk

By: ROBERT W. NOACK City Clerk

APPROVED AS TO FORM:

W. SCOTT SNYDER
City Attorney

EXHIBIT "B"

LEGAL DESCRIPTION OF JOINT SEWER AREAS FOR CITY OF EDMONDS

AREA E1A

Commencing at the southeast corner of Section 19, Township 27 North , Range 4 East W.M., situate in Snohomish County, State of Washington, this being on the centerlines of 76th AVENUE WEST and 212th STREET S.W.; thence northerly along said centerline to an intersection with a line extended from the north line of LOT 11, WILLOWDALE GARDENS DIVISION NO. 1; said point being the True Point of Beginning for AREAS E1 and L1; thence west to the northeast corner of said LOT 11; thence south to the southeast corner of said LOT 11; thence west to the southwest corner of said LOT 11; thence north along west lines of LOTS 11, 10, 9, 8, and 7 of WILLOWDALE GARDENS DIVISION NO. 1, to the northwest corner of said LOT 7; thence east along the north line of said LOT 7 to its midpoint; thence north across LOT 6, WILLOWDALE GARDENS DIVISION NO. 1 to the midpoint of the north line of said LOT 6; thence north to the midpoint of the south line of LOT 7, EDGEWOOD MANOR, L.E. NESS ADDITION; thence north to the midpoint of the north line of said LOT 7; thence west to the southeast corner of LOT 4, EDGEWOOD MANOR, DIVISION NO. 2; thence north along east lines of LOTS 4, 3, 2, and 1, said DIVISION NO. 2, to the northeast corner of said LOT 1; thence north along the west lines of LOTS 2 and 1 WILLOWDALE GARDENS DIVISION NO. 1, to the northwest corner of said LOT 1; thence east along north line of said LOT 1 to a point approximately 105 feet

west of the northeast corner of said LOT 1; thence north parallel to 76th AVENUE WEST to the south right-of-way boundary of 203rd STREET SOUTHWEST; thence northwesterly to the southeast corner of LOT 1, S-60-78; thence north to the northeast corner of said LOT 1; thence east to the southeast corner of LOT 2, S-60-78; thence north to the northeast corner of said LOT 2; thence east to the southwest corner of LOT 18, MEADOW PARK ADDITION; thence north to the northwest corner of LOT 1, MEADOW PARK ADDITION; thence northeasterly to the midpoint of the south line of BLOCK 10, CENTRAL PARK ADDITION; thence north to the midpoint of the north line of BLOCK 1, CENTRAL PARK ADDITION; thence northwesterly to the southwest corner of RT-18, SECTION 19; thence north to the northwest corner of said RT-18; thence west to the southwest corner of S-14-79; thence west to the northwest corner of RT-1G-1, SECTION 19; thence south to the southeast corner of RT-1G, SECTION 19; thence west to the southwest corner of said RT-1G; thence north to the southeast corner of RT-1N, SECTION 19; thence west along the south lines of RT-1N, SECTION 19, RT-1H1, SECTION 19; thence continuing west along said line to an intersection with the east line of RT-1E-1, SECTION 19; thence south to the southeast corner of said RT-1E-1; thence west to the southwest corner of RT-1E-2, SECTION 19; thence along a line continued from said corner to an intersection with the east right-of-way boundary of 80th AVENUE WEST; thence south to an intersection with a line extended from the south line of LOT 8, MAPLEWOOD GROVE; thence west along south lines of LOTS 8 and 11, MAPLEWOOD

GROVE to the southwest corner of said LOT 11; thence west to the northwest corner of LOT 1, VALLEY HI; thence south to the southwest corner of said LOT 1; thence west to the southwest corner of LOT 18, VALLEY HI; thence north along the west lines of LOTS 18 through 10, VALLEY HI, to the northwest corner of said LOT 10; thence west to the southeast corner of LOT 8, TAMIWOOD; thence north along the east line of LOTS 8 through 4, TAMIWOOD, to the northeast corner of said LOT 4; thence west to the northwest corner of said LOT 4; thence northerly to the northeast corner of LOT 27, TAMIWOOD; thence west to the northwest corner of said LOT 27; thence north to the southeast corner of LOT 4, ROBERT E. THOMAS ADDITION; thence west to the southwest corner of LOT 2, said ADDITION; thence north to the northwest corner of said LOT 2; thence continuing north to an intersection with the north line of the northeast 1/4 of SECTION 19, this being on the centerline of 196th STREET SOUTHWEST, at a distance of 102.5 feet more or less east of the southwest corner of the southeast 1/4 of SECTION 18, Township 27 North, Range 4 East W.M., situate in Snohomish County, Washington; thence continuing north to the north right-of-way boundary of 196th STREET SOUTHWEST; thence west along last said boundary to the southwest courner of RT-27, SECTION 18; thence north to the northwest corner of said RT-27; thence west to the southwest corner of RT-27C-2, SECTION 18; thence north to the northwest corner of RT-27C-1, SECTION 18; thence east to the midpoint of the south line of RT-27B, SECTION 18; thence north, parallel to 84th AVENUE WEST to the midpoint of the north line of LOT 34, MAPLEWOOD

GARDENS, UNRECORDED; thence west along said north line to an intersection with a line 174 feet from, and parallel to the west right-of-way boundary of 84th AVENUE WEST; thence north along said parallel line to an intersection with the south line of SEAVIEW ESTATES, NO. 2; thence east to the southwest corner of LOT 6, SEAVIEW ESTATES NO. 2; thence north to the northwest corner of LOT 1, SEAVIEW ESTATES NO. 2; thence east along the north line of said LOT 1, a distance of 6 feet more or less; thence north, parallel to 84th AVENUE WEST, to an intersection with the south line of TRACT 20, EDMONDS SEAVIEW TRACTS; thence west along said south line, a distance of 48.6 feet more or less; thence north, parallel to 84th AVENUE WEST, to an intersection with a line 133 feet more or less south of, and parallel to, the south right-of-way boundary of 188th STREET SOUTHWEST; thence east along said parallel line, a distance of 60 feet more or less; thence north, parallel to 84th AVENUE WEST, to an intersection with the north right-of-way boundary of 188th STREET SOUTHWEST; thence east along said boundary, to the southwest corner of LOT 22, SEAVIEW FOREST TRACTS; thence north along the west lines of LOTS 22, 21, 8, and 7 of said TRACTS, and along the west line of LOT 3, SEAVIEW FOREST TRACTS, DIVISION NO. 3, to the northwest corner of said LOT 3; thence east to the northeast corner of said LOT 3; thence north to the northwest corner of LOT 6 of said TRACTS DIVISION NO. 3; thence east to the northeast corner of said LOT 6; thence east to the southwest corner of RT-13A-4, SECTION 18; thence north to the northwest corner of said RT-13A-4; thence continue to an intersection

with the north right-of-way boundary of 184th STREET SOUTHWEST; thence east along said boundary to an intersection with the west line of RT-5E, SECTION 18; thence north along said west line, a distance of 150 feet more or less; thence east to the northwest corner of LOT 17, BLOCK 18, FIRST ADDITION TO CITY OF EDMONDS; thence east to the northeast corner of said LOT 17; thence north parallel to ANDOVER STREET, to an intersection with the south line of LOT 11, SEAVIEW VILLAGE; thence east along said south line and along the south line of LOT 10, SEAVIEW VILLAGE, to an intersection with the west right-of-way boundary of 81st AVENUE WEST; thence north along said boundary to an intersection with the north right-of-way boundary of 183rd STREET SOUTHWEST; thence east to an intersection with the east line of SEAVIEW VILLAGE; thence northerly along said east line to the northwest corner of LOT 4, DYER'S HOMES; thence east to the southwest corner of LOT 4, SEAVIEW FIRS; thence north to the northwest corner of LOT 3, SEAVIEW FIRS; thence east along the north line of SEAVIEW FIRS, to an intersection with the west right-of-way boundary of 80th AVENUE WEST; thence north along last said boundary to an intersection with the north right-of-way boundary of 180th STREET SOUTHWEST; thence east along last said boundary continued to an intersection with the east right-of-way boundary of OLYMPIC VIEW DRIVE; thence southeasterly along last said boundary to an intersection with the north line of LOT 1, BLOCK 2, ADMIRALTY ACRES; thence east along said north line to an intersection with the west right-of-way boundary of 76th AVENUE WEST; thence

northerly along last said boundary to an intersection with the south line of RT-30, SECTION 7, said point being on the north line of Snohomish County Park; thence west along said north line to the southwest corner of LOT 53, TALBOT PARK; thence south to the southeast corner of LOT 43, TALBOT PARK; said corner being also the northeast corner of LOT 5, TALBOT SEAVIEW ADDITION, SECTION 18, thence south along the east line of said LOT 5, to an intersection with the northerly right-of-way boundary of OLYMPIC VIEW DRIVE; thence southwesterly along last said boundary to an intersection with the extended southerly line of LOT 22, PLAT OF MAPLE MANOR, UNRECORDED; thence northwesterly along said southerly line to the southwest corner of said LOT 22; thence northeasterly along the east boundary to the Great Northern Railway right-of-way to an intersection with the south line of that Government Lot marked "J.C. LUND'S RESERVE", said intersection being 58 feet more or less north of, and 60 feet more or less west of the northwest corner of TRACT 13, LUND'S MEADOWDALE TRACTS, and said intersection being also on the northerly boundary of the City of Edmonds, Washington, as described in City of Edmonds Ordinance No. 1004, dated August 1, 1963; thence easterly along said northerly boundary of the City of Edmonds, being also the northerly right-of-way boundary of LUND'S GULCH ROAD (not open), and being also the southerly lines of that Government Lot marked "J.C. LUND'S RESERVE" and of TRACTS 51 and 52, LUND'S MEADOWDALE TRACTS, to an intersection with the east right-of-way boundary of 68th AVENUE WEST (vacated), at a distance of 390 feet more or

less north of the southwest corner of TRACT 13, PLAT OF MEADOWDALE BEACH; thence southerly along the said east right-of-way boundary of 68th AVENUE WEST to an intersection with the south right-of-way boundary of NORTH MEADOWDALE ROAD; thence northwesterly along said boundary to an intersection with a line 270 feet more or less south of, and parallel to, the north line of SECTION 8, Township 27 North, Range 4 East, W.M.; thence west along said parallel line to an intersection with the west line of TRACT 83, PLAT OF MEADOWDALE BEACH; thence south to the southwest corner of said TRACT 83; thence west to northwest corner of TRACT 106 of said plat; thence south to the southwest corner of TRACT 117 of said plat; thence east to the southeast corner of TRACT 114 of said plat; thence continue to an intersection with the west right-of-way boundary of OLYMPIC VIEW DRIVE; thence southwesterly along last said boundary to the southeast corner of TRACT 154, PLAT OF MEADOWDALE BEACH; thence west to the southwest corner of TRACT 155 of said plat; thence southwesterly along the easterly right-of-way boundary of 72nd AVENUE WEST, to an intersection with the north right-of-way boundary of 180th STREET SOUTHWEST; thence southeasterly to the northwest corner of RT-10A, SECTION 17; thence south along west line of said RT-10A to an intersection with the extended south line of LOT 1, PLAT OF HOMEVIEW ADDITION NO. 1, SECTION 17, Township 27 North, Range 4 East, W.M.; thence west to the northwest corner of LOT 78, PLAT OF HOMEVIEW ADDITION NO. 2; thence southerly along the west line of said LOT 78, to an intersection with the extended south line of LOT 8 of last-named plat; thence

westerly along said south line to the southwest corner of LOT 1, HOMEVIEW ADDITION NO. 2; thence continue along said line to an intersection with the east right-of-way boundary of 76th AVENUE WEST; thence southerly along said boundary of 76th AVENUE WEST to an intersection with the south right-of-way boundary of OLYMPIC VIEW DRIVE; thence west to the centerline of 76th AVENUE WEST; thence southerly along said centerline to an intersection with the extended north line of LOT 14, BLOCK 1, PARK ADDITION; thence west to the northwest corner of LOT 8, BLOCK 1, PARK ADDITION; thence south to the southwest corner of said LOT 8; thence continue to an intersection with the south line of SECTION 18, Township 27 North, Range 4 East, W.M., this being on the centerline of 196th STREET SOUTHWEST; thence southwesterly to the northeast corner of RT-2B, SECTION 19, Township 27 North, Range 4 East, W.M.; thence south to the southeast corner of said RT-2B; thence east to the northeast corner of LOT 14, SANDALWOOD NO. 2; thence south along east lines of LOTS 14, 15, and 16, SANDALWOOD NO. 2, to the southeast corner of said LOT 16; thence continue to an intersection with the south right-of-way boundary of 199th STREET SOUTHWEST; thence east along said boundary to the northeast corner of S-14-79; thence continue east to the centerline of 76th AVENUE WEST; thence southerly along said centerline of 76th AVENUE WEST to the True Point of Beginning for AREAS E1 and L1 EXCEPT that portion of the Lynnwood Treatment Plant area within AREA L1B, and EXCEPT that portion hereinafter designated as AREA E1B.

AREA E1B

TRACTS 71, 72 and 84, PLAT OF MEADOWDALE BEACH, minus east 10 feet of said TRACTS, together with that right-of-way lying south of TRACT 72, and North of TRACT 84 and extending from West boundaries of said TRACTS, to the East boundaries thereof, all in Sections 5 and 8, Township 27 North, Range 4 East, W.M.; said area containing 12.6 acres.

AREA E1C

That portion of developed area of the pier commonly known as the Laebugten Wharf, lying within TRACTS 2 through 11, PLAT OF MEADOWDALE TIDELANDS, Sections 5 and 6, Township 27 North, Range 4 East, W.M., situate in Snohomish County, Washington; said area containing 2.0 Acres, more or less.

EXHIBIT "B"

LEGAL DESCRIPTION OF JOINT SEWER AREA FOR CITY OF LYNNWOOD

AREA L1A

Beginning at the southwest corner SECTION 20, Township 27 North, Range 4 East, W.M., Snohomish County, State of Washington, said corner being on the centerlines of 76th AVENUE WEST AND 212th STREET SOUTHWEST; thence northerly along the centerline of 76th AVENUE WEST to its intersection with the centerline of 208th STREET SOUTHWEST, said point being the True Point of Beginning of AREA "L1"; thence east along said centerline to its intersection with the extended west line of LOT 9, PLAT OF AURORA HEIGHTS; thence south along said extended west line to the southwest corner of said LOT 9; thence east to the southeast corner of said LOT 9; thence south along the west line of LOT 5, BLOCK 1, SEATTLE HEIGHTS DIVISION NO. 4, to the southwest corner of said LOT 5; thence east along the extended south line of LOTS 5, 4, and 3, of said PLAT to its intersection with a line 20 feet from and parallel to the east right-of-way boundary of 70th AVENUE WEST; thence north along said parallel line, 235.68 feet more or less to its intersection with the extended south line of LOT 12, HOYT ACRES; thence east along said extended south line 223.23 feet; thence south to the southwest corner of LOT 7, HOYT ACRES; thence east along the extended south line of said LOT 7 to its intersection with the centerline of SR-99; thence southwesterly along the centerline of SR-99 to the extended line that bears S67°03'E from a point on the east right-of-way boundary of SR-99, said point being 359.25

feet south of the north line of LOT 31, SOLNER'S FIVE ACRE TRACTS, measured along the east right-of-way boundary of SR-99; thence southeasterly to the north right-of-way boundary of the PACIFIC NORTHWEST TRACTION COMPANY right-of-way; thence northeasterly along said boundary to its intersection with the northerly right-of-way boundary of 212th STREET SOUTHWEST; thence easterly along last said boundary to its intersection with the east line of the PLAT OF MIRIAM PARK; thence north along said east line to its intersection with the north line of said PLAT; thence west along said north line continued to its intersection with the southernmost point on ASSESSOR'S LOT NO. 4-038, SECTION 21, said point being on the northwesterly right-of-way boundary of INTERSTATE 5; thence northeasterly along said boundary to its intersection with the southeast boundary of PACIFIC NORTHWEST TRACTION COMPANY right-of-way; thence northeasterly along last said boundary to its intersection with the east right-of-way boundary of 44th AVENUE WEST; thence continuing northeasterly along the southeast boundary of the PACIFIC NORTHWEST TRACTION COMPANY right-of-way to the extended south right-of-way boundary of 196th STREET SOUTHWEST; thence west along said boundary to its intersection with the northwesterly boundary of PACIFIC NORTHWEST TRACTION COMPANY right-of-way; thence northeasterly along last said boundary to its intersection with the extended northeasterly line of TRACT 18, BLOCK 2, ALDERWOOD MANOR; thence southeasterly along last said extended line of TRACT 18 to its intersection with the southeasterly boundary of PUGET SOUND POWER AND LIGHT COMPANY right-of-way; thence northeasterly along last

said boundary to a point of intersection with an extension of the east line of LOT 14, BLOCK 4, ALDERWOOD MANOR NO. 3; thence north along said east line to its intersection with the northwesterly right-of-way boundary of BEECH ROAD; thence northeasterly along last said boundary to its intersection with the south line of LOT 5, BLOCK 4, ALDERWOOD MANOR NO. 3; thence west along said south line to the southeast corner of LOT 3, said BLOCK 4; thence north along the east line of LOT 3 approximately 460 feet more or less; thence west parallel to 182nd STREET SOUTHWEST to an intersection with the east line of SECTION 15, Township 27 North, Range 4 East, W.M.; thence north along said east line to the northeast corner of said SECTION 15; thence west along the north line of said SECTION 15, to an intersection with the westerly right-of-way boundary of 36th AVENUE WEST; thence north along last said boundary to its intersection with the southerly right-of-way boundary of 164th STREET SOUTHWEST; thence westerly along last said boundary to its intersection with the easterly right-of-way boundary of SR-99; thence northwesterly to the southeast corner of LOT 6, BLOCK 1, ALDERWOOD MANOR NO. 4, said point being on the westerly boundary of SR-99; thence northerly along the east lines of LOTS 6, 7, and 8, BLOCK 1, ALDERWOOD MANOR NO. 4, to the northeast corner of said Lot 8; thence northwesterly to the northeast corner of the northwest 1/4, SECTION 5, Township 27 North, Range 4 East, W.M.; thence west along the north line of said SECTION 5 to its intersection with the easterly right-of-way boundary of GREAT NORTHERN R.Y.; thence southerly along last said boundary to its intersection with the south line of that Government Lot

marked "J.C. LUND'S RESERVE", said intersection being 58 feet more or less north of, and 60 feet more or less west of the northwest corner of TRACT 13, LUND'S MEADOWDALE TRACTS, and said intersection being also on the northerly boundary of the City of Edmonds, Washington, as described in City of Edmonds' Ordinance No. 1004, dated August 1, 1963; thence easterly along said northerly boundary of the City of Edmonds, being also the northerly right-of-way boundary of LUND'S GULCH ROAD (not open), and being also the southerly lines of that Government Lot marked "J.C. LUND'S RESERVE" and of TRACTS 51 and 52, LUND'S MEADOWDALE TRACTS, to an intersection with the east right-of-way boundary of 68th AVENUE WEST (vacated), at a distance of 390 feet more or less, north of the southwest corner of TRACT 13, PLAT OF MEADOWDALE BEACH; thence southerly along the said east right-of-way boundary of 68th AVENUE WEST to an intersection with the south right-of-way boundary of NORTH MEADOWDALE ROAD; thence northwesterly along said boundary to an intersection with a line approximately 270 feet more or less from, and parallel to, the north line of SECTION 8, Township 27 North, Range 4 East, W.M.; thence west along said parallel line to an intersection with the west line of TRACT 83, PLAT OF MEADOWDALE BEACH; thence south to the southwest corner of said TRACT 83; thence west to the northwest corner of TRACT 106 of said PLAT; thence south to the southwest corner of TRACT 117 of said PLAT; thence east to the southeast corner of TRACT 114 of said PLAT; thence continue to an intersection with the west right-of-way boundary of OLYMPIC VIEW DRIVE; thence southwesterly along said west boundary to the southeast corner of TRACT 154, PLAT

