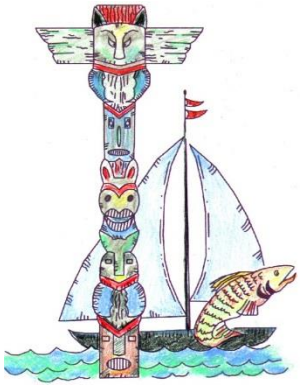
CITY OF KALAMA

COWLITZ COUNTY **WASHINGTON**



DRAFT STORMWATER UTILITY FORMATION STUDY

G&O #18223
OCTOBER 2018

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CITY OF KALAMA

COWLITZ COUNTY **WASHINGTON**

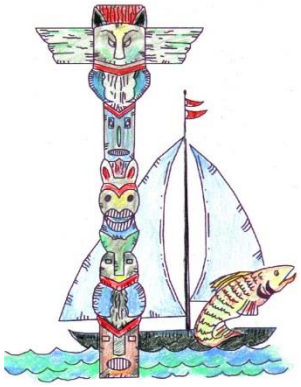


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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

CHAPTER 1

INTRODUCTION

The City of Kalama is interested in taking a long-term approach to stormwater management and preventive maintenance of its facilities. Due to the topography and geology of the City and the surrounding area, high volumes of runoff often result from typical storm events, which has caused flooding or property damage in some cases. The City is also concerned about the potential for adverse effects on the environment due to pollutants found in urban stormwater runoff. As development increases throughout the City and more impervious land cover replaces grassed or forested areas, runoff volumes and pollutant loads are likely to increase. A stormwater management program will allow the City to provide and maintain a system of stormwater facilities and controls designed to protect the property and wellbeing of the City's residents and to preserve and enhance the environment.

One method of generating revenue is through a user-fee-funded stormwater management utility. A stormwater management utility provides stable and adequate revenue and equitably distributes the cost of stormwater services and facilities. Unlike water and sewer utilities, the benefits of a stormwater management utility are often difficult for the average customer to immediately recognize. However, as stormwater management regulations become more stringent and conventional funding sources become limited, the service charge option is growing as a viable method of funding programs for stormwater management.

This study will discuss the formation of a stormwater management utility, methods of funding capital improvements, and a potential rate structure for the City of Kalama.

CHAPTER 2

STORMWATER MANAGEMENT UTILITY

Historically, general revenues from property taxes have financed stormwater management programs. Revenue from these types of taxes tends to be inadequate to fund necessary stormwater management services. Often, funds for stormwater management projects are diverted to other areas that garner more public support, such as law enforcement or public parks.

RCW Chapter 35.67 allows the City to form a stormwater management utility to provide for the planning, development, management, operation, maintenance, use, and improvements of the storm drainage system. A utility is an enterprise that is operated or regulated by a government entity. The enterprise funds are predominantly self-sustaining and account for the acquisition, operation, and maintenance of governmental facilities.

A stormwater management utility can be formed by adoption of an ordinance by the City Council. An example ordinance is provided in Appendix A. This ordinance would create a stormwater management utility and the associated enterprise fund. Appendix B contains an example stormwater management utility rate ordinance defining the service charges that could be adopted by the City Council.

Within southwest Washington, the following entities have also developed stormwater utilities: Clark County, Vancouver, Ridgefield, Washougal, Battle Ground, Castle Rock, Longview, Kelso, Cowlitz County, and Camas. Most stormwater management utilities have followed a developmental path similar to that of government-operated water and wastewater utilities. Legal, procedural, and conceptual guidelines for proper rate setting for water and wastewater utilities have set a precedent for stormwater management utilities to follow.

The following guidelines are important to follow when considering any utility rate structure:

- A utility rate should be legal and enforceable.
- A utility rate should be perceived as equitable by the public in order to gain widespread acceptance.
- A billing system should require a relatively small portion of the total utility revenues and the cost of implementing the billing system should be reasonable.
- A rate structure should reflect the long-term needs and goals of the utility.

The service charge is a fee levied by the City upon all developed property within the City's boundary. These charges may provide revenue for the stormwater operation and maintenance expenditures, depreciation of existing facilities, and existing customer's share of capital improvements. The connection charge, or System Development Charge (SDC), is typically based on the value of the existing system and includes the future customer's share of the existing storm drainage system. Connection charges can only be used to fund major capital improvements.