OF MEADOWDALE BEACH; thence west to the southwest corner of TRACT 155 of said PLAT; thence southwesterly along the east right-of-way boundary of 72nd AVENUE WEST, to an intersection with the north right-of-way boundary of 180th STREET SOUTHWEST; thence east to an intersection with the east right-of-way boundary of 72nd AVENUE WEST extended from south of 180th STREET SOUTHWEST; thence south along said boundary to an intersection with a line extended from the south line of LOT 1, PLAT OF HOMEVIEW ADDITION NO. 1, SECTION 17, Township 27 North, Range 4 East, W.M.; thence west to the northwest corner of LOT 78, PLAT OF HOMEVIEW ADDITION NO. 2; thence south along the west line of said LOT 78, to an intersection with a line extended from the south line of LOT 8 of last named PLAT; thence west along said south line to the southwest corner of LOT 1, HOMEVIEW ADDITION NO. 2, said SECTION 17; thence continue said line to an intersection with the east right-of-way boundary of 76th AVENUE WEST; said intersection lying in SECTION 18, Township 27 North, Range 4 East, W.M.; thence southerly along east right-of-way boundary of 76th AVENUE WEST, to an intersection with the south right-of-way boundary of OLYMPIC VIEW DRIVE; thence west to the centerline of 76th AVENUE WEST; thence southerly along said centerline to an intersection with extended north line of LOT 14, BLOCK 1, PARK ADDITION; thence west to the northwest corner of LOT 8, BLOCK 1, PARK ADDITION; thence south to the southwest corner of said LOT 8; thence continue to an intersection with the south line of SECTION 18, Township 27 North, Range 4 East, W.M., this being on the

centerline of 196th STREET SOUTHWEST; thence southwesterly to the northeast corner of RT-2B, SECTION 19, Township 27 North, Range 4 East, W.M.; thence south to the southeast corner of said RT-2B; thence east to the northeast corner of LOT 14, SANDALWOOD NO. 2; thence south along east lines of LOTS 14, 15, and 16, SANDALWOOD NO. 2, to the southeast corner of said LOT 16; thence continue to an intersection with the south right-of-way boundary line of 199th STREET SOUTHWEST; thence east along said boundary to the northeast corner of S-14-79; thence continue east to the centerline of 76th AVENUE WEST; thence southerly along said centerline of 76th AVENUE WEST to the True Point of Beginning for AREA "L1"; EXCEPT that portion hereinafter designated as AREA "L2".

AREA L1B (Include)

Commencing at the East quarter corner of SECTION 7, Township 27 North, Range 4 East, W.M., and proceeding thence along the centerline of 76th AVENUE WEST (also known as MEADOWDALE ROAD) North 1°11'45" East 602.27 feet to the True Point of Beginning; thence North 61°33'10" West 22.50 feet to the point of intersection of the westerly line of 76th AVENUE WEST and the southwesterly line of BROWN'S POINT ROAD (also known as BERTOLA ROAD) as recorded under Auditor's file No. 733197; thence northwesterly, northerly and northeasterly along the southwesterly, westerly and northwesterly line of said BROWN'S POINT ROAD, with the following courses, curves and distances:

North 61°33'10" West 198.53 feet, on a curve to the right having a radius of 120.00 feet a distance of 80.69 feet; North 23°01'30" West 141.15 feet; North 9°21'30" West 76.47 feet, on a curve to the right having a radius of 170.00 feet a distance of 67.93 feet; North 13°32'10" East 4.07 feet; thence N 89°03'05" West 146.80 feet; thence N30°00'W, 139.92 feet; thence N89°03'05"W, 476.72 feet to the Government meander line; thence southwesterly along said Government meander line to the south corner of LOT 2, EDMONDS TIDE LANDS; thence northerly along west line of said LOT 2, to a point on the south line of LOT 43, PLAT OF MEADOWDALE TIDE LANDS; thence along said south line to the westerly line of said LOT 43; thence northerly along the westerly line of LOT 43 and LOT 42 of said PLAT to the north line of said LOT 42;

thence easterly along said North line and the easterly projection thereof, to an intersection with the Easterly right-of-way line of the GREAT NORTHERN RAILWAY; thence southwesterly along said right-of-way line to the north line of GOVERNMENT LOT 2, SECTION 7, Township 27 North, Range 4 East, W.M.; thence S89°03'05"E, along said north line to a point which is S89°03'05"E, 538.90 feet from said Government meander line; thence S38°05'41"E, 193.14 feet; thence N89°03'05"W, 29.65 feet to a point on the easterly line of the aforementioned BROWN'S POINT ROAD; thence southwesterly, southerly and southeasterly along the southeasterly, easterly, and northeasterly line of said BROWN'S POINT ROAD and the projection thereof to its intersection with the centerline of 76th AVENUE WEST; thence S1°11'45"W, 45.0 feet to the True Point of Beginning.

AREA L2

TRACTS 106, 116, and 117, PLAT OF MEADOWDALE BEACH, all in SECTION 8, Township 27 North, Range 4 East, W.M., Snohomish County, Washington; said area containing 31.4 acres more or less, all as shown on EXHIBIT "A", attached hereto.

AREA L3

Beginning at the Northeast corner of the Southeast 1/4, Southwest 1/4, SECTION 20, Township 27 North, Range 4 East, W.M.,; Snohomish County, State of Washington; thence West 672.13 feet more or less; thence North 30 feet to the True Point of Beginning; thence West 455.23 feet more or less to

its intersection with the extended West line of LOT 9, PLAT OF AURORA HEIGHTS; thence South 70 feet to the Northwest corner of LOT 9, PLAT OF AURORA HEIGHTS; thence continue the same course 292.26 feet to the Southwest corner of LOT 9, PLAT OF AURORA HEIGHTS; thence East 104.02 feet along the South line of LOT 9 of said PLAT OF AURORA HEIGHTS; thence South 302.04 feet along the West line of LOT 5, BLOCK 1, SEATTLE HEIGHTS DIVISION NO. 4; thence East 352.9 feet along the extended South line of LOTS 3, 4, and 5, PLAT OF SEATTLE HEIGHTS DIVISION NO. 4; thence North 267.47 feet; thence East 356.98 feet; thence North 150.03 feet more or less; thence West 357.13 feet; thence North 252.50 feet to the True Point of Beginning.

TOGETHER with LOTS 7 through 12 inclusive, HOYT ACRES, less the North 30.0 feet of LOT 12 as measured at right angles to the North line of said LOT 12; plus that portion of the East half of the Southeast Quarter of the Southwest corner of SECTION 20, Township 27 North, Range 4 East, W.M.; beginning at the Southwest corner of LOT 7, HOYT ACRES: thence North 361.46 feet to a point on the South line of LOT 12, said HOYT ACRES projected West; thence East along said extended South line of LOT 12, 181.23 feet to the Southwest corner of said LOT 12; thence along the Westerly boundary of LOTS 7 through 11, said HOYT ACRES, 399.16 feet to the Point of Beginning; plus that portion of the East half of the Southwest Quarter of the Southwest Quarter of SECTION 20, Township 27 North, Range 4 East, W.M.,; beginning at the Northwest corner of

LOT 12, HOYT ACRES; thence along the West line of LOT 12 for a distance of 33.14 feet, to a point that is 30.0 feet South of the North line of LOT 12, as measured at right angles; thence West for a distance of 60.0 feet; thence Southwest for a distance of 19.14 feet; thence West for a distance of 366.98 feet more or less to the center of 70TH AVENUE WEST; thence South along said centerline for a distance of 25.0 feet; thence East for a distance of 414.44 feet more or less to the Southwest corner of LOT 12, HOYT ACRES; thence Northeast for a distance of 46.76 feet more or less to the True Point of Beginning. EXCEPT the Westerly portion deeded for road purposes for 70TH AVENUE WEST.

EXHIBIT "C"

DESCRIPTIONS OF JOINT SEWERAGE SYSTEMS

PART 1

The term "joint sewerage system Part 1" shall mean the presently existing facilities owned and operated by Lynnwood consisting of a sewage treatment facility and truck sewers being located as follows:

UNIT 1: Beginning at the intersection of 208th ST. S.W. with 76th AVE. W. and thence northerly in and along 76TH AVE. W. to the LYNNWOOD sewage treatment plant, UNIT 9A.

UNIT 2A: Beginning at the intersection of OLYMPIC VIEW DRIVE with 76TH AVE. W., thence east and northeasterly in and along OLYMPIC VIEW DRIVE TO 180TH ST. S.W.; thence easterly in and along 180TH ST. S.W. a distance of 200' more or less; thence northerly in and along an easement and parallel with 68TH AVE. W. to 176th ST. S.W.; thence northeasterly parallel with OLYMPIC VIEW DRIVE to an intersection with 173RD ST. S.W.

UNIT 2B: Beginning at the north end of UNIT 2A; thence northwesterly to OLYMPIC VIEW DRIVE; thence northeasterly in and along OLYMPIC VIEW DRIVE to its intersection with 168TH ST. S.W.

UNIT 2C: Beginning at the north end of UNIT 2B; thence west along 168TH ST. S.W. to an intersection with 63RD AVE. W.;

thence north along 63RD AVE. W. and easement to an intersection with an easement along the south line of WREN GLEN NO. 2, Section 8, Township 27 North, Range 4 east W.M.; thence west along last said easement to an intersection with 64TH AVE. W.; thence north to an intersection with 165TH PL. S.W.; thence west in and along 165TH PL. S.W. and easement to an intersection with 66TH AVE. W.; thence south to an intersection with NORTH MEADOWDALE ROAD; thence westerly in and along said road to an intersection with 68TH AVE W.; thence north in and along 68TH AVE. W. to an intersection with 164TH ST. S.W.;

TOGETHER with the sewage treatment plant constructed as UNIT 9A; and the outfall sewer constructed as UNIT 9B, all as shown on EXHIBIT "A", attached hereto; and

TOGETHER with such replacement, additions or betterments thereto which may be constructed in the future for the joint benefits of the parties hereto.

PART 2

The term "joint sewerage system Part 2" shall mean the presently existing facilities owned and operated by Edmonds consisting of a system of 8" trunk sewers being located as follows:

UNIT 3: Beginning at the intersection of MEADOWDALE BEACH ROAD with 72ND AVE. W.; thence northwesterly and westerly in

and along MEADOWDALE BEACH ROAD to 76TH AVE. W.; thence south in and along 76TH AVE. W. a distance of 157' more or less; thence northwesterly 100' more or less; thence southwesterly 148' more or less; thence westerly to a point of connection with existing LYNNWOOD 24" sewer on approximate centerline of BERTOLA ROAD; said section containing approximately 2,380 lineal feet of sewer line; all as shown on EXHIBIT "A", attached hereto; and

TOGETHER with such replacements, additions or betterments thereto which may be constructed in the future for the joint benefits of the parties hereto.

PART 3

The term "joint sewerage system Part 3" shall mean the presently existing facilities owned, operated and maintained as set forth below and consisting of:

UNIT 4: 1,248 lineal feet of 8" sewer constructed in 1967 pursuant to ESR-218 and ESR-269 plus 775 lineal feet of 8" sewer constructed in 1964 pursuant to ESR-221; both presently owned, operated and maintained by Edmonds, and located as follows:

Beginning at a point 115' more of less south of the intersection of 210TH S.W. and 70TH AVE. W.; thence south 543' more or less in and along 70TH AVE. W. to an intersection with 212TH ST. S.W.; thence west 705' more or less in and along 212TH ST. S.W. to an intersection with 72ND

AVE W.; from said intersection, stub north 35' more or less; also from said intersection, bearing south in and along 72ND AVE. W., 705' more or less to a connection with UNIT 5.

UNIT 5: 785 lineal feet of 8" sewer, 1,440 lineal feet of 4" force main, 1,462 lineal feet of 10" sewer and 130 lineal feet of 12" sewer, together with a pump station, all constructed in 1964 pursuant to LID-119 and presently owned, operated and maintained by Edmonds and located as follows:

Continuing from UNIT 4 connection, south 600' more or less in and along 72ND AVE. W. to an intersectsion with 216TH ST. S.W.; thence east 185' more or less in and along 216TH ST. S.W. to the pump station situated west of U.S. HIGHWAY 99; thence southwesterly by force main in and along U.S. HIGHWAY 99, a distance of 1,440' more or less to an intersection with 220TH ST. S.W.; thence southwesterly 1,462 more or less in and along U.S. HIGHWAY 99 to an intersection with 224TH ST. S.W.; thence east in and along 224TH ST. S.W. 130' more or less to a connection with UNIT 6.

UNIT 5A: 1,440 lineal feet of 8" force main constructed in 1979 to increase capacity to meet present and future needs and presently owned, operated and maintained by Edmonds and located as follows:

Continuing from UNIT 5 pump station at 216TH ST. S.W.; thence southwesterly in and along U.S. HIGHWAY 99 to 220TH ST. S.W. connection with UNIT 5.

UNIT 6: 3,921 lineal feet of 12" sewer and 38 lineal feet of 15" sewer, all constructed in 1963 pursuant to LID-108 and presently owned, operated and maintained by Edmonds and located as follows:

Continuing from UNIT 5 connection in 224TH ST. S.W.; thence east 454' more or less in and along 224TH ST. S.W. to an intersection with 73RD AVE. W.; thence south 664' more or less in and along 73RD AVE. W. to an intersection with an easement along the north line of LAKE BALLINGER HOMES NO. 2, Section 29, township 27 north, Range 4 east W.M.; thence east 394' more or less in and along said easement to an intersection with the PACIFIC NORTHWEST TRACTION CO. right-of-way; thence southerly in and along said right-of-way, 906' more or less to an intersection with an easement 200' more or less south of 228TH ST. S.W.; thence southwesterly 162' more or less in and along last said easement to the intersection of 229TH ST. S.W. and 74TH AVE. W.; thence southerly 412' more or less in and along 74TH AVE. W. to 230TH ST. S.W.; thence southeasterly 194' more or less in and along an easement to an intersection with the PACIFIC NORTHWEST TRACTION CO. right-of-way; thence southerly in and along said right of way 735' more or less to an intersection with 75TH PL. W.; thence southeasterly 38' more or less, crossing said TRACTION CO. right-of-way to a connection with UNIT 7A.

UNIT 7A: 3,840 lineal feet of 24" diameter trunk sewer (Ballinger Trunk) constructed jointly by Edmonds and Mountlake Terrace in 1962 pursuant to the joint use agreement

dated September 15, 1961, and presently owned, operated and maintained by Edmonds.

UNIT 8: The existing sewage lift station constructed by Mountlake Terrace at the southerly end of Lake Ballinger in 1959, and presently owned, operated and maintained by Mountlake Terrace.

UNIT 9: 3,246 lineal feet of 18" diameter pressure pipeline constructed by Mountlake Terrace in 1959 along 244th St. S.W. from the said lift station (UNIT 8) to its point of discharge into a gravity trunk sewer (UNIT 10) at U.S. HIGHWAY 99, and presently owned, operated and maintained by Mountlake Terrace.

UNIT 10: The existing gravity trunk sewer constructed by Mountlake Terrace in 1959 along EDMONDS WAY from U.S. HIGHWAY 99 to 98TH AVE W. in Edmonds, the most southerly 1,115 lineal feet thereof being 30" diameter pipe and the remainder being of 24" diameter pipe, transferred to jurisdiction, operation and maintenance by Edmonds pursuant to the Joint Use Agreement dated October 5, 1971.

UNIT 11: The existing 24" and 30" gravity trunk sewer constructed by Edmonds in 1959 from the end of UNIT 10 at 98TH AVE. W. along EDMONDS WAY and FIFTH AVE. in the City of Edmonds to ELM ST., thence westerly on ELM ST. and northerly to existing treatment plant of the City of Edmonds at SECOND

AVE. and DAYTON ST., and presently owned and operated and maintained by Edmonds.

UNIT 12: The original sewage treatment plant at SECOND AVE. and DAYTON ST. in Edmonds, as it existed on February 28, 1959, and presently owned, operated and maintained by Edmonds.

UNIT 12A: The existing 36" diameter sewer outfall extending a distance of approximately 1,800 lineal feet from the Edmonds sewage treatment plant into deep salt water, and constructed by Edmonds in 1959, and presently owned, operated and maintained by Edmonds.

UNIT 12B: The modifications and additions to the original Edmonds sewage treatment plant (UNIT 12) as constructed by Edmonds in 1959 to expand the original plant capacity for service to Mountlake Terrace under the Joint Use Agreement of February 28, 1959, and presently owned, operated and maintained by Edmonds.

UNIT 12C: The modifications and additions to the Edmonds sewage treatment plant as constructed by Edmonds in 1967 for conversion from sludge digestion to a sludge thickening and incineration process for sewage sludge disposal, and presently owned, operated and maintained by Edmonds.

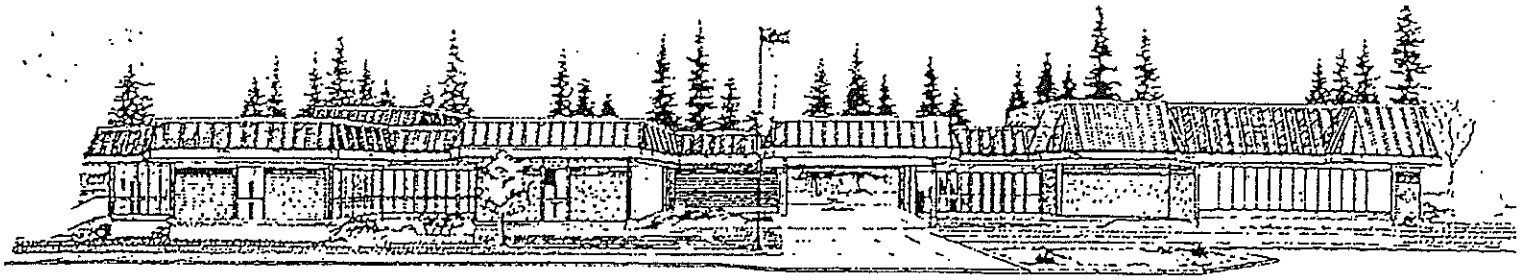
UNIT 12D: The additions to the Edmonds sewage treatment

plant as constructed by Edmonds in 1971 to increase plant capacity to meet present and future needs, and presently owned, operated and maintained by Edmonds.

UNIT 12E: The extension and modification of the existing 36" diameter sewer outfall as constructed by Edmonds in 1971, in compliance with changes in requirements by State agencies, and presently owned, operated and maintained by Edmonds, and ALL as shown on EXHIBIT "B", attached hereto;

TOGETHER with such replacements, additions or betterments thereto which may be constructed in the future for the joint benefits of the parties hereto.