SERVICE CHARGE

Various methods or combinations of methods have been used to determine stormwater management utility service charges. Most stormwater management utility fees are based on the impervious cover on a parcel of land. This is because the amount of impervious cover is directly proportional to the volume of stormwater runoff produced by a given area.

The approach taken by many utilities bases the rate structure on the average amount of impervious cover on a single-family residential parcel or equivalent residential unit (ERU). All single-family residences are charged the same rate and charges to other types of customers are in relation to the ERU. For this study, the impervious cover on a parcel was determined through aerial photographs.

Some utilities use total property area, a more basic parameter, as the ERU basis for determining rates because this information is often more readily available than total impervious cover.

Other utilities use directly connected impervious area (DCIA), such as roof drains that connect to a gutter instead of splash blocks on a lawn, as the rate structure basis. This methodology of determining an ERU would be more complex and costly to determine.

Many utilities offer credits, mostly to nonresidential customers, for stormwater management activities that meet or exceed the minimum development standards. The credits help to increase public support of the stormwater management utility and provide incentive to properly maintain on-site stormwater management facilities.

SYSTEM DEVELOPMENT CHARGE

SDCs provide a mechanism by which owners of property that is developed in the future share in the current cost of constructing drainage and water quality improvements. These types of improvements are typically designed for 20 or more years. These charges are implemented to ensure that developing properties share appropriately in capital improvements built prior to their development. SDCs are most appropriate when applied to drainage facilities that serve regional areas that must be built with substantial excess capacity in anticipation of the increased runoff generated by future development.

SDCs can be structured such that new customers are required to pay an amount equivalent to that paid by existing customers toward invested capital funds. This "buy-in" SDC is calculated based on net system worth divided by the number of existing customers, or ERUs.

An incremental pricing method could be used in place of the "buy-in" SDC. In areas of rapid growth, this method seeks to place the burden of growth on new customers. New customers may pay for the cost of construction of future and existing facilities as they connect to the system. The goal of the incremental cost pricing method is to minimize the portion of future service rate increases due to growth by an up-front charge for existing and/or new capacity.

The SDC can be an effective means of keeping the stormwater system up to date to meet current demands in areas of rapid growth.

PLAN REVIEW AND INSPECTION FEES

Fees for plan review and inspection are intended to ensure compliance with comprehensive stormwater management plans and construction standards established by the City. These fees are not primarily designed to collect revenue but as a means to cover costs associated with plan review and inspection. Many cities charge a flat fee for each plan review or inspection for residential connections and another rate for commercial development.

CHAPTER 3

METHODS OF FUNDING

The capital resources, other than service charges and SDCs, available to a city to construct stormwater improvements include grant and loan funds, debt financing, and improvement districts. Most of these resources support capital improvements such as storm sewer construction. The various methods of capital improvement funding are described below.

GRANT AND LOAN FUNDS

There are several grant and loan funds available for capital improvements. Among these are the Public Works Trust Fund (PWTF) and the Washington State Department of Ecology Water Quality Combined Funding Program, which includes several different funding programs. In addition, the Department of Ecology Flood Control Assistance Account Program (FCAAP) can be utilized to construct flood control projects. The Aquatic Lands Enhancement Account (ALEA) provides grants for preservation or improvement of wetlands, natural systems, waterfront redevelopment, plus some aquatic land-related planning. Other potential funding sources include the Community Development Block Grant (CDBG), the Rural Community Assistance Corporation (RCAC), and the USDA Rural Development, Water and Waste Disposal Loan and Grant Program. Grant funding is limited; therefore, loans are the more likely source for outside funding.

PUBLIC WORKS TRUST FUND

The PWTF is a revolving loan fund designed to help local governments finance needed public works projects through low-interest loans and technical assistance. The PWTF, established in 1985 by legislative action, offers loans substantially below market rates, payable over periods ranging up to 20 years. The Public Works Trust Fund program also provides low-interest loans to fund preconstruction activities that prepare a specific project for construction. Funding is subject to state legislature appropriation and is not guaranteed to be available every year.