G.5 Agreement between City of Edmonds and City of Lynnwood – November 19, 1987



CITY OF LYNNWOOD

PUBLIC WORKS DEPARTMENT

19100 44TH AVENUE WEST
LYNNWOOD, WASHINGTON 98036
PHONE 775-1971

November 19, 1987

RECEIVED
NOV 24 1987
ENGINEERING

Bob Alberts, City Engineer
City of Edmonds
250 5th Avenue N.
Edmonds, WA 98020

RE: PARTICIPATION IN LYNNWOOD SECONDARY TREATMENT PLANT EXPANSION

Dear Bob:

Following your request of Loren last Thursday, enclosed is a copy of the City of Lynnwood's Sewerage System Engineering Report for Secondary Treatment dated March 1987, which describes the various treatment alternatives and the proposed process which has subsequently been approved by Washington State DOE for construction at the Lynnwood plant site.

You specifically questioned Edmonds' participation for a portion of our plant capacity to be reserved for flow from your area. According to the report, 0.62 mgd is being set aside for flows from the Edmonds system, exclusive of the 300,000 gpd exchange capacity described in my letter of September 15, 1987. Page 4-2 describes the service area sewage flows that will require a total plant capacity of 5.4 mgd (annual average daily flow) in the year 2010. Your share of the cost would be 11.5%, the proportional amount equal to 0.62/5.40.

The estimated project cost for the facility is $18,210,000. The City expects a 50% grant which would reduce the capital liability to $9,105,000. Applying your pro-rated share of 11.5%, your cost would be $1,047,075. A description of the various elements included in the total project cost are shown on page 6-5, table 6-1.

Your share of the operation maintenance cost would also be based on a proportional amount of your capacity of the plant. The estimated O & M cost for the key years 1992, 2000 and 2010 are shown on page 6-7, table 6-2.

Including the exchange capacity with this and other agreements will result in a total Edmonds flow into Lynnwood STP of 920,000 gpd (620,000 + 300,000) and a total Lynnwood flow into Edmonds of 480,000 gpd (200 equiv. units @ 900 gpu + 300,000). Participation in plant improvements and operation for either city will not reflect the reserve capacity provided by the exchange.

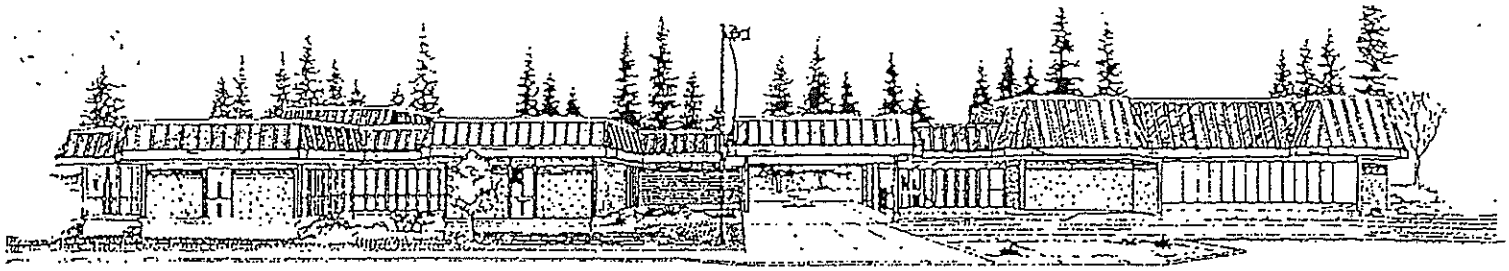
As we progress through the design phase of the plant and firm the financing of the project, you will be further advised of changes to your anticipated costs.

Very truly yours,

CITY OF LYNNWOOD

W. E. NIMS, P.E.
Director of Public Works

WEN/smw
171E1
Encl.



CITY OF LYNNWOOD

PUBLIC WORKS DEPARTMENT

19100 44TH AVENUE WEST
LYNNWOOD, WASHINGTON 98036
PHONE 775-1971

September 15, 1987

File Edmonds Agreement

Peter E. Hahn, Director
Community Services
City of Edmonds
205 5th Avenue N.
Edmonds, WA 98020

RE: TREATMENT PLANT CAPACITY

Dear Mr. Hahn:

This letter confirms our discussions where Lynnwood agrees to trade treatment plant capacity of 300,000 gallons per day between our Lynnwood plant for Edmonds and your Edmonds plant for Lynnwood. This additional 300,000 gallons per day will be above that capacity agreed to prior to August 12, 1987.

This trade of 300,000 GPD additional capacity is to be made at no exchange of funds. Lynnwood will not bill Edmonds for this capacity and vice versa.

Very truly yours,

CITY OF LYNNWOOD

W. E. NIMS, P.E.
Director of Public Works

WEN/smw
23E1
cc: Mayor Hrdlicka

G.6 Agreement between City of Edmonds and City of Lynnwood – May 4, 1990

1115 AMENDMENT SIGNED

AMENDMENT TO AGREEMENT FOR JOINT USE OF SANITARY SEWERAGE FACILITIES BETWEEN CITY OF EDMONDS AND CITY OF LYNNWOOD

THIS AGREEMENT, made and executed this 4 day of May, 1990, by and between the Cities of Lynnwood and Edmonds, hereinafter referred to as "Lynnwood" and "Edmonds"; both being municipal corporations of the State of Washington and located in Snohomish County, Washington.

WITNESSETH:

WHEREAS, on October 26, 1982, Edmonds and Lynnwood entered into an agreement to accomplish the joint treatment and disposal of the sanitary sewage collected by the two cities, specifying the operation, maintenance, joint use and the payment thereof for those sewerage works facilities to be jointly used, and defining the rights, duties and obligations of the parties; and

WHEREAS, the October 26, 1982, agreement permits the serving City supplying sewerage facilities to the purchasing City to provide additional sewerage facilities to the purchasing City if the increase is deemed feasible based upon review of the reserve capacities of the serving City; and

WHEREAS, upon Edmonds' inquiry, Lynnwood requested that Edmonds reserve a maximum capacity for Lynnwood at the Edmonds treatment plant of two hundred (200) connections, an increase from the previously allocated one hundred nineteen (119) connections; and

WHEREAS, Edmonds requested that its capacity at the Lynnwood treatment plant be increased from six hundred twenty thousand (620,000) to nine hundred twenty thousand (920,000) gallons per day (hereinafter "gd"); and

WHEREAS, design capacity at the Lynnwood treatment plant was not increased by 300,000 gd for Edmonds; and

WHEREAS, instead of increasing the capacity, a diversion of Lynnwood flows will be made to vacate enough capacity at the Lynnwood treatment plant to accommodate up to three hundred thousand (300,000) additional gd for Edmonds; and

WHEREAS, Edmonds treatment plant has the capacity to accommodate a diversion of up to three hundred thousand (300,000) gd from Lynnwood for the purpose of freeing up capacity for the difference between six hundred twenty thousand (620,000) and nine hundred twenty thousand (920,000) gd to compensate for additional flows from Edmonds at the Lynnwood treatment plant; and

WHEREAS, Edmonds has the right to deliver six hundred twenty thousand (620,000) gd to the Lynnwood treatment plant; and

WHEREAS, Edmonds will not be required to participate in any further expansion of the Lynnwood treatment plant for capacity unless Edmonds' flows exceed nine hundred twenty thousand (920,000) gd;

NOW, THEREFORE, in consideration of the promises and the mutual covenants contained herein, the said parties hereby agree as follows:

Section 1. INCORPORATION OF PREVIOUS AGREEMENT.

This agreement will serve as an amendment to the October 26, 1982 Agreement for Joint Use of Sanitary Sewerage Facilities Between City of Edmonds and City of Lynnwood which is incorporated by reference as if fully set forth herein.

Section 2. DEFINITION OF TERMS.

For the purposes of the Agreement, the following are defined terms:

A. The term "diversion" shall mean the transmission of Lynnwood sewage flows to Edmonds beyond Lynnwood's allocated capacity at the Edmonds treatment plant for the purpose of vacating sufficient capacity in the Lynnwood treatment plant for Edmonds flows which exceed six hundred twenty thousand (620,000) gd.

Section 3. DELIVERY AND ACCEPTANCE OF ADDITIONAL SEWAGE.

Presently, each City is reserving a capacity of three hundred thousand (300,000) gd, based on average annual daily flows, in its wastewater treatment plant for the other city. Each party agrees that, at a time when Edmonds reaches the limit of its allocated capacity at the Lynnwood plant of six hundred twenty thousand (620,000) gd, Lynnwood shall make additional capacity available for Edmonds flows of up to three hundred thousand (300,000) additional gd, by diverting Lynnwood sewage to the Edmonds plant. The amount of sewage diverted from Lynnwood to Edmonds shall be approximately equal to the Edmonds flows to Lynnwood which are in excess of six hundred and twenty thousand (620,000) gd, but shall not exceed three hundred thousand (300,000) gd without prior written consent and agreement. Lynnwood agrees to be responsible for monitoring the capacity of its plant, to inform Edmonds when diversion becomes necessary, and to make arrangements for said diversion. The Lynnwood capacity at the Edmonds treatment plant is two hundred (200) connections. Edmonds will make available to Lynnwood additional capacity at the Edmonds plant, up to three hundred thousand (300,000) gd for the purpose of the flow diversion needed to provide Edmonds with additional capacity at the Lynnwood plant up to a limit of nine hundred and twenty thousand (920,000) gd.

Section 4. PAYMENT.

The payment plan agreed to by each party in the October 26, 1982 agreement is still in effect, in all its facets, subject to the following: The capital costs of providing three hundred thousand (300,000) gd capacity at each plant shall not be charged to the other city.

Section 5. EFFECTIVE DATE.

The provisions of this amendment shall become effective on the date this agreement is signed and the charges provided for herein commence on the effective date, unless other provisions have been made.

IN WITNESS WHEREOF, said parties have executed this agreement as of this 4 day of May, 1990.

CITY OF EDMONDS

By: _____
LARRY S. NAUGHTEN, Mayor

CITY OF LYNNWOOD

By: _____
M. J. HRDLICKA, Mayor

ATTEST:

By: _____
JACQUELINE G. PARRETT,
City Clerk

By: _____
ROBERT W. NOACK
City Clerk

LJS/nmc

949E1/3

G.7 Agreement between City of Edmonds and City of Lynnwood – August 15, 2011

INTERLOCAL AGREEMENT FOR DISPOSAL OF BIOSOLIDS BETWEEN THE CITY OF EDMONDS AND THE CITY OF LYNNWOOD

THIS AGREEMENT, is made this 15th day of August, 2011, by and between the City of Edmonds (hereinafter "Edmonds"), and the City of Lynnwood (hereinafter "Lynnwood"); and

WHEREAS, Edmonds has the facilities and expertise to treat and dispose of biosolid waste; and

WHEREAS, Lynnwood is in need of such facilities and expertise;

NOW, THEREFORE, in consideration of the mutual promises set forth herein, it is agreed by and between the parties as follows:

TERMS

1. Description of Program. Edmonds agrees to handle the disposal and treatment of biosolids delivered by Lynnwood in accordance with the terms and conditions attached as Exhibit A and incorporated by this reference as if set forth in full. The City of Edmonds, as operator of the plant, specifically reserves as set forth below the right to terminate this Agreement at any time and the City of Edmonds will terminate this Agreement, when, in its sole discretion, it determines that the disposal of solids hereunder would interfere with the smooth, efficient and cost effective operation of the secondary sewage treatment plant.

2. Payment.

A. When charges are pending, Edmonds shall submit a monthly payment invoice to Lynnwood for services to date, and Lynnwood shall make payments within thirty (30) days after the submittal of the invoice.

B. If Lynnwood objects to all or any portion of any invoice, it shall so notify Edmonds within thirty (30) days from the date of receipt and shall pay the portion of the invoice not in dispute. The parties shall immediately make every effort to settle the disputed portion. If they are unable to resolve their dispute, the parties agree to use an alternative dispute resolution procedure to resolve their differences.

C. The prices to be paid are set forth in the attached Exhibit A which has been incorporated by this reference as fully as if herein set forth. The charge for disposal of biosolids set forth in such Exhibit may be amended by the provision of thirty (30) days prior written notice from Edmonds to Lynnwood. Upon receipt of such notice, Lynnwood may terminate this agreement or, by continuing to ship biosolids for disposal, agree to the amendment of this agreement to incorporate such new and higher charge. In such event, Exhibit A shall be deemed amended to incorporate such new charge.

3. Duration. This Agreement shall become effective upon execution and shall remain in effect for an initial term until December 31, 2011. Unless terminated as provided below, the Agreement may continue in effect at the mutual agreement of the parties for up to two additional two-year terms to expire December 31, 2013 and December 31, 2015.

4. Termination. Either party may terminate this contract at any time upon sixty (60) days written notice. Edmonds reserves the right to refuse or suspend any biosolid delivery from Lynnwood at any time and for any length of time in accordance with plant operational needs. Paragraphs 2 and 5 shall survive termination of this Agreement.

5. Indemnification and Hold Harmless. It is understood and agreed that this Agreement is solely for the benefit of the parties hereto and gives no right to any other party. No joint venture or partnership is formed as a result of this Agreement. Each party hereto agrees to be responsible and assumes liability for its own negligent acts or omissions, and those of its officers, agents or employees, while performing work pursuant to this Agreement, to the fullest extent required by law, and agrees to save, indemnify, defend, and hold the other party harmless from any such liability. In the case of negligence of multiple parties, any damages allowed shall be assessed in proportion to the percentage of negligence attributable to each party, and each party shall have the right to seek contribution from the other party in proportion to the percentage of negligence attributable to the other party.

6. Miscellaneous Disclosures as Required by RCW 39.34.030. No separate legal entity shall be created by this Agreement, and each party hereto shall be responsible for its own budgeting of funds transferred under this Agreement. No property shall transfer ownership or be jointly owned as a result of this Agreement. Edmonds shall serve as the administrator of this Agreement.

7. Entire Agreement. The written provisions and terms of this Agreement, together with all Exhibits attached hereto, shall supersede all prior verbal statements of any officer or other representative of the parties, and such statements shall not be effective or be construed as entering into or forming a part of, or altering in any manner whatsoever, this Agreement.

8 Modification. No waiver, alteration or modification of any of the provisions of this Agreement shall be binding unless in writing and signed by duly authorized representatives of Edmonds and Lynnwood.

9. Waiver. Failure to insist upon strict compliance with any terms, covenants or conditions of this Agreement shall not be deemed a waiver of such, nor shall any waiver or relinquishment of such right or power at any time be taken to be a waiver of any other breach.

10. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. Any suit brought by either party arising out of this Agreement shall only be maintained in a court of competent jurisdiction

in Snohomish County, Washington.

11. Filing. This Agreement shall be filed with the Snohomish County Auditor as required by RCW 39.34.040.

IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year above written.

CITY OF EDMONDS

By: _____
Mayor Mike Cooper

ATTEST/AUTHENTICATED:

_____
SANDRA S. CHASE, City Clerk

APPROVED AS TO FORM:

_____
Office of the City Attorney

CITY OF LYNNWOOD

By: _____

ATTEST/AUTHENTICATED:

_____

APPROVED AS TO FORM:

_____
Lynnwood Attorney

EXHIBIT A

The City of Edmonds agrees to assist the City of Lynnwood with its biosolids disposal needs. Our approval is based upon the following conditions:

- Shipments will be received at a time agreed to by both agencies at least 24 hours in advance.
- The delivery route to the Edmonds Wastewater Treatment Plant (WWTP) will be from SR 104 west, right on Dayton Street, right on Second Avenue South.
- Lynnwood will be charged $0.25 per dry pound.
- Test results performed at Edmonds WWTP will be used for billing. The method for calculating the quantity received will be as follows: Lynnwood will split a sample taken during each tanker loading destined for the Edmonds WWTP. The biosolids hauler will deliver a sample to the Edmonds WWTP for solids concentration analysis. Quantity of liquid biosolids received will be measured using the flowmeter at the plant. Edmonds WWTP personnel will log all deliveries and pounds received each day.
- Edmonds WWTP will be responsible for unloading deliveries.
- If the solids concentration generated from Lynnwood changes significantly, Edmonds WWTP will be notified in advance.
- The City of Edmonds reserves the right to refuse deliveries if plant storage tank capacity is threatened.

APPENDIX H

Pre-Treatment Policy

Chapter 7.90
WASTEWATER PRETREATMENT – GENERAL PROVISIONS

Sections:

7.90.010 Purpose and policy.
7.90.020 Administration.
7.90.030 Definitions.
7.90.040 Abbreviations.

7.90.010 Purpose and policy.

A. Chapters 7.90 through 7.102 ECC set forth uniform requirements for users of the publicly owned treatment works (POTW) operated by the city of Edmonds, and enables the city to comply with all applicable state and federal laws, including the Clean Water Act (33 USC 1251 et seq.) and the General Pretreatment Regulations (40 CFR Part 403). The objectives of Chapters 7.90 through 7.102 ECC are:

1. To prevent the introduction of pollutants into the POTW that will interfere with the operation of the POTW;

2. To prevent the introduction of pollutants into the POTW which will pass through the POTW, inadequately treated, into receiving waters or otherwise be incompatible with the POTW;

3. To ensure that the quality of POTW sludge is maintained at a level which allows its use and disposal in compliance with applicable statutes and regulations;

4. To protect POTW personnel who may be affected by wastewater and sludge in the course of their employment and to protect the general public;

5. To improve the opportunity to recycle and reclaim wastewater and biosolids from the POTW; and

6. To promote strategies that reduce the amounts of pollution generated by users, thereby reducing the associated hazards to the POTW and receiving waters.

B. Chapters 7.90 through 7.102 ECC shall apply to all users of the POTW. Chapters 7.90 through 7.102 ECC define certain prohibited discharges; set forth local limits for use by state agencies in the issuance of wastewater discharge permits; authorize monitoring, compliance, and enforcement activities; establish administrative review procedures; require user reporting; and provide for the recovery of liquidated damages and collection of penalties. [Ord. 3401 § 1, 2002].

7.90.020 Administration.

Except as otherwise provided herein, the director shall administer, implement, and enforce the provisions of Chapters 7.90 through 7.102 ECC. Any powers granted to or duties imposed upon the director may be delegated by the director to other city of Edmonds personnel. [Ord. 3401 § 1, 2002].

7.90.030 Definitions.

Unless a provision explicitly states otherwise, the following terms and phrases, as used in Chapters 7.90 through 7.102 ECC, shall have the meanings hereinafter designated.

1. “Accessible,” when applied to required pretreatment monitoring or treatment equipment, shall mean direct access without the necessity of removing any panel, door, vehicle, equipment, materials, or other similar obstruction.

2. “Act” or “the Act” means the Federal Water Pollution Control Act, also known as the Clean Water Act, 33 USC 1251 et seq., as now exists or may hereafter be amended.

3. “Administrative penalty (fine)” means a punitive monetary charge unrelated to treatment cost, which is assessed by the director rather than by a court.

4. “AKART” is an acronym for “all known, available, and reasonable technology (prevention, control, and treatment) to prevent and control pollution of the waters of the state of Washington.” AKART shall represent the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge. AKART shall be applied by all users of the POTW. AKART includes best management practices and may be required by the director for any discharge to the POTW.

5. “Applicable pretreatment standards” means for any specified pollutant, the more stringent of the city's prohibitive standards, the city's specific pretreatment standards, the state of Washington's pretreatment standards, or applicable National Categorical Pretreatment Standards.

6. “Approval authority” means the state of Washington Department of Ecology.