PWTF has four loan programs: Construction, Preconstruction, Planning, and Emergency. The Construction Program accepts applications once per year in the spring, and the money becomes available approximately one year later. The Preconstruction and Planning Programs are open every other month and must be submitted to the Public Works Board prior the 15th of the month to be reviewed at the next Board meeting. These funds become available shortly after the Public Works Board makes its final decision as to the award. Emergency projects must have a locally declared emergency and are applied for on an open cycle depending on the availability of funds. Project expenditures are reimbursable from the date of the declared emergency.

An applicant must have a long-term plan for financing their public works needs. If the applicant is a county or city, it must adopt the 1/4 percent real estate excise tax that is dedicated to public works construction projects. Eligible public works projects include streets and roads, bridges, storm sewers, sanitary sewer collection and treatment systems, and domestic water. Loans are presently offered only for purposes of repair, replacement, rehabilitation, reconstruction, or improvement of existing eligible public works systems. Eligible project costs can include expenses related to serving 20-year forecasted growth as identified in a growth management comprehensive plan.

Since substantially more trust fund dollars are requested than are available, local jurisdictions must compete for the available funds. The applications are carefully evaluated, and the Public Works Board submits a prioritized list of those projects to the legislature that are recommended to receive low-interest financing. The legislature reviews the list and indicates its approval through the passage of an appropriation from the Public Works Assistance Account to cover the cost of the proposed loans. Once the governor has signed the appropriation bill into law (an action that usually occurs by the following April), those local governments recommended to receive loans are offered a formal loan agreement with appropriate interest rates and terms as determined by the Public Works Board.

The PWTF has not been funded for the past several years and is not accepting applications for construction projects at this time. The fund is currently accepting Emergency Loan Fund and Preconstruction Loan Fund applications only. As funding becomes available, construction projects that previously applied and were approved will be given priority. The Public Works Board may be accepting applications for construction funding during the spring of 2019.

DEPARTMENT OF ECOLOGY WATER QUALITY COMBINED FUNDING PROGRAM

The Department of Ecology administers several loan and grant programs that can be used to fund the following:

- Stormwater Capital Improvements including Stormwater System Retrofits
- Low-Impact Development Projects
- Inventories of Stormwater Sources
- Public Education and Communication
- Review and Preparation of Stormwater Regulations
- Mapping
- Source Control Activities
- Establishing and Refining Stormwater Utilities

A common application is available for funding from the Ecology-administered programs. The programs are competitive and the majority of the funding available is in the form of low-interest loans.

Stormwater Financial Assistance Program

The Stormwater Financial Assistance Program (SFAP) is administered by Ecology to provide funding for design and/or construction of stormwater facility retrofits. Construction of facilities for new development or redevelopment is not eligible, though grant funds may pay for the portion of a facility that treats runoff from existing surfaces. Stormwater source control activity projects are also eligible if they provide water quality benefits for 3 years beyond the grant period. The maximum total grant award is $5.0 million per funding cycle per city. Required matching for nonpoint source activity projects is 25 percent or 15 percent for hardship-eligible communities (population below 25,000 and median household income below 80 percent of state median household income).

Centennial Clean Water Fund

The Centennial Clean Water Fund (CCWF) is state funded and provides loans and grants for projects that enhance water quality. Eligible stormwater projects include water quality treatment facilities and projects or facilities that address nonpoint pollution problems. Projects that only address flood control or wetlands purchases are not eligible under the CCWF. Under the CCWF grant program, water quality facilities construction projects may receive 50 to 100 percent of the eligible cost as lower interest rates (1.3 to 0 percent); however, grant funding is only available to those who can document hardship. Hardship is demonstrated if the residential population in the service area is less than 25,000 and the median household income of the service area is less than 80 percent of the state median household income.

The design and construction of water quality facilities are also eligible for 100 percent loans through CCWF. Recent loan terms have been 1.0 percent interest rate for repayment schedules from 1 to 5 years and 2.0 percent for repayment schedules between 5 and 20 years. The CCWF is a competitive program. Applications are scored according to a rating system that includes such factors as seriousness of the water quality problem, public health impacts, and beneficial impact of the project on water quality.