7. Authorized Representative of the User.

a. If the user is a corporation:

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

ii. The manager of one or more manufacturing, production, or operation facilities, if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. If the user is a partnership or sole proprietorship: a general partner or proprietor, respectively;

c. If the user is a federal, state or local governmental facility: a director or highest official appointed or designated to oversee the operation and performance of the activities of the government facility, or his/her authorized designee;

d. The individuals described in subsections (a) through (c) of this definition may designate another authorized representative if the authorization is in writing, the authorization specifies the individual or position responsible for the overall operation of the facility from which the discharge originates or having overall responsibility for environmental matters for the company, and the written authorization is submitted to the city.

8. “Average daily flow” shall be defined as the arithmetical mean of the total process wastewater flow over a one-year period. This mean shall be calculated based on days when a discharge occurs.

9. “Best management practices (BMPs)” means the schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of “waters of the United States.” BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

10. “Biochemical oxygen demand (BOD)” means the quantity of oxygen utilized in the biochemical oxidation of organic matter amenable to measurement by the methods described in Standard Methods for the Examination of Water and Wastewater (current edition); under standard laboratory procedures for five days at 20 degrees centigrade, usually expressed as a concentration [milligrams per liter (mg/L)].

11. “Bypass” means the intentional diversion of wastestreams from any portion of a user's treatment facility.

12. “Categorical pretreatment standard” or “categorical standard” means any regulation containing pollutant discharge limits promulgated by the U.S. EPA in accordance with Sections 307(b) and (c) of the Act (33 USC 1317) which apply to a specific category of users and which appear in 40 CFR Chapter I, Subchapter N, Parts 405-471.

13. “Categorical user” means a user covered by one or more of the EPA's categorical pretreatment standards.

14. “City” means the city of Edmonds, Washington.

15. “Cooling water/noncontact cooling water” means water used for cooling purposes which does not come into direct contact with any raw material, intermediate product, waste product, or finished product. Cooling water may be generated from any use, such as air conditioning, heat exchangers, cooling or refrigeration to which the only pollutant added is heat.

16. “Color” means the optical density at the visual wavelength of maximum absorption, relative to distilled water. One hundred percent transmittance is equivalent to 0.0 optical density.

17. “Composite sample” means the sample resulting from the combination of individual wastewater samples taken at selected intervals based on an increment of either flow or time.

18. “Day” shall be defined as a calendar day.

19. “Department” means the Washington State Department of Ecology (DOE) or authorized representatives thereof. (DOE is also the definition of the “approval authority.”)

20. “Director” means the director of the city of Edmonds public works department, or his duly authorized representative or designee.

21. “Domestic sewage” means the liquid and waterborne wastes derived from ordinary living processes, free from industrial wastewaters, and of such character to permit satisfactory disposal, without special treatment, into the POTW.

22. “Domestic user (residential user)” means any person who contributes, causes, or allows the contribution of wastewater into the city POTW that is of a similar volume and/or chemical makeup as that from a residential dwelling unit. Discharges from a residential dwelling unit typically include up to 100 gallons per capita per day at 250 mg/L of BOD and TSS.

23. “Environmental Protection Agency (EPA)” means the U.S. Environmental Protection Agency or, where appropriate, the Regional Water Management Division Director, or other duly authorized official of said agency.

24. Existing Source. For a categorical user, an “existing source” is any source of discharge, the construction or operation of which commenced prior to the publication by EPA of proposed categorical pretreatment standards, which will be applicable to such source if the standard is thereafter promulgated in accordance with Section 307 of the Act.

25. Existing User. For noncategorical users an “existing user” is defined as any user which is discharging wastewater prior to July 15, 2002.

26. “Fats, oils and grease (FOG)” means the term fats, oils, and grease shall mean those components of wastewater amenable to measurement by the methods described in Standard Methods for the Examination of Water and Wastewater (current edition). The term “fats, oils and grease” shall include polar and nonpolar fats, oils, and grease and other components extracted from wastewater by these methods.

27. “Food service facility” means any facility which prepares and/or packages food for sale or consumption, on- or off-site, with the exception of private residences. Food service facilities shall include, but are not limited to: food manufacturers, food packagers, restaurants, grocery stores, bakeries, lounges, hospitals, hotels, nursing homes, churches, schools, and all other food service facilities not listed above.

28. “Grab sample” means a sample which is taken from a wastestream on a one-time basis without regard to the flow in the wastestream and without consideration of time.

29. “Grease interceptor” means a device located underground and outside of a food service facility designed to collect, contain or remove food wastes and grease from the wastestream while allowing the balance of the liquid waste to discharge to the sewer system.

30. “Grease trap” means a device located in a food service facility or under a sink designed to collect, contain or remove food wastes and grease from the wastestream while allowing the balance of the liquid waste to discharge to the sewer system.

31. “High strength waste” means any waters or wastewater having a concentration of biochemical oxygen demand (BOD) or total suspended solids (TSS) in excess of 250 mg/L.

32. “Indirect discharge” or “discharge” means the introduction of pollutants into the POTW from any nondomestic source regulated under Section 307(b), (c), or (d) of the Act. The discharge into the POTW is normally by means of pipes, conduits, pumping stations, force mains, constructed drainage ditches, surface water intercepting ditches, and all constructed devices and appliances appurtenant thereto.

33. “Industrial wastewater” means water or liquid-carried waste from any industry, manufacturing operation, trade, or business which includes any combination of process wastewater, cooling water, contaminated stormwater, contaminated leachates, or other waters such that the combined effluent differs in some way from purely domestic sewage, or is subject to regulation under federal categorical pretreatment standards, the state waste discharge permit program, or Chapters 7.90 through 7.102 ECC.

34. “Interceptor” means a device designed and installed so as to separate and retain deleterious or undesirable matter from normal wastes and permit normal liquid wastes to discharge to the sewer system.

35. “Interference” means a discharge which alone or in conjunction with a discharge or discharges from other sources, either:

a. Inhibits or disrupts the POTW, its treatment processes or operations;

b. Inhibits or disrupts its sludge processes, use or disposal; or

c. Is a cause of a violation of the city's NPDES permit or of the prevention of sewage sludge use or disposal in compliance with any of the following statutory or regulatory provisions or permits issued thereunder:

i. Section 405 of the Clean Water Act;

ii. The Solid Waste Disposal Act (SWDA), including Title II commonly referred to as the Resource Conservation and Recovery Act (RCRA);

iii. The Code of Federal Regulations Title 40 Part 503, Standards for the Use or Disposal of Sewage Sludge;

iv. Any state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA;

v. The Clean Air Act;

vi. The Toxic Substances Control Act;

vii. And the Marine Protection, Research, and Sanctuaries Act.

36. “Lateral” means that portion of the sewage conveyance system from the point it exits the user's facility to the point where it connects to the POTW main line. Also known as a “side sewer.”

37. “Liquid waste” is the discharge from any appliance, appurtenance, or other fixture in connection with a plumbing system that does not receive fecal matter.

38. “Maximum allowable discharge limit” means the maximum concentration (or loading) of a pollutant allowed to be discharged at any time.

39. “May” means a permissive or discretionary directive.

40. “Medical wastes” means isolation wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, contaminated bedding, surgical wastes, potentially contaminated laboratory wastes, and dialysis wastes.

41. “New source” means:

a. Any building, structure, facility, or installation from which there is (or may be) a discharge of pollutants, the construction of which commenced after the publication of applicable categorical standards, provided, that:

i. The building, structure, facility, or installation is constructed at a site at which no other source is located; or

ii. The building, structure, facility, or installation totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or

iii. The production or wastewater generating processes of the building, structure, facility, or installation are substantially independent of an existing source at the same site. In determining whether these are substantially independent, factors such as the extent to which the new facility is integrated with the existing plant, and the extent to which the new facility is engaged in the same general type of activity as the existing source should be considered.

b. Construction on a site at which an existing source is located results in a modification rather than a new source, if the construction does not create a new building, structure, facility, or installation meeting the criteria of subsection (41)(a)(ii) or (iii) above but otherwise alters, replaces, or adds to existing process or production equipment.

c. Construction of a new source as defined under this paragraph has commenced if the owner or operator has:

i. Begun, or caused to begin as part of a continuous on-site construction program;

A. Any placement, assembly, or installation of facilities or equipment; or

B. Significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for the placement, assembly, or installation of new source facilities or equipment; or

ii. Entered into a binding contractual obligation for the purchase of facilities or equipment that are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under this definition.

42. “New user” is not necessarily a “new source” and is defined as a user that applies to the city for a new building permit or any person who occupies an existing building and plans to discharge wastewater to the city's collection system after July 15, 2002. Any person that buys an existing facility that is discharging nondomestic wastewater will be considered an “existing user” if no significant changes are made in the operation.

43. “Ordinance, this,” as used in Chapters 7.90 through 7.102 ECC, shall mean the provisions of Chapters 7.90 through 7.102 ECC.

44. “Pass through” means a condition occurring when discharges from users (singly or in combination) exit the POTW in quantities or concentrations which either: (1) cause a violation of any requirement of a city NPDES or state waste discharge permit; (2) cause an increase in the magnitude or duration of a violation; or (3) cause a violation of any water quality standard for waters of the state promulgated under state regulations including Chapter 173-201A WAC.

45. “Permittee” means a person or user issued a wastewater discharge permit or discharge authorization.

46. “Person” means any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity, or any other legal entity, or their legal representatives, agents, or assigns. This definition includes all federal, state, or local governmental entities.

47. “pH” means a measure of the acidity or alkalinity of a substance, expressed in standard units. (Technically defined as the logarithm of the reciprocal of the mass of hydrogen ions in grams per liter of solution.)

48. “Pollutant” means any substance discharged into a POTW or its collection system which, if discharged directly, would alter the chemical, physical, biological or radiological properties of waters of the state of Washington, including pH, temperature, taste, color, turbidity, oxygen demand, toxicity or odor. This includes any discharge likely to create a nuisance or render such waters harmful, detrimental or injurious to any beneficial uses, terrestrial or aquatic life, or to public health, safety or welfare.

49. “Pretreatment” means the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to (or in lieu of) introducing such pollutants into the POTW. This reduction or alteration can be obtained by physical, chemical, or biological processes; by process changes; or by other means (except by diluting the concentration of the pollutants, unless allowed by an applicable pretreatment standard).

50. “Pretreatment requirements” means any substantive or procedural local, state, or federal requirement related to pretreatment developed under Chapter 90.48 RCW and/or Sections 307 and 402 of the Clean Water Act.

51. “Pretreatment standards” or “standards” means any pollutant discharge limitations including categorical standards, state standards, and limits of ECC 7.91.040 applicable to the discharge of nondomestic wastes to the POTW. The term shall also include the prohibited discharge standards of Chapters 7.90 through 7.102 ECC, WAC 173-216-060, and 40 CFR Part 403.5.

52. “Process wastewater” means industrial wastewater minus cooling water/noncontact cooling water.

53. “Prohibited discharge standards” or “prohibited discharges” means absolute prohibitions against the discharge of certain substances; these prohibitions appear in ECC 7.91.010(A) and (B).

54. “Publicly owned treatment works (POTW)” means a “treatment works,” as defined by Section 212 of the Act (33 USC 1292) which is owned by the city. This definition includes all devices, facilities, or systems used in the collection, storage, treatment, recycling, and reclamation of sewage or industrial wastewaters of a liquid nature and any conveyances that convey wastewater to a treatment plant. The term also means the city of Edmonds wastewater treatment plant.

55. “Sanitary flow” means sewage.

56. “Septic tank waste” means any domestic and/or residential sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.

57. “Sewage” means water-carried human wastes or a combination of water-carried wastes from residences, business buildings, institutions and industrial establishments, together with such gray water (household showers, dishwashing operations, food preparation, etc.) as may be present.

58. “Sewer” means any pipe, conduit, ditch, or other device used to collect and transport sewage from the generating source.

59. “Shall” means a mandatory directive.

60. Side Sewer. See “Lateral.”

61. “Significant industrial user (SIU)” means:

a. A user subject to categorical pretreatment standards; or

b. A user that:

i. Discharges an average daily flow of 25,000 GPD or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater); or

ii. Contributes a process wastestream which makes up five percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or

iii. Is designated as such by the department with input from the city on the basis that it, alone or in conjunction with other sources has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.

c. Upon a finding that a user meeting the criteria in subsection (b) of this definition has no reasonable potential for adversely affecting the POTW's operation or for violating any applicable pretreatment standard or requirement, the department may at any time, on its own initiative or in response to a petition received from a user or the city [and in accordance with procedures in 40 CFR 403.8(f)(6)] determine that such user should not be considered a significant industrial user.

62. “Significant noncompliance (SNC)” shall refer to a violation or pattern of violation of one of the following natures:

a. Chronic violations of wastewater discharge limits, defined here as those in which 66 percent or more of all wastewater measurements taken during a six-month period exceed the daily maximum limit or average limit for the same pollutant parameter by any amount;

b. Technical review criteria (TRC) violations, defined here as those in which 33 percent or more of all wastewater measurements taken for each pollutant parameter during a six-month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the

applicable TRC [1.4 for BOD, TSS, fats, oils and grease, and 1.2 for all other pollutants except pH];

c. Any other discharge violation that the city believes has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of city personnel or the general public);

d. Any discharge of pollutant that has caused imminent endangerment to human health, welfare or to the environment, or has resulted in the city's exercise of its emergency authority to halt or prevent such a discharge;

e. Failure to meet, within 90 days after the scheduled date, a compliance schedule milestone contained in a wastewater discharge permit or enforcement order for starting construction, completing construction, or attaining final compliance;

f. Failure to provide within 30 days after the due date, any required reports, including baseline monitoring reports, periodic self-monitoring reports, and reports on compliance with compliance schedules;

g. Failure to accurately report noncompliance; or

h. Any other violation(s) that the director determines will adversely affect the operation or implementation of the local pretreatment program.

63. “Slug load” means any discharge at a flow rate or concentration which could cause a violation of the discharge standards in ECC 7.91.010 through 7.91.040 or any discharge of a nonroutine, episodic nature, including but not limited to, an accidental spill or a noncustomary batch discharge, or any discharge greater than or equal to five times the amount or concentration allowed by permit or Chapters 7.90 through 7.102 ECC.

64. “Standard industrial classification (SIC) code” means a classification pursuant to the Standard Industrial Classification Manual issued by the United States Office of Management and Budget, as now exists or as may hereafter be amended.

65. “State” means the state of Washington.

66. “Stormwater” means any flow occurring during or following any form of natural precipitation, and resulting from such precipitation, including snowmelt.

67. “Total suspended solids” means the total suspended matter that floats on the surface of, or is suspended in, water, wastewater, or other liquid, and which is removable by laboratory filtering and is amenable to measurement by the methods described in Standard Methods for the Examination of Water and Wastewater (current edition).

68. “Toxic pollutant” means one of the pollutants, or combination of those pollutants, listed as toxic in regulations promulgated by EPA under Section 307 (33 USC 1317) of the Act, or other pollutants as may be promulgated.

69. “Treatment plant effluent” means the discharge from the city's POTW.

70. “Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with applicable pretreatment standards because of factors beyond the reasonable control of the user.

71. “User” or “industrial user” means a source of indirect discharge. The source shall not include “domestic user” as defined herein.

72. “Wastewater” means liquid and water-carried industrial wastewaters and sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or untreated, which are contributed to the POTW.

73. “Wastewater discharge permit (industrial wastewater discharge permit, discharge permit, discharge authorization)” means an authorization or equivalent control document issued by the department to users discharging wastewater to the POTW. The permit may contain appropriate pretreatment standards and requirements as set forth in Chapters 7.90 through 7.102 ECC.

74. “Wastewater treatment plant” or “treatment plant” or “pollution control facility” means that portion of the POTW that is designed to provide treatment of municipal sewage and industrial wastewater.

75. “Zero discharge permit” means a permit for a categorical user that operates its processes so that no industrial wastewater is discharged to the POTW. [Ord. 3487 § 1, 2004; Ord. 3401 § 1, 2002].

7.90.040 Abbreviations.

The following abbreviations shall have the designated meanings:

AKART	All known available and reasonable technology
ASPP	Accidental spill prevention plan
BMPs	Best management practices
BOD	Biochemical oxygen demand
CFR	Code of Federal Regulations
COD	Chemical oxygen demand
EPA	U.S. Environmental Protection Agency
FOG	Fats, oils, and grease
gpd	Gallons per day
l	Liter

LEL	Lower explosive limit
mg	Milligrams
mg/L	Milligrams per liter
MSDS	Material safety and data sheet
NOV	Notice of violation
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Administration
POTW	Publicly owned treatment works
RCRA	Resource Conservation and Recovery Act, 42 USC 6901 et seq.
RCW	Revised Code of Washington
SIC	Standard Industrial Classifications
SIU	Significant industrial user
SNC	Significant noncompliance
SWDA	Solid Waste Disposal Act, Chapter 70.95 RCW
TSS	Total suspended solids
UPC	Uniform Plumbing Code
USC	United States Code
WAC	Washington Administrative Code

With regards to abbreviations contained in this chapter, the use of the singular shall be construed to include the plural and the plural shall include the singular as indicated by the context of its use. [Ord. 3487 § 2, 2004; Ord. 3401 § 1, 2002].

Chapter 7.91
WASTEWATER PRETREATMENT – GENERAL REQUIREMENTS

Sections:

7.91.010 Prohibited discharge standards.
7.91.020 Federal categorical pretreatment standards.
7.91.030 State requirements.
7.91.040 Local limits.
7.91.050 City's right of revision.
7.91.060 Special agreement.
7.91.070 Dilution.
7.91.080 Pretreatment facilities.
7.91.090 Deadline for compliance with applicable pretreatment requirements.
7.91.100 Additional pretreatment measures.
7.91.110 Accidental discharge/slug control plans.
7.91.120 Septic tank wastes.

7.91.010 Prohibited discharge standards.

A. General Prohibitions. No user or domestic user shall introduce or cause to be introduced into the POTW any pollutant or wastewater that causes pass through or interference. These general prohibitions apply to all users of the POTW whether or not they are subject to categorical pretreatment standards or any other national, state, or local pretreatment standards or requirements.