Section 319 Funding

The Section 319 Funding Program is administered by the EPA and by the Department of Ecology. Funding is available for watershed planning, implementation of stormwater best management practices (BMPs), water quality monitoring, and outreach efforts. Grant recipients that implement BMPs are required to report water quality monitoring data to Ecology annually. Projects may be awarded up to $500,000, and matching requirements differ by project type and the amount awarded. Required matching for

nonpoint source activity projects is 25 percent or 15 percent for hardship-eligible communities (population below 25,000 and median household income below 80 percent of state median household income).

Water Pollution Control State Revolving Fund

The State Revolving Fund (SRF) Program is state-funded and provides loans for stormwater pollution control-related projects. The federal government provides annual funding through EPA to support the SRF Program, which requires State Environmental Review Process (SERP) documentation, similar to National Environmental Policy Act (NEPA) review. Projects that are eligible for funding under this program must have a component that contributes to the improvement of water quality; flood control projects are not eligible. Loan terms vary annually depending on the payback period. Recent loan terms are 2.0 percent interest on loans with 20-year payback periods, and 1.0 percent interest on loans paid back in 5 years. Loans can cover 100 percent of the project cost.

FLOOD CONTROL ASSISTANCE ACCOUNT PROGRAM

The FCAAP was established by the State of Washington in 1984 to assist local jurisdictions with comprehensive flood planning and maintenance efforts to reduce flood damage. The program is administered through the Department of Ecology in association with the Department of Fish and Wildlife and County engineers. Funding for the program is approximately $4.0 million each biennium, with a $500,000 cap for each award. Operations, maintenance, and capital improvement projects are all eligible for grant assistance as long as the public entity has a certified comprehensive flood control management plan in place. The FCAAP is generally written through the county. This means that all projects within the county are ranked and compete for the portion of the total FCAAP funds available to the county. However, due to state budget reductions, Ecology will not be offering FCAAP grants through fiscal year 2019.

AQUATIC LANDS ENHANCEMENT ACCOUNT

The ALEA was established in 1994 to provide grants to cities, towns, counties, and port districts for preservation or improvement of wetlands, natural systems, waterfront redevelopment, plus some aquatic land-related planning. The program is administered by the State Recreation and Conservation Office and is funded primarily by revenue generated by the State Department of Natural Resources' management of state-owned aquatic lands. The maximum grants are $1,000,000 for acquisitions projects and $500,000 for restoration, improvement, or development projects. The project must be associated with state-owned aquatic lands. Applicants must provide a minimum 50 percent match for each project. A storm project that redirects or treats runoff and thus improves state-owned aquatic lands would be an eligible project under this program.

RURAL COMMUNITY ASSISTANCE CORPORATION

The RCAC provides financing for water, wastewater, and stormwater planning and environmental work to rural communities with populations below 50,000 people throughout the western U.S. Stormwater projects that incorporate low-impact development techniques may qualify for priority in the loan application process. The RCAC issues loans for feasibility and predevelopment of infrastructure projects. Typically, up to $50,000 is available for feasibility loans and up to $350,000 is available for predevelopment loans with a 5 percent interest rate. These loans can be used as interim funding for USDA Rural Development funding.

COMMUNITY DEVELOPMENT BLOCK GRANT

The CDBG provides general-purpose grant financing for public infrastructure work to rural communities with populations below 50,000 people that are not participating in a CDBG entitlement urban county consortium. Acquisition, planning, design, and construction or renovation projects including stormwater infrastructure are eligible if the project will benefit primarily low- and moderate-income persons. The grant stipulates that 51 percent of the project must benefit low- to moderate-income persons. Typically, up to $750,000 is available for acquisition or construction projects and $24,000 is available for planning-only projects. Matching is not required, but is favored when considering applications.

USDA RURAL DEVELOPMENT, WATER AND WASTE DISPOSAL LOAN AND GRANT PROGRAM

The USDA provides funding and assistance for stormwater drainage improvements in rural areas and towns with populations below 10,000 people. The program provides long-term, low-interest rate loans. Interest rates are set quarterly. The program may also provide grants to loan recipients if funding is available and if a need is demonstrated. Predevelopment planning grants require a match of 25 percent, though construction grants do not require a match. Larger Rural Development-funded projects often require interim financing. RCAC and Evergreen Rural Water Association loans can be used for interim financing.