B. Specific Prohibitions. No user or domestic user shall introduce or cause to be introduced into the POTW the following pollutants, substances, or wastewater:

1. Pollutants which may create a fire or explosive hazard in the POTW, including, but not limited to, wastestreams with a closed-cup flashpoint of less than 140 degrees Fahrenheit (60 degrees Celsius) using the test methods specified in 40 CFR 261.21;

2. Wastewater having a pH less than 5.0 or more than 11.0, or otherwise causing corrosive structural damage to the POTW or equipment;

3. Solid or viscous substances in amounts which will cause obstruction of the flow in the POTW resulting in interference but in no case solids greater than one-quarter inch;

4. Pollutants, including oxygen-demanding pollutants (BOD, etc.), released in a discharge at a flow rate and/or pollutant concentration which, either singly or by interaction with other pollutants, will cause interference with the POTW;

5. Wastewater having a temperature which will inhibit biological activity in the treatment plant resulting in interference, but in no case wastewater which causes the temperature at the introduction into the treatment plant to exceed 104 degrees Fahrenheit (40 degrees Celsius);

6. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through;

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

8. Trucked or hauled pollutants (including sanitary wastes and grease wastes) unless authorized by the director in writing;

9. Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;

10. Wastewater which imparts color which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions, which consequently imparts color to the treatment plant's effluent, thereby violating the city's NPDES permit. Color (in combination with turbidity) shall not cause the treatment plant effluent to reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonably established norm for aquatic life;

11. Wastewater containing any radioactive wastes or isotopes except as specifically approved in writing by the director in compliance with applicable state or federal regulations;

12. Stormwater, surface water, ground water, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, noncontact cooling water, and unpolluted wastewater, unless specifically authorized in writing by the director;

13. Any sludges, screenings, or other residues from the pretreatment of industrial or commercial wastes or from industrial or commercial processes, except as authorized in writing by the director;

14. Medical wastes, except as specifically authorized in writing by the director;

15. Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to exhibit toxicity in an analytical test;

16. Detergents, surface-active agents, or other substances in amounts which may cause excessive foaming in the POTW;

17. Any liquid, solids, or gases which by reason of their nature or quantity are, or may be, sufficient either alone or by interaction with other substances to cause fire or explosion or be injurious in any other way to the POTW or to the operation of the POTW. At no time shall two successive readings on an explosion meter, at the point of discharge into the system (or at any

point in the system), be more than five percent nor any single reading over 10 percent of the lower explosive limit (LEL) of the meter;

18. Animal guts or tissues, paunch manure, bones, hair, hides or fleshings, entrails, whole blood, feathers, ashes, cinders, sand, spent lime, stone or marble dusts, metal, glass, straw, shavings, grass clippings, rags, spent grains, spent hops, waste paper, wood, plastics, gas, tar asphalt residues, residues from refining or processing of fuel or lubricating oil, mud, or glass grinding or polishing wastes;

19. Any substance that will cause the POTW to violate its NPDES and/or other disposal system permits;

20. Any wastewater, which in the opinion of the director can cause harm either to the sewers, sewage treatment process, or equipment; have an adverse effect on the receiving stream; or can otherwise endanger life, limb, public property, or constitute a nuisance, unless authorized in a wastewater discharge permit;

21. The contents of any tank or other vessel commercially owned or used by any person in the business of collecting or pumping sewage, effluent, septage, or other wastewater, unless said person has first obtained testing and approval as may be generally required by the city of Edmonds and paid all fees assessed for the privilege of said discharge;

22. Any hazardous or dangerous wastes as defined in rules published by the state of Washington (Chapter 173-303 WAC) and/or in EPA rules 40 CFR Part 261;

23. Persistent pesticides and/or pesticides regulated by the Federal Insecticide Fungicide Rodenticide Act (FIFRA);

24. Any slug load;

25. Any substance that may cause the POTW's effluent or treatment residues, sludges, or scums to be unsuitable for reclamation and reuse, or to interfere with the reclamation process;

26. Fats, oils and grease in amounts that may cause obstructions or maintenance problems in the collection/conveyance system, or interference in the POTW.

C. Pollutants, substances, or wastewater prohibited by this chapter shall not be processed or stored in such a manner that they are likely to be discharged to the POTW unless the user has in place an approved accidental spill prevention plan (ASPP)/slug control plan. [Ord. 3401 § 2, 2002].

7.91.020 Federal categorical pretreatment standards.

National categorical pretreatment standards as adopted and hereafter amended by the EPA pursuant to the Act shall be met by all users in the regulated industrial categories. These standards, found in 40 CFR

Chapter I, Subchapter N, Parts 405-471, as the same now exists or is hereinafter amended, are hereby incorporated by reference. [Ord. 3401 § 2, 2002].

7.91.030 State requirements.

A. State requirements and limitations on discharges to the POTW shall be met by all users which are subject to such standards in any instance in which they are more stringent than federal requirements and limitations, or those in Chapters 7.90 through 7.102 ECC or other applicable ordinances. This includes the requirement to meet AKART as defined herein whenever applicable and more stringent than the limits of ECC 7.91.040, and to comply with the requirements of Chapter 7.92 ECC.

B. Any user determined by the city to qualify as a significant industrial user shall file an application for a state waste discharge permit with the department in accordance with the requirements of WAC 173-216-070. Proof of acceptance of the application, and payment of permit fees shall be kept at the user's facilities, and produced upon request by the city. Failure to submit the application or rejection of the application by the department may be considered sufficient grounds to terminate or refuse to provide sewer service. [Ord. 3401 § 2, 2002].

7.91.040 Local limits.

A. The following pollutant limits are established to protect against pass through and interference. No person shall discharge wastewater containing in excess of the following daily maximum allowable discharge limits:

arsenic	0.36	mg/L
cadmium	0.27	mg/L
chromium	1.99	mg/L
copper	2.98	mg/L
cyanide	0.29	mg/L
lead	1.09	mg/L
mercury	0.07	mg/L
nickel	2.14	mg/L
silver	1.44	mg/L
zinc	5.13	mg/L
nonpolar fats, oils, and grease (NPFOG)	100	mg/L

B. The above limits apply at the point where the wastewater is discharged to the POTW (i.e., end of the user's pipe). Categorical pretreatment standards apply at the end of the process. However, the director may elect to have local limits apply after pretreatment and/or prior to mixing with dilution flows.

C. All concentrations for metallic substances are for “total” metal unless indicated otherwise. The department may impose mass limitations in addition to (or in place of) the concentration-based limitations above.

D. Where a user is subject to a categorical pretreatment standard and a local limit for a given pollutant, the more stringent limit or applicable pretreatment standard shall apply. [Ord. 3487 § 3, 2004; Ord. 3401 § 2, 2002].

7.91.050 City's right of revision.
The city reserves the right to establish more stringent standards or requirements on discharges to the POTW. [Ord. 3401 § 2, 2002].

7.91.060 Special agreement.
A. The city reserves the right to enter into written agreements with users to accept pollutants compatible with the treatment system at concentrations greater than those typical of domestic wastewater. Within such agreements, the city may establish terms of the user's discharge to the POTW including maximum flow rates and concentrations. The city may also establish fees to recover costs associated with treating such wastes and monitoring schedules in such agreements, as provided by ECC 7.102.010. In no case will a special agreement waive compliance with a state or federal pretreatment standard or requirement including federal categorical pretreatment standards.

B. Users discharging or intending to discharge pollutants other than BOD and TSS, and claiming compatibility, must prove to the satisfaction of the director that such pollutants are compatible with the POTW. The director may require any claim of compatibility to be endorsed by the department. [Ord. 3401 § 2, 2002].

7.91.070 Dilution.
A user shall not increase the use of process water, or in any way attempt to dilute a discharge, as a partial or complete substitute for adequate treatment to achieve compliance with an applicable pretreatment standard or requirement unless expressly authorized by an applicable pretreatment standard or requirement. The director may request the department to impose mass limitations on users, which he believes may be using dilution to meet applicable pretreatment standards or requirements, or in other cases when the imposition of mass limitations is appropriate. [Ord. 3401 § 2, 2002].

7.91.080 Pretreatment facilities.
A. General Pretreatment Requirements.

1. Users shall procure and properly install, operate, and maintain the wastewater facilities which combined with appropriate practices are necessary to achieve AKART as defined herein. Such pretreatment facilities shall be designed to achieve compliance with all applicable pretreatment standards and requirements set out in Chapters 7.90 through 7.102 ECC within the time limitations specified by the EPA, the state, or the director, whichever is more stringent.

2. Detailed plans showing the pretreatment facilities and operating procedures shall be submitted to the department for review and approval in accordance with the procedures of Chapter 173-240 WAC, and shall be submitted to the city before construction of the facility. The review of such plans and operating procedures will in no way relieve the user from the responsibility of modifying the facility as necessary to produce an acceptable discharge to the city and/or the department and meet discharge limitations under the provisions of Chapters 7.90 through 7.102 ECC. Any facilities required to pretreat wastewater to a level acceptable to the city shall be provided, operated, and maintained at the user's expense.

3. Users shall comply with approved engineering reports, plans and specifications, and operations and maintenance manuals, and shall modify such documents to reflect any proposed modifications of industrial wastewater (pretreatment) facilities. Users shall submit proposals to modify pretreatment facilities to the department before implementation in accordance with Chapter 173-240 WAC. Users shall submit a copy of such revised plans and the department's acceptance to the director before implementing changes to approved pretreatment facilities. The director may audit the compliance of any user, and require changes in operating procedures deemed necessary by the director to ensure continued compliance with applicable pretreatment standards and requirements.

4. New sources, and new users determined to be SIUs, must have pretreatment facilities installed and operating prior to discharge, if required.

5. Users who operate restaurants, cafes, lunch counters, delis, cafeterias, bars, or clubs; or hotel, hospital, sanitarium, factory or school kitchens; butcher shops; grocery stores or other establishments where food (polar) grease may be introduced to the sewer system shall have pretreatment facilities to prevent the discharge of fat, oil, and grease. Such pretreatment facilities shall be either a grease interceptor or grease trap as determined by the director, and installed in the wastewater line leading from sinks, drains, or other fixtures where grease may be discharged.

6. Users who operate automobile or truck repair facilities, steam cleaning facilities for motorized equipment, air compressor(s), or any other establishments or equipment where petroleum based (nonpolar) grease and oil may be introduced to the sewer system shall have pretreatment facilities to prevent the discharge of oil and grease. These pretreatment facilities shall be oil/water separators or interceptors located to collect such mixture of grease, oil, and water. Such facilities shall be in accordance with city and state standards.

7. Oil or grease of petroleum or mineral origin (nonpolar) shall not be discharged to the city's sewer system at a concentration in excess of 100 mg/L.

8. A plumbing permit is required for the installation of a grease trap. Fee schedule on file with city clerk's office.

9. A side sewer permit is required for the installation of a grease interceptor. Fee schedule on file with the city clerk's office.

B. Pretreatment Requirements for FOG.

1. The wholesale shredding and subsequent discharge of food wastes into the POTW is prohibited. Dry scraping dishes and cooking ware and the installation of flat screens and/or baskets in the prerinse, preparation and pot sinks is encouraged to reduce the solid waste load and the discharge of fats and oils. A food or garbage disposal unit, if used, must be connected to a grease interceptor, which may require more frequent cleaning due to the increased solid waste load. A food or garbage disposal unit shall not be used in a facility that is served by a grease trap. For purposes of this section, a food or garbage disposal unit is any device designed to chop, cut, or grind food and other waste material and discharge such waste to the wastewater drainage system.

2. Users that recycle fats, oils and grease must do so in a way that complies with all applicable state, city, and health department regulations.

3. The director will determine the type of grease removal equipment required according to the following criteria:

a. For new facilities: After February 16, 2004, food service facilities which are newly proposed or constructed, or existing facilities which will be expanded or renovated to include a food service facility where such facility did not previously exist, shall be required to install, operate and maintain a grease interceptor. The director may, in his or her sole discretion, allow new facilities to install a grease trap instead of a grease interceptor according to the following criteria:

i. A grease trap may be utilized instead of a grease interceptor if it is demonstrated to the satisfaction of the director that the installation of a grease interceptor is physically impracticable. For purposes of this determination, “physically impracticable” shall include, but is not necessarily limited to, the following conditions: (A) the lack of available space on the premises; (B) unavoidable interference from underground utilities or structures; and (C) topographical conditions such as slope that unavoidably prevent installation of a grease interceptor.

ii. A grease trap may be utilized instead of a grease interceptor if both of the following conditions are present: (A) the city's interceptor sizing formula results in a required capacity of 500 gallons or less for the facility; and (B) the facility has a seating capacity of 60 or less; provided, that if either condition subsequently ceases to exist, the director may require said facility to install a grease interceptor.

Notwithstanding the above, nothing herein shall be construed as requiring the director to allow a grease trap in lieu of a grease interceptor.

b. For existing facilities: Subject to the provisions of this subsection, food service facilities operating prior to February 16, 2004, shall be permitted to install, operate, and maintain grease traps that are properly sized and installed according to the city's guidelines in lieu of grease interceptors. However, the director may, in his or her sole discretion, require an existing facility to install a grease interceptor if the facility meets one or both of the following conditions: (A) continues to deposit FOG in the wastewater collection system; or (B) repeatedly violates BMPs or maintenance standards.

i. Continued FOG deposition: The facility shall be notified in writing by the director if it must upgrade to a properly sized and installed grease trap. Immediately following the allowable period for installation and upgrade, the director may begin evaluation of performance and FOG removal effectiveness by inspection of the affected sewer main line and lateral or by other appropriate means. If the facility is found to still be contributing FOG in quantities and at a projected deposition rate sufficient to necessitate cleaning the affected portion of the city's wastewater collection system more frequently than once every five years, or if the lateral continues to require cleaning one or more times per year to prevent grease blockages, then the director may require installation of a grease interceptor.

ii. Violation of maintenance standards or BMPs: If the facility demonstrates an unwillingness or incapacity to apply appropriate BMPs or to conduct proper grease trap maintenance by receiving four or more written notices of violation within a 12-month period, or six or more within a 24-month period, then the director may require installation of a grease interceptor in addition to or in lieu of any other fees, penalties, or other enforcement action.

iii. The director shall give written notification to a facility that is required to install a grease interceptor and shall require such installation to be completed within 12 months of receipt of written notification.

iv. Approval by the director of proposed grease removal equipment does not in any way guarantee that this equipment will function in the manner described by its constructor or manufacturer; nor shall it relieve a person or facility of the responsibility of replacing, enlarging, or otherwise modifying such equipment to accomplish the intended purpose. Approval by the director to install and operate a grease trap shall not be construed to mean that a grease interceptor may not subsequently be required according to the aforementioned criteria.

c. Exempt facilities: The director, in his or her sole discretion, may grant exemption from the requirement for grease removal equipment to facilities that have little or no potential to contribute oil and grease to the wastewater collection system because they do not cook or prepare food. The director may revoke a facility's exemption if that facility's operation changes to include cooking or food preparation or if it becomes apparent that FOG is being discharged and accumulating in the facility's lateral or the POTW main line.

4. The use of any additive, such as enzymes, chemicals, or bacteria, as a substitute for grease traps or interceptors or the maintenance of grease traps or interceptors is prohibited. In no case shall any additive that emulsifies fats, oils or grease be used. Any use of additives as a supplement to grease interceptors shall first be authorized in writing by the director prior to their use by the facility owner or the grease hauler. MSDS sheets and any other applicable information concerning the composition, frequency of use and mode of action of the proposed additive shall be sent to the city together with a written statement outlining the proposed use of the additive(s). Based upon the information received and any other information solicited from the potential user or supplier, the city shall allow or deny the use of the additive in writing. Permission to use any specific additive may be withdrawn by the city at any time if violations of this chapter occur that can be demonstrated to be due to the use of the additive.

5. Alternative grease/oil removal systems may be approved in writing by the director on a case-by-case basis to augment or replace grease interceptors to achieve acceptable discharge. Testing of alternative devices to demonstrate acceptable removal of FOG shall be at the expense of the user.

6. Authorized city employees shall be allowed ready access at all reasonable times to all parts of the user's premises for the purpose of inspection, observation, records examination, measurement, sampling and testing in accordance with the provisions of Chapters 7.90 through 7.102 ECC. The refusal of any user to allow the director entry to or upon the user's premises for purposes of inspection, sampling effluents or inspecting and copying records or performing such other duties as shall be required by Chapters 7.90 through 7.102 ECC shall constitute a violation of Chapters 7.90 through 7.102 ECC. The director may seek a warrant or use such other legal procedures as may be advisable and reasonably necessary to discharge his duties under Chapters 7.90 through 7.102 ECC.

7. Inspections. City employees may inspect the user's premises on both an unscheduled and unannounced basis or on a scheduled basis to ascertain whether the intent of Chapters 7.90 through 7.102 ECC is being met and all requirements are being complied with. The official may also determine if the facility has implemented best management practices as fully as possible. Inspections may include all equipment, food processing and storage areas and shall pay special attention to the processes that produce wastewater which is discharged from the facility through the grease interceptor/trap. The official may also inspect the interceptor/trap maintenance record, other pertinent data, the grease interceptor/trap and may check the level of the

interceptor/trap contents and/or take samples as necessary. Noted deficiencies may include but not be limited to:

a. Failure to properly maintain the grease interceptor or trap in accordance with the provision of Chapters 7.90 through 7.102 ECC.

b. Failure to record pumping activities or keep copies of manifest forms or receipts.

c. Failure to maintain logs, files, records or access for inspection or monitoring activities.

8. Reinspections. The city official shall reinspect users' facilities that received deficiency notices at a previous inspection. The city official shall inspect the repairs or other deficiencies and shall provide written notice of compliance or noncompliance as the case may be. In the event of continuing noncompliance, successive reinspections will be scheduled and appropriate fees shall be charged to the user concerned. A first reinspection shall be performed after a minimum of 30 working days has elapsed to allow for corrective action by the user to be completed.

9. Monitoring. The city shall have the right to inspect a facility's lateral or to sample and analyze the wastewater from any facility at any time to determine compliance with the requirements of the city code and to evaluate the performance and effectiveness of equipment and procedures to remove FOG from the waste stream. Evidence of the deposition of FOG in the facility's lateral or the city's sewer line may cause enforcement action to be initiated, and the city's monitoring costs may be billed to the user.

10. If a failure to maintain grease traps or interceptors, results in partial or complete blockage of the building sewer, private sewer system discharging to the city sewer system, or other parts of the city sewer system, or adversely affects the treatment or transmission capabilities of the POTW, or requires excessive maintenance by the city, or poses a possible health hazard, the discharger responsible for the facilities shall be subject to the remedies herein, including cost recovery, enforcement and penalties.

C. Grease Traps. All grease trap installations must meet the following criteria:

1. Trap Design and Location. Grease traps shall conform to the standards in the current edition of the UPC. Grease traps shall be installed in strict accordance with the manufacturer's instructions. Grease traps shall be equipped with a cover and a mechanism for a secure closing. Flow control devices shall be required where the water flow through the grease trap may exceed its rated flow. Dishwashers and food or garbage disposal units shall not be connected to grease traps. No more than four fixtures shall connect to an individual grease trap. Grease traps shall be located in the facility's sewer line between all fixtures which may introduce grease into the sewer system and the connection to the city's wastewater collection system. Wastewater from sanitary

facilities and other similar fixtures shall not be introduced into the grease trap under any circumstances.

2. Trap Capacity. The required flow capacity of the grease trap in gallons per minute shall be determined according to sizing guidelines adopted by the director. The director may require installation of a grease trap having a greater capacity than that indicated by said guidelines if deemed necessary to protect the city's sewer system.

3. Flow Control Device. Grease traps shall be equipped with a device to control the rate of flow through the unit. The rate of flow shall not exceed the manufacturer's rated capacity recommended in gallons per minute for the unit.

4. Inspection, Cleaning and Maintenance. Each facility shall be solely responsible for the cost of trap installation, inspection, cleaning and maintenance. Each facility may contract with a grease hauler, or it may develop a written protocol and perform its own grease trap cleaning and maintenance procedures. Cleaning and maintenance must be performed when the total volume of captured grease and solid material displaces more than 25 percent of the total volume of the unit. Each facility shall determine the frequency at which their grease trap shall be cleaned, but all grease traps shall be opened, inspected, cleaned and maintained at a minimum of once per week. However, the director, in his or her sole discretion, may authorize in writing a different schedule based upon the rate at which 25 percent of the unit's volume is displaced by retained grease and solids as determined by inspections.

5. Inspection. Grease traps may be inspected by the city as necessary to assure compliance with Chapters 7.90 through 7.102 ECC and to assure proper cleaning and maintenance schedules are being adhered to.