DEBT FINANCING

Two forms of debt financing are available for capital improvements including general obligation (G.O.) bonds and revenue bonds. General obligation bonds are backed by the "full faith and credit of the city" and are paid for through property tax levies. These bonds require voter approval before they can be implemented. A less common means of financing capital improvements associated with stormwater projects is through the use of revenue bonds. The City, like other municipalities, is capable of issuing tax-exempt bonds. The principal and interest of such bonds are repaid from revenue generated from a water, sewer, or stormwater utility. This type of funding may be offered without voter

approval. However, in order to qualify to sell revenue bonds, the City must establish that its net operating income (gross income less expenses) is equal to or greater than its debt coverage factor (typically 1.3 to 1.4 times the annual principal and interest due for all outstanding bonded indebtedness). Essentially, utility rates have to be set high enough to ensure revenue bond repayment.

DEVELOPER FEES

The City may require improvements for service to a property within new plats or commercial improvements to be financed by the developer. The developer, for example, is usually required to construct detention facilities in accordance with city standards or pay into a fund for construction of an off-site facility to serve multiple properties. The alternative approach allows the City to develop facilities in a planned and cost-effective manner. However, several developments are generally required before the City has available funds to construct a regional facility. The City has little control over the scheduling of such facilities unless alternative funding sources, such as service charge revenues, are utilized on a short-term basis to fund initial construction and are then repaid as developer fees are collected.

IMPROVEMENT DISTRICTS AND SPECIAL ASSESSMENTS

Levying of special assessments on benefited properties has been used throughout the state for stormwater improvements. Projects funded through special assessments must have an identifiable benefit to the properties included in the assessment area, and charges for each parcel must be consistent with the relative benefit to each property. In Washington, municipalities can establish a local improvement district (LID) or utility local improvement district (ULID). These approaches require an assessment against benefited property owners within the district boundaries. Any LID may be initiated upon a petition signed by the owners of property aggregating a majority (50 percent) of the area within the proposed district. An LID initiated by resolution would be divested by a protest signed by the owners of a property within the district and filed with the city council within 10 days from the date of passage of the ordinance ordering the improvement if the property within the district is subject to 60 percent or more of the total cost of the improvement.

The use of LIDs to fund stormwater projects is complicated by the difficulty in quantifying benefits for individual property owners. For water and sewer improvements, for example, the benefits are generally easy to identify. With drainage improvements, however, upstream or hillside properties, which could contribute significantly to runoff, may actually benefit little from improvements because of their protected location. One result may be too narrowly establishing the boundaries of the LID, which may be counterproductive to comprehensive stormwater management. Another problem with LIDs is that they place heavy administrative burdens on city staff to maintain the improvements in the district.

CHAPTER 4

RECOMMENDED CAPITAL IMPROVEMENTS

This section will discuss the stormwater capital improvements presently recommended for the City of Kalama. They were developed through review of the City's existing infrastructure and discussions with City staff. These improvements include the preparation of a Stormwater Comprehensive Plan. This section also includes a discussion of the operations and maintenance needs of the City's stormwater system.

Estimated project costs for each of these improvements are provided in Appendix C and Figure 4-1 includes the locations of each infrastructure improvement. The project cost includes estimated construction, administration, engineering, and legal costs. Table 4-1 outlines the improvements and estimated project costs. The total estimated cost of these capital improvements is $1,445,000. All costs in this chapter are presented in 2018 dollars.

Although the City of Kalama is not currently regulated under the National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Program, the minimum control measures that must be included in a Phase II stormwater program provide a framework for an effective stormwater management program. The Phase II rule covers "small" municipal separate stormwater sewer systems that:

- Own and Operate a Storm Drain System
- Discharge to Surface Water
- Are Located in Census-Defined Urbanized Areas
- Population greater than 1,000

As of the 2010 Census, the Longview-Kelso urbanized area extends to several miles north of the City of Kalama. When this area reaches Kalama, the Phase II rule will apply to the City. The regulations call for the development of the following stormwater management measures:

- Public Education and Outreach Program
- Public Participation/Involvement Program
- Illicit Discharge Detection and Elimination Program
- Erosion and Sediment Control Program for Construction
- New Development and Redevelopment Runoff Program
- Pollution Prevention (Good Housekeeping) Program
- Recordkeeping
- Recording

It is recommended that a Stormwater Comprehensive Plan be developed to assist the City with meeting the above requirements. The Stormwater Comprehensive Plan will provide a guide for developing and implementing a coordinated, efficient stormwater quality improvement plan. The plan will also provide a guide for improvements to address flood hazard management. The ultimate objective of the Stormwater Comprehensive Plan is to minimize stormwater quality impacts as well as protecting the health and welfare of the City's residents.

The Stormwater Comprehensive Plan has a total estimated project cost of $80,000. We recommend the City apply for a Centennial Fund grant for nonpoint activities and facilities to fund the preparation of the Stormwater Comprehensive Plan. Eligibility for grants is based on a rating system which includes such factors as seriousness of problem, public health impacts, and existing compliance orders.

INFRASTRUCTURE IMPROVEMENTS

1 EAST/WEST FRONTAGE ROAD STORM DRAIN CLEANING

The existing storm drain that flows south to north along East Frontage Road is in need of cleaning and may require replacement in some sections. City crews have investigated this system and have found extensive sedimentation, even after the line was cleaned several years prior. It is unclear whether any flow is conveyed through this pipe at all. This project would include cleaning the existing pipes and conducting a full television inspection of the drain to determine if there is structural damage. If damage is identified, the drain must be repaired as part of a separate project.

Additionally, the ditch between West Frontage Road and the railroad tracks north of Kingwood Street where the storm drain outfalls is proposed to be cleaned and graded where necessary in order to improve capacity. Work would include clearing the ditch of vegetation, grading the ditch to maintain positive drainage, stabilizing the outfall of the storm drain with quarry spalls, and re-establishing vegetation in disturbed areas. The ditch extends beyond City limits, and this project is intended to address only the portion of the ditch within the City's jurisdiction. If portions of the ditch outside of City limits cause drainage problems within the City, the City may need to coordinate with WSDOT in order to address maintenance concerns within the WSDOT right-of-way.

Estimated Project Cost: $115,000

2 SHIP'S WATCH DRAINAGE REDIRECTION TO SPENCER CREEK

Currently, runoff from the Ship's Watch development is eventually conveyed downslope to the south, to the conveyance system that flows through the downtown area. As the downtown system is overburdened during peak flows, the

CIP 1
CIP 2
CIP 3
CIP 4
CIP 5
CIP 6
N HENDRICKSON DR
S INTERSTATE 5 HWY
WILSON DR
NW 3RD ST
OAK ST
MEEKER DR
NECTARINE DR
HENDRICKSON DR
NW 2ND ST
E FRONTAGE RD
W FRONTAGE RD
N INTERSTATE 5 HWY
N EXIT 30 OFF RAMP
S EXIT 30 ON RAMP
W MARINE DR
COLUMBIA RIVER
CEMETERY RD
SPENCER CREEK RD
VIVIAN RD
GREAT NORTHERN RD
WATERS WATCH RD
HORIZON DR
HOLLY BLVD
N 15TH ST
TAYLOR RD
N 2ND PL
N 3RD PL
IVY ST
GERANIUM ST
N 1ST ST
N 2ND ST
N 3RD ST
N 4TH ST
N 5TH ST
E ELM ST
W ELM ST
S 1ST ST
S 2ND ST
S 3RD ST
CHINA GARDEN RD
SE DATE ST
MILITARY RD
S 1ST PL
S 2ND PL
S 3RD PL
S 6TH ST
S 7TH ST
S 10TH ST
S 11TH ST
CEDAR ST
BIRCH ST
GWYNNE RD
SUMMIT DR
WOODALE DR
ASHLAND ST
SILVERDUST DR
STEPPING STONE ST
STONE PARK
CLOVERDALE RD
OLD PACIFIC HWY S
CLIFF CT