6. Repairs. The facility shall be responsible for the cost and scheduling of all repairs to its grease trap(s). Repairs required by the city shall be completed within 14 working days after the date of written notice of required repairs is received by the facility. Users may utilize a different schedule for repair upon prior written approval from the city.

7. Disposal. Grease and solid materials removed from a grease trap shall be disposed of in the solid waste disposal system.

8. Record Keeping. The facility shall maintain records of the date and time of all cleaning and maintenance of each grease trap, and shall make this record available for inspection by the city on demand.

D. Grease Interceptors. All grease interceptor installations must meet the following criteria:

1. Interceptor Design and Location. Grease interceptors shall conform to the standards in the current edition of the UPC. Grease interceptors shall have a minimum of two compartments and

shall be capable of separation and retention of grease and storage of settled solids. Extended inlet and outlet sanitary tees must be; provided, that extend down to within 12 inches from the bottom of the tank. The owner/operator must provide, at his or her sole expense, an access manhole over each compartment for monitoring purposes. The inlet and outlet tees must be a minimum of six inches in diameter, and the influent and effluent flow must be visible and easily accessible from the access manhole for sampling. Covers shall have a gastight fit. The grease interceptor shall be designed, constructed and installed for adequate load-bearing capacity. Grease interceptors shall be located in the facility's lateral sewer line between all fixtures which may introduce grease into the sewer system and the connection to the city's wastewater collection system. Such fixtures shall include but not be limited to: sinks, dishwashers, automatic hood wash units, floor drains in food preparation and storage areas, and any other fixture which is determined to be a potential source of grease. Wastewater from sanitary facilities and other similar fixtures shall not be introduced into the grease interceptor under any circumstances. Interceptors shall be installed in a location outside of the building which provides easy access at all times for inspections, cleaning and proper maintenance, including pumping. The director is authorized to adopt additional criteria and specifications for grease interceptors.

2. Interceptor Capacity. Grease interceptor capacity calculations shall be performed by each facility based on size and type of operation according to the formulas contained in the sizing guidelines adopted by the director. The minimum capacity of any one unit shall be 500 gallons and the maximum capacity of any one unit shall be 4,000 gallons.

3. Inspection, Pumping and Maintenance. Each facility shall be responsible for the costs of installing, inspecting, cleaning and maintaining its grease interceptor. All facilities that have grease interceptors shall utilize a grease hauler. Pumping services shall include the complete removal of all contents, including floating materials, wastewater, and bottom sludges and solids. Decanting or discharging of removed wastes back into the grease interceptor from which the wastes were removed, or into any other grease interceptor, for the purpose of reducing the volume to be disposed of is strictly prohibited. Grease interceptor cleaning shall include removal of excessive solids from the walls, floors, baffles and all pipework. Each facility shall ensure that all fittings and fixtures inside the interceptor are in good condition and functioning properly after the pumping procedure, and that the unit is filled with enough clean, cool tap water to prevent any FOG from passing through the unit as it fills.

4. Interceptor Pumping Frequency. Each facility shall clean its grease interceptor at a minimum frequency of once every 90 days. Each facility shall determine the frequency at which its grease interceptor shall be pumped according to the following criteria:

a. When the floatable grease layer exceeds 12 inches in depth as measured in the inlet compartment; or

b. When the total volume of captured grease and solid material displaces more than 25 percent of the capacity of the interceptor as measured in the inlet compartment; or

c. When the interceptor is not retaining/capturing oils and greases; or the removal efficiency of the device, as determined through sampling and analysis, is less than 80 percent.

5. Cleaning Variance. If a facility believes that quarterly pumping of their grease interceptor is unnecessary in order to remain in compliance with the criteria of subsection (D)(4) of this section, the facility may make written application to the director for a written variance from the quarterly pumping requirements. City employees will review cleaning maintenance records and perform physical inspections of the interceptor as needed to verify compliance with subsection (D)(4) of this section. The city will base the new cleaning frequency schedule upon observed accumulation for the user requesting the variance.

6. Inspection. Grease interceptors may be inspected by the city as necessary to assure compliance with Chapters 7.90 through 7.102 ECC and to assure proper cleaning and maintenance schedules are being adhered to.

7. Repairs. The facility shall be responsible for the cost and scheduling of all repairs to its grease interceptor(s). Repairs required by the city shall be completed within 14 working days after the date of written notice of required repairs is received by the facility or other schedule upon written approval from the city.

8. Disposal. Wastes removed from each grease interceptor shall be disposed of at a facility that is permitted to receive such wastes. Grease or gray water shall not be returned to any grease interceptor, private sewer line or to any portion of the city's wastewater collection system.

9. Record Keeping. Each facility shall maintain records of the date and time of all cleaning and maintenance of each grease interceptor, and shall make this record available for inspection by the city on demand.

E. Other Interceptors.

1. Dischargers who operate automatic and coin-operated laundries, car washes, filling stations, commercial garages or similar businesses having any type of washing facilities (including pressure washing and steam cleaning) or any other dischargers producing grit, sand, oils, lint, or other materials which have the potential of causing partial or complete obstruction of the building side sewer or other areas in the POTW shall, upon order of the director, install approved interceptors, oil/water separators, or tanks in accordance with specifications adopted by the city of Edmonds such that excessive amounts of oil, sand and inert solids are effectively prevented from entering the POTW.

2. Installation and Maintenance. All grease interceptors, oil/water separators, settling tanks and grit traps shall be properly installed, maintained and operated by the discharger at his own expense. The installation shall be kept in continuous operation at all times, and shall be maintained in a manner that shall prevent oil or grease, and inert solids from being carried into the sewer system at all times. A service contractor qualified to perform such cleaning must perform cleaning. All material removed shall be disposed of in accordance with all state and federal regulations. Records and certification of maintenance shall be made readily available to the director for review and inspection, and must be maintained for a minimum of three years.

3. If a failure to maintain settling tanks, grit traps, grease interceptors, or oil/water separators results in partial or complete blockage of the building sewer, private sewer system discharging to the city sewer system, or other parts of the city sewer system, or adversely affects the treatment or transmission capabilities of the POTW, or requires excessive maintenance by the city, or poses a possible health hazard, the discharger responsible for the facilities shall be subject to the remedies herein, including cost recovery, enforcement and penalties. [Ord. 3487 § 4, 2004; Ord. 3401 § 2, 2002].

7.91.090 Deadline for compliance with applicable pretreatment requirements.

A. Pretreatment Facilities for FOG. All restaurants, cafes, lunch counters, delis, cafeterias, bars, or clubs; or hotel, hospital, sanitarium, factory or school kitchens; butcher shops; or other establishments where food (polar) grease may be introduced to the sewer system which do not have grease traps or interceptors, or do not have adequately sized or correctly installed traps or interceptors shall meet the requirement for removal of fats, oils, and grease by installing or properly connecting an approved grease trap or interceptor, as determined by the director.

Facilities that are required to install approved grease interceptors shall do so within 12 months after receiving written notification from the director.

Facilities that are allowed to install approved grease traps or to upgrade existing trap installations, as provided elsewhere in this chapter, shall do so within 90 days after receiving written notification from the director.

Facilities which are newly proposed or constructed after February 16, 2004, shall meet the requirements in this chapter for installation of grease removal equipment prior to commencement of discharge.

B. Significant Industrial Users. Compliance by existing sources (categorical users) covered by categorical pretreatment standards shall be within three years of the date the standard is effective unless a shorter compliance time is specified in the appropriate standard. The department shall establish a final compliance deadline date for any categorical user when the local limits for said user are more restrictive than EPA's categorical pretreatment standards.

New source dischargers, and “new users” that are determined to be SIUs, are required to comply with applicable pretreatment standards within the shortest feasible time (not to exceed 90 days from the

beginning of discharge). New sources, and “new users” that are determined to be SIUs, shall install and have in operating condition, and shall “start-up” all pollution control equipment required to meet applicable pretreatment standards before beginning to discharge. [Ord. 3487 § 5, 2004; Ord. 3401 § 2, 2002].

7.91.100 Additional pretreatment measures.

A. Whenever deemed necessary, the director may require users to restrict their discharge during peak flow periods, designate that certain wastewater be discharged only into specific sewers, relocate and/or consolidate points of discharge, separate sewage wastestreams from industrial wastewater streams, and such other conditions as may be necessary to protect the POTW and determine the user's compliance with the requirements of Chapters 7.90 through 7.102 ECC.

B. When determined necessary by the director, each user discharging into the POTW shall install and maintain, on his property and at his expense, a suitable storage and flow-control facility to ensure equalization of flow. The director may require the facility to be equipped with alarms and a rate of discharge controller, the regulation of which shall be determined by the director. A wastewater discharge permit or discharge authorization may be issued solely for flow equalization.

C. Grease, oil, and sand interceptors shall be provided when, in the opinion of the director, they are necessary for the proper handling of wastewater containing excessive amounts of grease and oil, or sand; except that such interceptors shall not be required for residential users. All interception units shall be of type and capacity approved by the director and shall be so located to be easily accessible for cleaning and inspection. Such interceptors shall be inspected, cleaned, and repaired regularly, as needed, by the user at his expense.

D. Users with the potential to discharge flammable substances may be required to install and maintain an approved combustible gas detection meter. [Ord. 3401 § 2, 2002].

7.91.110 Accidental discharge/slug control plans.

A. The director may require any user to install, properly operate and maintain, at its own expense, facilities to prevent slug loads or accidental discharges of pollutants to the POTW. The director may require users to produce and/or implement spill plans developed in compliance with applicable OSHA, health, fire, and department regulations applicable to discharges to POTWs. Where deemed necessary by the director, facilities to prevent accidental discharge or slug discharges of pollutants shall be provided and maintained at the user's cost and expense. When such plans are required by the director, they shall contain at least the following elements:

1. Description of discharge practices, including nonroutine batch discharges;

2. Description of stored chemicals;

3. Procedures for immediately notifying the POTW of any accidental or slug discharge. Such notification must also be given for any discharge which would violate any of the standards in ECC 7.91.010 through 7.91.040; and

4. Procedures to prevent adverse impact from any accidental or slug discharge. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment for emergency response.

B. Users shall notify the Edmonds wastewater treatment plant orally or in writing immediately upon the occurrence of a slug load or “accidental discharge” of substances regulated by Chapters 7.90 through 7.102 ECC. The notification shall include location of discharge, date and time thereof, type of waste, concentration and volume, and corrective actions. Any affected user shall be liable for any expense, loss, or damage to the POTW, in addition to the amount of any fines imposed on the city on account thereof under state or federal law.

C. Within seven days following an accidental discharge, the user shall submit to the director a detailed written report describing the cause of the discharge and the measures to be taken by the user to prevent similar future occurrences. Such notification shall not relieve the user of any expense, loss, damage, or other liability which may be incurred as a result of damage to the POTW, fish kills, or any other damage to person or property; nor shall such notification relieve the user of any fines, civil penalties, or other liability which may be imposed by Chapters 7.90 through 7.102 ECC or other applicable law.

D. Signs shall be permanently posted in conspicuous places on the user's premises advising employees whom to call in the event of a slug or accidental discharge. Employers shall instruct all employees who may cause or discover such a discharge with respect to emergency notification procedures. [Ord. 3401 § 2, 2002].

7.91.120 Septic tank wastes.

No septic tank wastes shall be discharged to the POTW. [Ord. 3401 § 2, 2002].

APPENDIX K

NPDES Permit

Issuance Date:	October 30, 2009
Effective Date:	December 1, 2009
Expiration Date:	October 30, 2014
Modification Date:	May 9, 2012

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM WASTE DISCHARGE PERMIT No. WA0024058

State of Washington
DEPARTMENT OF ECOLOGY
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

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

City of Edmonds Wastewater Treatment Plant
200 Second Avenue S.
Edmonds, WA 98020

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

Plant Location: 200 Second Avenue S. Edmonds, WA 98020	Receiving Water: Puget Sound Central Basin	
Discharge Location:		
Outfall 001:	North Diffuser	South Diffuser
Latitude:	47º 48' 47" N	47º 48' 42" N
Longitude:	122º 23' 25" W	122º 23' 27" W
Plant Type: Conventional Activated Sludge		

Kevin C. Fitzpatrick
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

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SUMMARY OF PERMIT REPORT SUBMITTALS

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

Permit Section	Submittal	Frequency	First Submittal Date
S3.A	Discharge Monitoring Report	1/month	November 15, 2009
S3.E	Reporting Permit Violations	As necessary	
S4.B	Plans for Maintaining Adequate Capacity	As necessary	
S4.D	Notification of New or Altered Sources	As necessary	
S4.E	Infiltration and Inflow Report	1/year	June 30, 2010
S5.G	Operations and Maintenance Manual	As necessary	
S6.E	Characterization of Industrial Users	1/permit cycle	October 1, 2012
S8.B	Acute Toxicity Effluent Test Results with Permit Renewal Application	2/permit cycle	Testing to occur during June 2013 and December 2013. Submit reports with renewal application.
S9.B	Chronic Toxicity Effluent Test Results with Permit Renewal Application	2/permit cycle	Testing to occur during August 2013 and February 2014. Submit reports with renewal application.
S10	Application for Permit Renewal	1/permit cycle	April 1, 2014
G1	Notice of Change in Authorization	As necessary	
G4	Reporting Planned Changes	As necessary	
G5	Engineering Report for Construction or Modification Activities	As necessary	

SPECIAL CONDITIONS

In this permit, the word "must" denotes an action that is mandatory and is equivalent to the word "shall" used in previous permits.

S1. DISCHARGE LIMITS

A. Effluent Limits

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

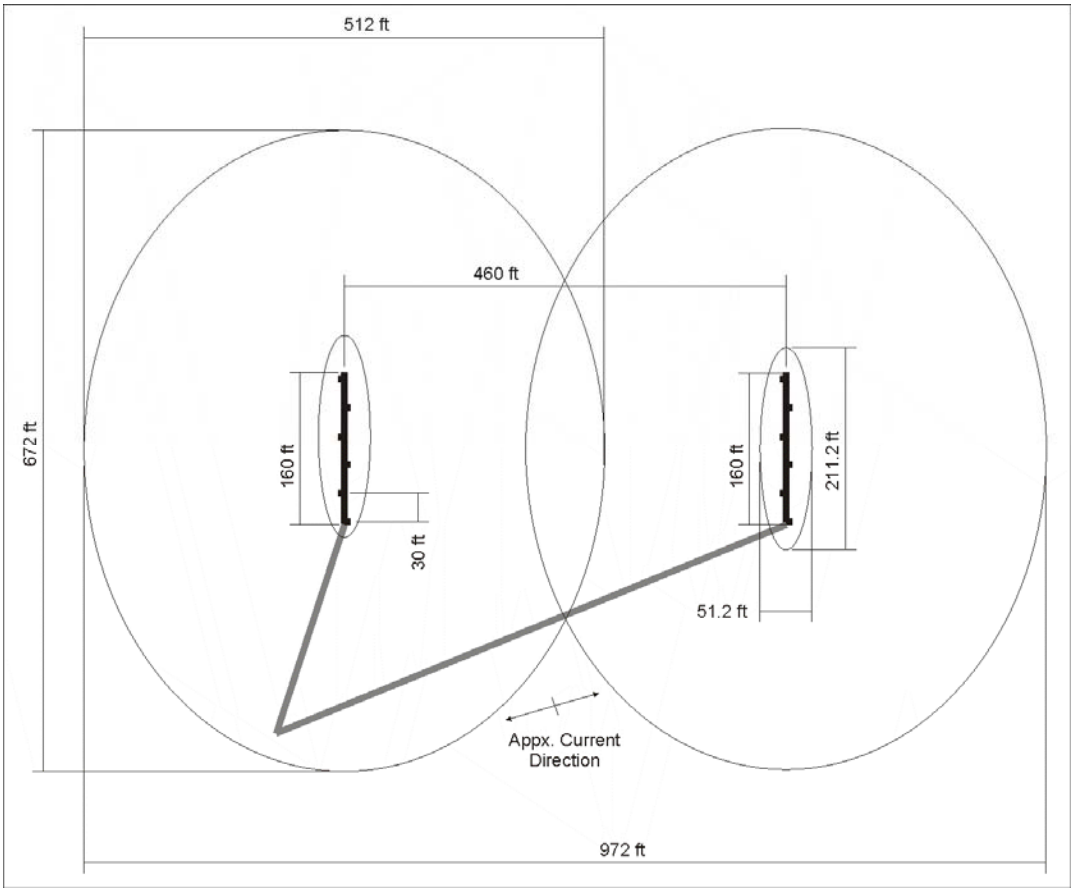
Beginning on the effective date of this permit and lasting through the expiration date, the Permittee may discharge municipal wastewater at the permitted location subject to compliance with the following limits:

EFFLUENT LIMITS: OUTFALL # 001		
Parameter	**Average Monthly [a]**	**Average Weekly [b]**
Carbonaceous Biochemical Oxygen Demand (5-day)	25 mg/L, 2460 lbs/day 85% removal of influent $CBOD_5$	40 mg/L, 3936 lbs/day
Total Suspended Solids	30 mg/L, 2952 lbs/day 85% removal of influent TSS	45 mg/L, 4430 lbs/day
Fecal Coliform Bacteria [c]	200/100 mL	400/100 mL
pH [d]	Daily minimum is equal to or greater than 6.0 and the daily maximum is less than or equal to 9.0.	
Parameter	**Average Monthly**	**Maximum Daily [e]**
Total Residual Chlorine	191 µg/L	442 µg/L

a	Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured. See footnote [c] for fecal coliform calculations.
b	Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. See footnote [c] for fecal coliform calculations.
c	To calculate the average monthly and average weekly values for fecal coliforms, you must use the geometric mean. Ecology gives directions to calculate this value in publication No. 04-10-020, *Information Manual for Treatment Plant Operators*, available at: http://www.ecy.wa.gov/pubs/0410020.pdf
d	Indicates the range of permitted values. The Permittee must report the instantaneous maximum and minimum pH monthly. Do not average pH values.
e	Maximum daily effluent limit means the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day. For concentration units of measurement, the daily discharge is the average measurement of the pollutant over the day. This does not apply to pH.

B. Mixing Zone Authorization

The following paragraphs define the maximum boundaries of the mixing zones for Outfall #001. Descriptions apply for both the north and south diffusers. The following diagram illustrates the relationship and sizes of the chronic and acute mixing zones around the two diffusers.



Chronic Mixing Zone

WAC 173-201A-400(7)(b)(i) specifies mixing zones must not extend in any horizontal direction from the discharge ports for a distance greater than 200 feet plus the depth of water over the discharge ports, as measured during mean lower low water (MLLW). As illustrated above, the mixing zone consists of oval-shaped regions centered on each diffuser line. This permit authorizes the chronic mixing zone to occupy a region measuring 972 feet in length in the direction perpendicular to the diffuser lines and 672 feet in length in the direction parallel to the diffuser lines. The mixing zone extends from the seabed to the top of the water surface. Chronic aquatic life criteria and human health criteria must be met at the edge of the chronic zone.

Acute Mixing Zone

WAC 173-201A-400(8)(b) specifies that in estuarine waters a zone where acute criteria may be exceeded must not extend beyond 10% of the distance established for the maximum or chronic zone as measured independently from the discharge ports. The acute mixing zones are oval regions around each diffuser line that extends no more than 25.6 feet measured from the center of each discharge port. The mixing zone extends from the seabed to the top of the water surface. Acute aquatic life criteria must be met at the edge of the acute zone.