Legend

- City Limits
- Major Water Bodies
- Storm Structures

Storm Facilities

- Detention Facility
- Treatment Facility

Storm Pipes

- <8-inch Diameter
- 8-inch Diameter
- 10-inch Diameter
- 12-inch Diameter
- 14-inch Diameter
- 15-inch Diameter
- 18-inch Diameter
- 21-inch Diameter
- 24-inch Diameter
- 30-inch Diameter
- 36-inch Diameter
- 48-inch Diameter
- Box Culvert
- Unknown Size
- Ditch
- Capital Improvements

N
W E
S

0 250 500 1,000 1,500 Feet

CITY OF KALAMA

FIGURE 4-1
STORMWATER UTILITY FORMATION
RECOMMENDED CIPS

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CONSULTING ENGINEERS

\\goSERVER3\DATA1\KALAMA\18223.00 Stormwater Utility Formation\GIS\CIP.mxd

City would prefer to direct runoff from the Ship's Watch development downslope to the north toward Spencer Creek. This project would include the installation of additional conveyance pipe, structures, and a stabilized outfall to the creek.

Estimated Project Cost: $199,000

3 SPENCER CREEK CULVERT REPLACEMENTS (SPENCER CREEK ROAD, NECTARINE DRIVE, AND MEEKER DRIVE)

The existing culverts that convey a seasonal channel across Spencer Creek Road, Nectarine Drive, and Meeker Drive are undersized for the peak tributary flows. Drainage through this channel often backs up upstream of the culverts, as they serve as choke points for the flow. There is risk of roadway flooding or potential property damage if these culverts are plugged or their capacity is otherwise reduced. This project should be conducted in conjunction with the Ship's Watch drainage redirection, as the runoff from the Ship's Watch development will be directed to the drainage channel that includes these culverts. The existing culverts are 12 or 24 inches in diameter, and they are proposed to be replaced with larger diameter pipe. Outfall stabilization at the outlet of each culvert will be provided, and some clearing and grading of the drainage channel in the vicinity of the culverts will be included in this work.

Estimated Project Cost: $216,000

4 JUNIPER STREET OUTFALL REHABILITATION

An existing outfall past the west end of Juniper Street, west of North 2nd Street, currently discharges at the top of a steep slope. A channel along the slope has been excised by the high flows through the outfall. This project would include the extension of the outfall pipe, along with anchoring and support, to convey flows to the bottom of the slope. A large-diameter structure would be installed at the bottom of the slope to provide sufficient energy dissipation, and the structure at the east side of North 1st Street would be replaced to connect the new pipe to the existing system. This project would also include stabilization, restoration, and revegetation of the slope, and filling of the existing energy dissipation basin.

Estimated Project Cost: $440,000

5 ASHLAND/SILVERDUST DITCH CAPACITY IMPROVEMENT

A drainage ditch that currently conveys flows through the Silverdust Drive and Graystone Road neighborhoods is undersized for the tributary flows. The ditch, which has overflowed in the past flooding nearby properties, is currently narrow and flat, with grassed sides, and is located on private properties within an easement. This project would improve capacity of the ditch by regrading and

armoring sections of the ditch where flow is impeded. If the existing 24-inch-diameter culverts are found to be blocked, the project will also include their cleaning. Culverts that are structurally impaired may be removed and replaced as a separate project.

Estimated Project Cost: $160,000

6 SOUTH 10TH STREET AND BIRCH STREET DITCH CAPACITY IMPROVEMENT

The existing drainage ditch near the intersection of South 10th Street and Birch Street is very flat and sometimes overtops during large storm events. This project would include grading and stabilization of the ditch to provide greater capacity. As the ditch width is limited by the properties on either side, the ditch will primarily be deepened and adequate side slopes will be maintained as much as possible. Where steeper side slopes are necessary, armoring will be installed to prevent excising of the ditch sides. This project would also include cleaning the 18-inch-diameter culvert at the intersection of 9th Street and Birch Street and replacing the 18-inch-diameter culvert that crosses South 10th Street with a larger diameter pipe to prevent a constriction within the upsized ditch.