Available Dilution (dilution factor)	
Acute Aquatic Life Criteria	37
Chronic Aquatic Life Criteria	143
Human Health Criteria – Carcinogen	143
Human Health Criteria – Non-carcinogen	143

S2. MONITORING REQUIREMENTS

A. Monitoring Schedule

The Permittee must monitor in accordance with the following schedule and must use the laboratory method, detection level (DL), and quantitation level (QL) specified in Appendix A. Alternative methods from 40 CFR Part 136 are acceptable if the DL and QL are equivalent to those specified in Appendix A:

Parameter	Units	Minimum Sampling Frequency	Sample Type
(1) Wastewater Influent			
Wastewater Influent means the raw sewage flow. Sample the wastewater entering the headworks of the treatment plant excluding any side-stream returns from inside the plant.			
Flow	MGD	Daily	Continuous [a]
BOD_5	mg/L	1/Week	24-hr Composite [b]
BOD_5	lbs/day	1/Week	Calculated [f]
$CBOD_5$	mg/L	3/Week [e]	24-hr Composite [b]
TSS	mg/L	3/Week [e]	24-hr Composite [b]
TSS	lbs/day	3/Week [e]	Calculated [f]
(2) Final Wastewater Effluent			
Final Wastewater Effluent means wastewater which is exiting, or has exited, the last treatment process or operation. Typically, this is after or at the exit from the chlorine contact chamber or other disinfection process. The Permittee may take effluent samples for the CBOD analysis before or after the disinfection process. If taken after, dechlorinate and reseed the sample.			

Parameter	Units	Minimum Sampling Frequency	Sample Type
$CBOD_5$	mg/L	3/Week [e]	24-hr Composite [b]
$CBOD_5$	lbs/day	3/Week [e]	Calculated [f]
$CBOD_5$	% removal	Monthly [g]	Calculated [c]
TSS	mg/L	3/Week [e]	24-hr Composite [b]
TSS	lbs/day	3/Week [e]	Calculated [f]
TSS	% removal	Monthly [g]	Calculated [c]
Chlorine	mg/L	Daily	Grab [d]
Fecal Coliform	Organisms /100 ml	3/Week [e]	Grab [d]
pH	Standard Units	Daily	Grab [d]
Temperature	°C	3/Week [e]	Grab [d]
Temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which is usually in the late afternoon.			
(3) Whole Effluent Toxicity Testing – Final Wastewater Effluent			
Acute Toxicity Testing	See Condition S8 for testing requirements.	2/permit cycle	24-hr Composite [b]
Chronic Toxicity Testing	See Condition S9 for testing requirements.	2/permit cycle	24-hr Composite [b]
(4) Effluent Characterization – Final Wastewater Effluent			
Total Ammonia	mg/L N	Monthly [g]	24-hr Composite [b]
Total Kjeldahl Nitrogen	mg/L N	Monthly [g]	24-hr Composite [b]
Nitrate-Nitrite Nitrogen	mg/L N	Monthly [g]	24-hr Composite [b]
Ortho-Phosphorus (PO_4)	mg/L P	Monthly [g]	24-hr Composite [b]
Total Phosphorus	mg/L P	Monthly [g]	24-hr Composite [b]
(5) Permit Application Requirements – Final Wastewater Effluent			
Temperature	Degrees Celsius	As required above	As required above
$CBOD_5$	mg/L	As required above	As required above
Fecal Coliform	Organisms /100ml	As required above	As required above
Total Ammonia	mg/L N	As required above	As required above
Total Residual Chlorine	mg/L	As required above	As required above
Dissolved Oxygen	mg/L	Once per year	Grab [d]
Total Kjeldahl Nitrogen	mg/L N	As required above	As required above
Nitrate plus Nitrite N	mg/L N	As required above	As required above
Oil and Grease	mg/L	Once per year	Grab [d]
Phosphorus (Total)	mg/L P	As required above	As required above
Total Dissolved Solids	mg/L	Once per year	24-hr Composite [b]
Total Hardness	mg/L	Once per year [h]	24-hr Composite [b]
Cyanide	µg/L	Once per year [h]	24-hr Composite [b] or Grab [d]

Parameter	Units	Minimum Sampling Frequency	Sample Type
Total Phenolic Compounds	µg/L	Once per year [h]	24-hr Composite [b]
Priority Pollutants (PP) - metals	µg/L	Once per year [h]	24-hr Composite [b] or Grab [d]
PP – Volatile Organic Compounds	µg/L	Once per year [h]	Grab [d]
PP – Acid-extractable compounds	µg/L	Once per year [h]	24-hr Composite [b]
PP – Base-neutral compounds	µg/L	Once per year [h]	24-hr Composite [b]
The Permittee must record and report the wastewater treatment plant flow discharged on the day it collects the sample for priority pollutant testing with the discharge monitoring report.			

Footnotes for Monitoring Tables	
a	Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance. The Permittee must sample every hour when continuous monitoring is not possible.
b	24-hour composite means a series of individual samples collected over a 24-hour period into a single container, and analyzed as one sample.
c	Calculate the percent (%) removal of BOD and TSS using the following algorithm (concentrations in mg/L): (Average Monthly Influent Concentration - Average Monthly Effluent Concentration)/Average Monthly Influent Concentration.
d	Grab means an individual sample collected over a fifteen (15)-minute, or less, period.
e	3/week means three (3) times during each calendar week and on a rotational basis throughout the days of the week, except weekends and holidays.
f	Calculation means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in MGD) X Conversion Factor (8.34) = lbs/day
g	Monthly means once every calendar month during alternate weeks.
h	See Appendix A for the required detection (DL) or quantitation (QL) levels. Report single analytical values below detection as “less than (detection level)” where (detection level) is the numeric value specified in attachment A. Report single analytical values between the agency-required detection and quantitation levels with qualifier code of j following the value. To calculate the average value (monthly average): • Use the reported numeric value for all parameters measured between the agency-required detection value and the agency-required quantitation value. • For values reported below detection, use one-half the detection value if the lab detected the parameter in another sample for the reporting period. • For values reported below detection, use zero if the lab did not detect the parameter in another sample for the reporting period. If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific MDL and a QL to Ecology with appropriate laboratory documentation.

B. Sampling and Analytical Procedures

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

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136. The Permittee has demonstrated through comparative analysis that Hach Method 10360 "*Luminescence Measurement of Dissolved Oxygen in Water and Wastewater*" produces results equivalent to methods listed in 40 CFR Part 136. This permit authorizes the use of the Hach method listed above for BOD_5 and $CBOD_5$ analysis.

C. Flow Measurement

The Permittee must:

1. Select and use appropriate flow measurement devices and methods consistent with accepted scientific practices.

2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard and the manufacturer's recommendation for that type of device.

3. Calibrate flow monitoring devices at the minimum frequency recommended by the device manufacturer. Permittee must calibrate flow devices at a minimum frequency of at least one calibration per year if the manufacturer does not provide specific recommendations.

4. Maintain calibration records for at least three years.

D. Laboratory Accreditation

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

S3. REPORTING AND RECORDING REQUIREMENTS

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

A. Reporting

The first monitoring period begins on the effective date of the permit. The Permittee must:

1. Submit monitoring results each month.

2. Summarize, report, and submit monitoring data obtained during each monitoring period on a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by Ecology.

3. Submit DMR forms monthly whether or not the facility was discharging. If the facility did not discharge during a given monitoring period, submit the form as required with the words "NO DISCHARGE" entered in place of the monitoring results.

4. Ensure that DMR forms are postmarked or received by Ecology no later than the 15th day of the month following the completed monitoring period, unless otherwise specified in this permit.

5. Submit priority pollutant analysis data no later than forty-five (45) days following the monitoring.

6. Send report(s) to Ecology at:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

All laboratory reports providing data for organic and metal parameters must include the following information: sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), laboratory practical quantitation limit (PQL), reporting units, and concentration detected. Analytical results from samples sent to a contract laboratory must include information on the chain of custody, the analytical method, QA/QC results, and documentation of accreditation for the parameter.

B. Records Retention

The Permittee must retain records of all monitoring information for a minimum of three (3) years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

C. Recording of Results

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

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

2. The individual who performed the sampling or measurement.

3. The dates the analyses were performed.

4. The individual who performed the analyses.

5. The analytical techniques or methods used.

6. The results of all analyses.

D. Additional Monitoring by the Permittee

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

E. Reporting Permit Violations

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

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

- If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within thirty (30) days of sampling.

1. Immediate Reporting

The Permittee must **immediately** report any failure of the disinfection system, any collection system overflows which may reach marine surface waters, or any plant bypass discharging to a shellfish area to the Department of Ecology and the Department of Health, Shellfish Program at the numbers listed below:

Department of Ecology Northwest Regional Office	425-649-7000
Department of Health, Shellfish Program	360-236-3330 (business hours) 360-786-4183 (24 hours)

2. Twenty-four-hour Reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at 425-649-7000, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

a. Any noncompliance that may endanger health or the environment, unless previously reported under subpart 1, above.

b. Any unanticipated **bypass** of the treatment system, including any partial bypass of primary-treated wastewater around secondary treatment when flows exceed peak capacity of the secondary system. Notification is required under this condition regardless of whether the bypass exceeds any effluent limitation in the permit (See Part S5.F, "Bypass Procedures").

c. Any **upset** that exceeds any effluent limitation in the permit (See G.15, "Upset").

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

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

3. Report Within Five Days

The Permittee must also provide a written submission within five days of the time that the Permittee becomes aware of any event required to be reported under subparts 1 or 2, above. The written submission must contain:

a. A description of the noncompliance and its cause.

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

c. The estimated time noncompliance is expected to continue if it has not been corrected.

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

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

4. Waiver of Written Reports

Ecology may waive the written report required in subpart 3, above, on a case-by-case basis upon request if a timely oral report has been received.

5. All Other Permit Violation Reporting

The Permittee must report all permit violations, which do not require immediate or within 24-hour reporting, when it submits monitoring reports for S3.A ("Reporting"). The reports must contain the information listed in paragraph E.3, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

6. Report Submittal

The Permittee must submit reports to the address listed in S3.

F. Other Reporting

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

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

G. Maintaining a Copy of This Permit

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

S4. FACILITY LOADING

A. Design Criteria

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

Maximum Month Design Flow (MMDF)	11.8 MGD
Peak Daily Design Flow (PDDF)	21.5 MGD
BOD_5 influent loading for maximum month	20,000 lb/day
TSS influent loading for maximum month	19,200 lb/day

B. Plans for Maintaining Adequate Capacity

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

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

2. The projected increase would reach design capacity within five years.

   The plan and schedule for continuing to maintain capacity must be sufficient to achieve the effluent limits and other conditions of this permit. This plan must identify any of the following actions or any other actions necessary to meet the objective of maintaining capacity.

   a. 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.

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

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

   d. Modification or expansion of facilities necessary to accommodate increased flow or waste load.

   e. 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 Ecology prior to any construction.

C. Duty to Mitigate

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

D. Notification of New or Altered Sources

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

   a. Would interfere with the operation of, or exceed the design capacity of, any portion of the POTW;

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

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

2. This notice must include an evaluation of the 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 Report

1. The Permittee must submit to Ecology a report summarizing progress made in implementing I/I corrective measures identified in the *City of Edmonds 2006 Sanitary Sewer Comprehensive Plan*. The intent of this report is to provide a brief update on the status of projects. The report must present an updated schedule for projects, identify completed projects, and identify changes in project priority. The Permittee must submit the report by June 30, 2010, and annually thereafter.

S5. OPERATION AND MAINTENANCE

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

A. Certified Operator

This permitted facility must be operated by an operator certified by the State of Washington for at least a Class IV plant. This operator must be in responsible charge of the day-to-day operation of the wastewater treatment plant. An operator certified for at least a Class III plant must be in charge during all regularly-scheduled shifts.

B. O & M Program

The Permittee must:

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

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

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

C. Short-term Reduction

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during noncritical water quality periods and carry this maintenance out in a manner approved by Ecology.

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

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

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

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

D. Electrical Power Failure

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

The Permittee must maintain Reliability Class II (EPA 430/9-74-001) at the wastewater treatment plant. Reliability Class II requires a backup power source sufficient to operate all vital components and critical lighting and ventilation during peak wastewater flow conditions. Vital components used to support the secondary processes (i.e., mechanical aerators or aeration basin air compressors) need not be operable to full levels of treatment, but must be sufficient to maintain the biota.

E. Prevent Connection of Inflow

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

F. Bypass Procedures

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

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

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limits or other conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee must submit prior notice, if possible, at least ten (10) 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. No feasible alternatives to the bypass exist, such as:

      - The use of auxiliary treatment facilities.
      - Retention of untreated wastes.
      - Stopping production.

- Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass.

- Transport of untreated wastes to another treatment facility or preventative maintenance, or transport of untreated wastes to another treatment facility.

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

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

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

- A description of the bypass and its cause.
- An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.

- A cost-effectiveness analysis of alternatives, including comparative resource damage assessment.

- The minimum and maximum duration of bypass under each alternative.

- A recommendation as to the preferred alternative for conducting the bypass.

- The projected date of bypass initiation.

- A statement of compliance with SEPA.

- A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.

- Details of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

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

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

- If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

- If feasible alternatives to bypass exist, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

- If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve or deny the request. Ecology will give the public an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Ecology will approve a request to bypass by issuing an Administrative Order under RCW 90.48.120.

G. Operation and Maintenance Manual

The Permittee must:

1. Keep the Ecology-approved Operation and Maintenance Manual at the permitted facility.

2. Follow the instructions and procedures of this manual, including any modified instructions and procedures deemed appropriate by the treatment plant's manger.

3. Review the O&M Manual at least annually to ensure contents reflect current equipment and systems used at the facility.

4. Submit to Ecology for review and approval substantial changes or updates to the O&M Manual whenever such changes are incorporated into the manual.

S6. PRETREATMENT

A. General Requirements

The Permittee must work with Ecology to ensure that all commercial and industrial users of the publicly owned treatment works (POTW) comply with the pretreatment regulations in 40 CFR Part 403 and any additional regulations that the Environmental Protection Agency (U.S. EPA) may promulgate under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act.

B. Duty to Enforce Discharge Prohibitions

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

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

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

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

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

   d. Any pollutant, including oxygen-demanding pollutants (BOD, 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 degrees Centigrade (104 degrees Fahrenheit) unless Ecology, upon request of the Permittee, approves, in writing, alternate temperature limits.

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

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

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

   a. Noncontact cooling water in significant volumes.

   b. Stormwater and other direct inflow sources.

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

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

C. Wastewater Discharge Permit Required

The Permittee must require all non-domestic discharges to apply for a permit, and may not allow any significant industrial users (SIUs) to discharge wastewater to the Permittee's sewer system until such user has received a wastewater discharge permit from Ecology in accordance with Chapter 90.48 RCW and Chapter 173-216 WAC.

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

1. The Permittee must take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging or proposing to discharge to the Permittee's sewer system (see Appendix B of the fact sheet for definitions).

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

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

E. Characterization of Industrial Users

The Permittee must submit a report to Ecology that characterizes the types of commercial and industrial businesses that contribute flow to the Permittee’s treatment plant. The intent of this report is to document the potential influence non-domestic wastewater sources have on the treatment plant. The report must also describe steps the Permittee currently takes to manage non-domestic wastewater flows to the facility from sources that do not meet the criteria of “significant industrial user.” Permittee must

submit report to Ecology by October 1, 2012. If, during the development of this report, the Permittee identifies any existing or new Significant Industrial Users, the Permittee must notify Ecology of those users as required by Condition S.6.D, above.

S7. SOLID WASTES

A. Solid Waste Handling

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

B. Leachate

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

S8. ACUTE TOXICITY

A. Testing When There Is No Permit Limit for Acute Toxicity

The Permittee must:

1. Conduct acute toxicity testing on final effluent during June 2013 and December 2013.

2. Submit the results to Ecology with the permit renewal application. See Condition S.11 for renewal application submittal date.

3. Conduct acute toxicity testing on a series of at least five concentrations of effluent, including 100% effluent, and a control.

4. Use each of the following species and protocols for each acute toxicity test:

Acute Toxicity Tests	Species	Method
Fathead minnow 96-hour static-renewal test	*Pimephales promelas*	EPA-821-R-02-012
Daphnid 48-hour static test	*Ceriodaphnia dubia*, *Daphnia pulex*, or *Daphnia magna*	EPA-821-R-02-012

B. Sampling and Reporting Requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Department of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.

2. The Permittee must collect 24-hour composite effluent samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.

3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Department of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Subsection A and the Department of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.

5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Subsection A or pristine natural water of sufficient quality for good control performance.

6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.

7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the acute critical effluent concentration (ACEC). The ACEC equals 2.7% effluent.

8. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

9. Reports of individual characterization or compliance test results must be submitted to Ecology within sixty (60) days after each sample date.

S9. CHRONIC TOXICITY

A. Testing When There Is No Permit Limit for Chronic Toxicity

The Permittee must:

1. Conduct chronic toxicity testing on final effluent during August 2013 and February 2014.

2. Submit the results to Ecology with the permit renewal application. See Condition S.11 for renewal application submittal date.

3. Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the acute critical effluent concentration (ACEC) and the chronic critical effluent concentration (CCEC). The ACEC equals 2.7% effluent and the CCEC equals 0.7% effluent.

4. Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.

5. Perform chronic toxicity tests with all of the following species and the most recent version of the following protocols:

Saltwater Chronic Test	Species	Method
Topsmelt survival and growth	*Atherinops affinis*	EPA/600/R-95/136
Mysid shrimp survival and growth	*Mysidopsis bahia/ Americamysis bahia*	EPA-821-R-02-014

B. Sampling and Reporting Requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Department of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.

2. The Permittee must collect 24-hour composite effluent samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.

3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Department of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Subsection A and the Department of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.

5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Subsection A or pristine natural water of sufficient quality for good control performance.

6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.

7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the CCEC and the ACEC. The CCEC and the ACEC may either substitute for the effluent concentrations that are closest to them in the dilution series or be extra effluent concentrations. The CCEC equals 0.7% effluent. The ACEC equals 2.7% effluent.

8. All whole effluent toxicity tests that involve hypothesis testing must comply with the chronic statistical power standard of 39% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

9. Reports of individual characterization or compliance test results must be submitted to Ecology within sixty (60) days after each sample date.

S10. APPLICATION FOR PERMIT RENEWAL

The Permittee must submit an application for renewal of this permit by April 1, 2014.

GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

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

1. In the case of corporations, by a responsible corporate officer.

   For the purpose of this section, a responsible corporate officer means:

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

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

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

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

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

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

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

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

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

C. Changes to authorization. If an authorization under paragraph 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 Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

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

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

G2. RIGHT OF INSPECTION AND ENTRY

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

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

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

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

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

G3. PERMIT ACTIONS

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

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

1. Violation of any permit term or condition.

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

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

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

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

6. Nonpayment of fees assessed pursuant to RCW 90.48.465.

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

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

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

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

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

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

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

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

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

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

1. When cause exists for termination for reasons listed in A1 through A7 of this section, and Ecology determines that modification or revocation and reissuance is appropriate.

2. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition 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 PLANNED CHANGES

The Permittee must, as soon as possible, but no later than sixty (60) days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:
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, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. PLAN REVIEW REQUIRED

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

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit must be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. TRANSFER OF THIS PERMIT

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

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 Ecology at least thirty (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. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. REDUCED PRODUCTION FOR COMPLIANCE

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

G9. REMOVED SUBSTANCES

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

G10. DUTY TO PROVIDE INFORMATION

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

G11. OTHER REQUIREMENTS OF 40 CFR

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

G12. ADDITIONAL MONITORING

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

G13. PAYMENT OF FEES

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

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof must be punished by a fine of up to ten thousand dollars ($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 will incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. UPSET

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

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

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
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 S4.C of this permit.

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

G16. PROPERTY RIGHTS

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

G17. DUTY TO COMPLY

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

G18. TOXIC POLLUTANTS

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

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit must, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two (2) 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 must be a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both.

G20. COMPLIANCE SCHEDULES

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

G21. CONTRACT REVIEW

The Permittee must submit to Ecology any proposed contract for the operation of any wastewater treatment facility covered by this permit. The review is to ensure consistency with Chapters 90.46 and 90.48 RCW. In the event that Ecology does not comment within a thirty (30)-day period, the Permittee may assume consistency and proceed with the contract.

APPENDIX A

EFFLUENT CHARACTERIZATION FOR POLLUTANTS
THIS LIST INCLUDES EPA-REQUIRED POLLUTANTS (PRIORITY POLLUTANTS) AND SOME ECOLOGY PRIORITY TOXIC CHEMICALS (PBTs)

The following table, with analytical levels, is to be used as guidance for effluent characterization in NPDES permit applications and applications for permit renewal. The permit applications will specify the groups of compounds to be analyzed. Ecology may require additional groups to be analyzed. The table should also be used as a guide for routine effluent monitoring for pollutants specified in the permit. The objectives are to reduce the number of analytical "non-detects" in applications and monitoring reports and to measure effluent concentrations near or below criteria values where possible at a reasonable cost. If an applicant or Permittee knows that an alternate, less sensitive method (higher DL and QL) from 40 CFR Part 136 is sufficient to produce measurable results in their effluent, that method may be used for analysis.

EPA 307(A) REF. #	Pollutant & CAS No. *(if available)*	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL)[2] *µg/L unless specified*	Lowest Criteria Values *µg/L unless specified*
	Conventionals				
	Biochemical Oxygen Demand	SM5210-B		2 mg/L	
	Chemical Oxygen Demand	SM5220-D		10 mg/L	
	Total Organic Carbon	SM5310-B/C/D		1 mg/L	
	Total Suspended Solids	SM2540-D		5 mg/L	
	Total Ammonia (as N)	SM4500-NH3- GH		0.3 mg/L	
	Flow	Calibrated device			
	Dissolved oxygen	4500-OC/OG		0.2 mg/L	
	Temperature (max. 7-day avg.)	Analog recorder or use micro-recording devices known as thermistors		0.2º C	
	pH	SM4500-H^+ B	N/A	N/A	
	Nonconventionals				
	Total Alkalinity	SM2320-B		5 mg/L as CaCo3	
	Bromide (24959-67-9)	4110 B	100	400	
	Chlorine, Total Residual	4500 Cl G		50.0	7.5
	Color	SM2120 B/C/E		10 color unit	
	Fecal Coliform	SM 9221E	N/A	N/A	
	Fluoride (16984-48-8)	SM4500-F E	25	100	
	Nitrate-Nitrite (as N)	4500-NO3-E/F/H		100	10,000
	Nitrogen, Total Kjeldahl (as N)	4500-NH3-C/E/FG		300	
	Ortho-Phosphate (PO_4 as P)	4500- PE/PF	30	100	
	Phosphorus, Total (as P)	4500-PE/PF	30	100	
	Oil and Grease (HEM)	1664A		5,000	
	Radioactivity	Table 1E			
	Salinity	SM2520-B		3 PSS	
	Settleable Solids	SM2540 -F		100	
	Sulfate (as mg/L SO_4)	SM4110-B		200	
	Sulfide (as mg/L S)	4500-S^2F/D/E/G		200	2.0
	Sulfite (as mg/L SO_3)	SM4500-SO3B		2000	

EPA 307(A) REF. #	Pollutant & CAS No. *(if available)*	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL)[2] *µg/L unless specified*	Lowest Criteria Values *µg/L unless specified*
	Surfactants	SM5540 C		50	
	Total dissolved solids	SM2540 C		20 mg/L	500 mg/L[12]
	Total Hardness	2340B		200 as CaCO3	
	Aluminum, Total (7429-90-5)	200.8	2.0	10	750
	Barium Total (7440-39-3)	200.8	0.5	2.0	
	Boron Total (7440-42-8)	200.8	2.0	10.0	
	Cobalt, Total (7440-48-4)	200.8	0.05	0.25	
	Iron, Total (7439-89-6)	200.8	12.5	50	300
	Magnesium, Total (7439-95-4)	200.8	10	50	
	Molybdenum, Total (7439-98-7)	200.8	0.1	0.5	
	Manganese, Total (7439-96-5)	200.8	0.1	0.5	50
	Tin, Total (7440-31-5)	200.8	0.3	1.5	
	Titanium, Total (7440-32-6)	200.8	0.5	2.5	
Metals, Cyanide & Total Phenols					
114	Antimony, Total (7440-36-0)	200.8	0.3	1.0	14[5]
115	Arsenic, Total (7440-38-2)	200.8	0.1	0.5	36[7]
117	Beryllium, Total (7440-41-7)	200.8	0.1	0.5	4[8]
118	Cadmium, Total (7440-43-9)	200.8	0.05	0.25	0.37[3]
	Chromium (hex) dissolved (185-402-99)	SM3500-Cr EC	0.3	1.2	10[7]
119	Chromium, Total (7440-47-3)	200.8	0.2	1.0	57.2[3]
120	Copper, Total (7440-50-8)	200.8	0.4	2.0	3.1[3]
122	Lead, Total (7439-92-1)	200.8	0.1	0.5	0.54[3]
123	Mercury, Total (7439-97-6)	1631E	0.0002	0.0005	0.012[7]
124	Nickel, Total (7440-02-0)	200.8	0.1	0.5	8.2[3]
125	Selenium, Total (7782-49-2)	200.8	1.0	1.0	5[7]
126	Silver, Total (7440-22-4)	200.8	0.04	0.2	0.32[3]
127	Thallium, Total (7440-28-0)	200.8	0.09	0.36	1.7[5]
128	Zinc, Total (7440-66-6)	200.8	0.5	2.5	32.3[3]
121	Cyanide, Total (7440-66-6)	335.4	5	10	1.0[7]
	Cyanide, Available	SM4500-CN G	5	10	
065	Phenols, Total	EPA 420.1		50	21000[5]
Dioxin					
129	2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (176-40-16)	1613B	1.3 pg/L	5 pg/L	0.000000013[5]
Volatile Compounds					
002	Acrolein (107-02-8)	624	5	10	320/780[5]
003	Acrylonitrile (107-13-1)	624	1.0	2.0	0.059/0.66[5]
004	Benzene (71-43-2)	624	1.0	2.0	5.0[8]
018	Bis(2-Chloroethyl)ether (111-44-4)	611/625	1.0	2.0	0.031[5]
042	Bis(2-Chloroisopropyl) ether (108-60-1)	611/625	1.0	2.0	1400[5]
047	Bromoform (75-25-2)	624	1.0	2.0	4.3[5]
006	Carbon tetrachloride (108-90-7)	624/601 or SM6230B	1.0	2.0	0.25[5]
007	Chlorobenzene (108-90-7)	624	1.0	2.0	680[5]
016	Chloroethane (75-00-3)	624/601	1.0	2.0	

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019	2-Chloroethylvinyl Ether (110-75-8)	624	1.0	2.0	3540[10]
023	Chloroform (67-66-3)	624 or SM6210B	1.0	2.0	5.7[5]
051	Dibromochloromethane (124-48-1)	624	1.0	2.0	0.41[5]
025	1,2-Dichlorobenzene (95-50-1)	624	1.9	7.6	2700[5]
026	1,3-Dichlorobenzene (541-73-1)	624	1.9	7.6	400[5]
027	1,4-Dichlorobenzene (106-46-7)	624	4.4	17.6	400[5]
028	3,3'-Dichlorobenzidine (91-94-1)	605/625	0.5	1.0	
048	Dichlorobromomethane (75-27-4)	624	1.0	2.0	0.27[5]
013	1,1-Dichloroethane (75-34-3)	624	1.0	2.0	
010	1,2-Dichloroethane (107-06-2)	624	1.0	2.0	0.38[5]
029	1,1-Dichloroethylene (75-35-4)	624	1.0	2.0	0.057[5]
032	1,2-Dichloropropane (78-87-5)	624	1.0	2.0	3[11]
033	1,3-dichloropropylene (mixed isomers) (542-75-6)	624	1.0	2.0	10[5]
038	Ethylbenzene (100-41-4)	624	1.0	2.0	3100[5]
046	Methyl bromide (74-83-9) (Bromomethane)	624/601	5.0	10.0	48[5]
045	Methyl chloride (74-87-3) (Chloromethane)	624	1.0	2.0	270000[10]
044	Methylene chloride (75-09-2)	624	5.0	10.0	4.7[5]
015	1,1,2,2-Tetrachloroethane (79-34-5)	624	1.9	2.0	0.17[5]
085	Tetrachloroethylene (127-18-4)	624	1.0	2.0	0.80[5]
086	Toulene (108-88-3)	624	1.0	2.0	6800[5]
030	1,2-Trans-Dichloroethylene (156-60-5) (Ethylene dichloride)	624	1.0	2.0	700[4]
011	1,1,1-Trichloroethane (71-55-6)	624	1.0	2.0	200[8]
014	1,1,2-Trichloroethane (79-00-5)	624	1.0	2.0	0.6[5]
087	Trichloroethylene (79-01-6)	624	1.0	2.0	2.7[5]
088	Vinyl chloride (75-01-4)	624/SM6200B	1.0	2.0	2[5]
	Acid Compounds				
024	2-Chlorophenol (95-57-8)	625	1.0	2.0	81[4]
031	2,4-Dichlorophenol (120-83-2)	625	0.5	1.0	93[5]
034	2,4-Dimethylphenol (105-67-9)	625	0.5	1.0	380[4]
060	4,6-dinitro-o-cresol (534-52-1) (2-methyl-4,6,-dinitrophenol)	625/1625B	1.0	2.0	13.4[5]
059	2,4 dinitrophenol (51-28-5)	625	1.0	2.0	70[5]
057	2-Nitrophenol (88-75-5)	625	0.5	1.0	450[13]
058	4-nitrophenol (100-02-7)	625	0.5	1.0	600[13]
022	Parachlorometa cresol (59-50-7) (4-chloro-3-methylphenol)	625	1.0	2.0	-
064	Pentachlorophenol (87-86-5)	625	0.5	1.0[10]	0.28[5]
065	Phenol (108-95-2)	625	2.0	4.0	21000[5]
021	2,4,6-Trichlorophenol (88-06-2)	625	2.0	4.0	2.1[5]
	Base/Neutral Compounds				
001	Acenaphthene (83-32-9)	625	0.2	0.4	670[6]
077	Acenaphtylene (208-96-8)	625	0.3	0.6	132000[9]

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078	Anthracene (120-12-7)	625	0.3	0.6	9600[5]
005	Benzidine (92-87-5)	625	12	24	0.00012[5]
067	Benzyl butyl phthalate (85-68-7)	625	0.3	0.6	1500
072	Benzo(*a*)anthracene (56-55-3)	625	0.3	0.6	0.0028[5]
PBT	Benzo(j)fluoranthene (205-82-3)	625	0.5	1.0	-
PBT	Benzo(r,s,t)pentaphene (189-55-9)	625	0.5	1.0	
073	Benzo(*a*)pyrene (50-32-8)	610/625	0.5	1.0	0.0028/0.031[5]
074	3,4-benzofluoranthene (Benzo(b)fluoranthene) (205-99-2)	610/625	0.8	1.6	
075	11,12-benzofluoranthene (Benzo(k)fluoranthene) (207-08-9)	610/625	0.8	1.6	0.0028/0.031[5]
079	Benzo(*ghi*)Perylene (191-24-2)	610/625	0.5	1.0	0.1[9]
043	Bis(*2-chloroethoxy)*methane (111-91-1)	625	5.3	21.2	92000[9]
018	Bis(*2-chloroethyl*)ether (111-44-4)	611/625	0.3	1.0	0.031[5]
042	Bis(*2-chloroisopropyl*)ether (108-60-1)	625	0.3	0.6	1400[5]
066	Bis(*2-ethylhexyl*)phthalate (117-81-7)	625	0.1	0.5	1.8[5]
070	Butyl benzyl phthalate (117-81-7)	625	0.25	0.6	1500
041	4-Bromophenyl phenyl ether (101-55-3)	625	0.2	0.4	180[10]
020	2-Chloronaphthalene (91-58-7)	625	0.3	0.6	1000[6]
040	4-Chlorophenyl phenyl ether (7005-72-3)	625	0.3	0.5	365[9]
076	Chrysene (218-01-9)	610/625	0.3	0.6	0.0028[5]
PBT	Dibenzo (a,j)acridine (224-42-0)	610M/625M	2.5	10.0	-
PBT	Dibenzo (a,h)acridine (226-36-8)	610M/625M	2.5	10.0	-
082	Dibenzo(a-*h*)anthracene (53-70-3) (1,2,5,6-dibenzanthracene)	625	0.8	1.6	2700[5]
PBT	Dibenzo(a,e)pyrene (192-65-4)	610M/625M	2.5	10.0	-
PBT	Dibenzo(a,h)pyrene (189-64-0)	625M	2.5	10.0	
028	3,3'-Dichlorobenzidine (91-94-1)	605/625	0.5	1.0	0.04[5]
070	Diethyl phthalate (84-66-2)	625	1.9	7.6	23000[5]
071	Dimethyl phthalate (131-11-3)	625	1.6	6.4	313000[5]
068	Di-n-butyl phthalate (84-74-2)	625	0.5	1.0	2700[5]
035	2,4-dinitrotoluene (121-14-2)	609	0.2	0.4	0.11[5]
036	2,6-dinitrotoluene (606-20-2)	609/625	0.2	0.4	6250[13]
069	Di-n-octyl phthalate (117-84-0)	625	0.3	0.6	3.1[13]
037	1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)	1625B	5.0	20	0.04[5]
039	Fluoranthene (206-44-0)	625	0.3	0.6	300[5]
080	Fluorene (86-73-7)	625	0.3	0.6	1300[5]
009	Hexachlorobenzene (118-74-1)	612/625	0.3	0.6	0.00075[5]
052	Hexachlorobutadiene (87-68-3)	625	0.5	1.0	0.44[5]
053	Hexachlorocyclopentadiene (77-47-4)	1625B/625	0.5	1.0	240[5]
012	Hexachloroethane (67-72-1)	625	0.5	1.0	1.9[5]
083	Indeno(*1,2,3-cd*)Pyrene (193-39-5)	610/625	0.5	1.0	0.0028[6]
054	Isophorone (78-59-1)	625	0.5	1.0	8.4[5]

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PBT	3-Methyl cholanthrene (56-49-5)	625	2.0	8.0	_
055	Naphthalene (91-20-3)	625	0.3	0.6	400[11]
056	Nitrobenzene (98-95-3)	625	0.5	1.0	17[5]
061	N-Nitrosodimethylamine (62-75-9)	607/625	2.0	4.0	0.00069[5]
063	N-Nitrosodi-n-propylamine (621-64-7)	607/625	0.5	1.0	0.005[5]
062	N-Nitrosodiphenylamine (86-30-6)	625	0.5	1.0	5[5]
PBT	Perylene (198-55-0)	625	1.9	7.6	
081	Phenanthrene (85-01-8)	625	0.3	0.6	4[11]
084	Pyrene (129-00-0)	625	0.3	0.6	960[5]
008	1,2,4-Trichlorobenzene (120-82-1)	625	0.3	0.6	35[6]
		Pesticides/PCBs			
089	Aldrin (309-00-2)	608	0.025	0.05	0.00013[5]
102	alpha-BHC (319-84-6)	608	0.025	0.05	0.0039[5]
103	beta-BHC (319-85-7)	608	0.025	0.05	0.014[5]
104	gamma-BHC (58-89-9)	608	0.025	0.05	0.019[5]
105	delta-BHC (319-86-8)	608	0.025	0.05	7.0[13]
091	Chlordane (57-74-9)	608	0.025	0.05	0.00057[5]
092	4,4'-DDT (50-29-3)	608	0.025	0.05	0.00059[5]
093	4,4'-DDE (72-55-9)	608	0.025	0.05[10]	0.00059[5]
094	4,4' DDD (72-54-8)	608	0.025	0.05	0.00083[5]
090	Dieldrin (60-57-1)	608	0.025	0.05	0.00014[5]
095	alpha-Endosulfan (959-98-8)	608	0.025	0.05	0.0087[5]
096	beta-Endosulfan (33213-65-9)	608	0.025	0.05	0.0087[5]
097	Endosulfan Sulfate (1031-07-8)	608	0.025	0.05	0.093[5]
098	Endrin (72-20-8)	608	0.025	0.05	0.0023[5]
099	Endrin Aldehyde (7421-93-4)	608	0.025	0.05	0.76[5]
100	Heptachlor (76-44-8)	608	0.025	0.05	0.00021[5]
101	Heptachlor Epoxide (1024-57-3)	608	0.025	0.05	0.00010[5]
106	PCB-1242 (53469-21-9)	608	0.25	0.5	0.000170[5]
107	PCB-1254 (11097-69-1)	608	0.25	0.5	0.000170[5]
108	PCB-1221 (11104-28-2)	608	0.25	0.5	0.000170[5]
109	PCB-1232 (11141-16-5)	608	0.25	0.5	0.000170[5]
110	PCB-1248 (12672-29-6)	608	0.025	0.5	0.000170[5]
111	PCB-1260 (11096-82-5)	608	0.13	0.5	10.5[13]
112	PCB-1016 (12674-11-2)	608	0.13	0.5	0.42[13]
113	Toxaphene (8001-35-2)	608	0.24	0.5	0.00073[5]

PBT - Denotes a state of Washington priority pollutant.

1. Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR Part 136, Appendix B.
2. Quantitation Level (QL) is equivalent to EPA's Minimum Level (ML) which is defined in 40 CFR Part 136 as the minimum level at which the entire GC/MS system must give recognizable mass spectra (background corrected) and acceptable calibration points. These levels were published as proposed in the Federal Register on March 28, 1997.

3. This criterion is dependent upon receiving water characteristics. This value is the aquatic life chronic value at a hardness of 25 mg/l.
4. EPA 822-R-03-031.
5. Human health criteria as fresh or marine – EPA National Toxic Rule.
6. Fresh water aquatic life as Acute or Chronic – EPA recommended values.
7. Aquatic life as Acute or Chronic – WAC 173-201A.
8. USEPA Drinking Water Criteria.
9. No human health-based screening levels were available for 2-chloroethylvinyl ether. This value is the surface water screening values derived by U.S. EPA Region 4 Water Management Division. These values were obtained from Water Quality Criteria documents and represent the chronic ambient water quality criteria values for the protection of aquatic life.
10. USGS 2004–5194. Pesticides Detected in Urban Streams in King County, Washington, 1998–2003.
11. Estimated effect level.
12. Chapter WAC 173–200.
13. Estimated effect level.