Estimated Project Cost: $170,000

OPERATIONAL PROJECTS

7 STORMWATER COMPREHENSIVE PLAN

The City will develop a formal Stormwater Comprehensive Plan in order to fully document its existing drainage system, more extensively identify problem areas, and provide a long-term plan for management of runoff to guide future development. The plan will develop a long-range plan for construction of stormwater conveyance and treatment facilities within City rights-of way, to the extent possible, as well as provide recommended interim improvements and include recommendations for an operation and maintenance (O&M) and inspection program. The plan will incorporate guidance for water quantity and quality control contained in the Washington State Department of Ecology's 2012 *Stormwater Management Manual for Western Washington* and the 2012 WSU/Puget Sound Partnership *Low Impact Development Technical Guidance Manual for Puget Sound*.

Estimated Project Cost: $80,000

8 BASE MAP IMPROVEMENTS

The City plans to conduct a more thorough survey of its system in order to develop a more complete base map and inventory. The project would include ground survey, as-built review, and GIS work. The ultimate product of this project will be a complete base map providing the City with pipe invert elevations, diameters, materials, and lengths, as well as structure types. The base map will be of use in tracking pipe and structure inspection scheduling and cleaning. If the City is eventually subject to the NPDES Phase II requirements, a base map of the system will be necessary.

This work will also include the establishment of a web-based stormwater map that can serve as a status and maintenance log for City crews. The annual cost associated with the maintenance of the web map is estimated to be approximately $2,000 per year.

Estimated Project Cost: $50,000

9 LOW IMPACT DEVELOPMENT CODE UPDATES

The City is currently not subject to the NPDES Phase II rules, which would require the City to review, revise, and adopt development-related codes, rules, standards, or other enforceable documents to incorporate and require low impact development (LID) principles and LID BMPs. However, as stormwater management regulations continue to trend in the direction of LID, it is recommended that the City review and revise its code to incorporate these methods. This project will include a code gap analysis and recommendations for how the use of LID facilities can be incorporated into the City's development regulations.

Estimated Project Cost: $15,000

The Capital Improvement Projects (CIPs) are presented in order of priority. CIPs 1 through 3 will provide a substantial impact on drainage in larger areas of the City as compared to the other infrastructure projects, and these are recommended to be completed first. The Stormwater Comprehensive Plan is also suggested to be a priority, as it will provide a more complete and in-depth analysis of the City's existing infrastructure and of future improvements. Table 4-1 includes a summary of the projects.

TABLE 4-1

CIP Summary

Project Title	Project Cost
CIP 1 – East Frontage Road Storm Drain Cleaning	$115,000
CIP 2 – Ship's Watch Drainage Redirection to Spencer Creek	$199,000
CIP 3 – Spencer Creek Culvert Replacements	$216,000
CIP 4 – Juniper Street Outfall Rehabilitation	$440,000
CIP 5 – Ashland/Silverdust Ditch Capacity Improvement	$160,000
CIP 6 – South 10th Street and Birch Street Ditch Capacity Improvement	$170,000
CIP 7 – Stormwater Comprehensive Plan	$80,000
CIP 8 – Base Map Improvements	$50,000
CIP 9 – Low Impact Development Code Updates	$15,000
Total	**$1,445,000**

OPERATION AND MAINTENANCE REQUIREMENTS

CURRENT PRACTICES

The City currently maintains its stormwater system on an as-needed basis, when issues with clogged or compromised pipes or structures arise. The development of a stormwater utility will allow for the collection of funds to implement a more regular operation and maintenance program.

RECOMMENDED MAINTENANCE PROGRAM

The City's current maintenance program consists of routine ditch mowing, swale mowing, right-of-way mowing, catch basin cleaning, vegetation control of ponds, and as required, cleaning debris from pipes and vaults. Currently, maintenance of the stormwater system is complaint-based and occurs as flooding or overflows are reported. The City's current maintenance costs associated with the stormwater system are estimated to be approximately $30,000 per year, though detailed costs for stormwater activities are not generally recorded separately from other road or utility costs.

The types and quantities of stormwater facilities the City must maintain are shown in Table 4-2.

TABLE 4-2

Inventory of Stormwater Facilities

Facility	Quantity
Catch Basins	497 each
Storm Pipe	50,700 linear feet
Ditches	5,700 linear feet
Other Vaults/Structures	10 each

This inventory is assumed to include the majority of stormwater infrastructure within the City; however, the City's base map is not complete. The City's current base map can be found in Appendix F. As the City further develops its stormwater base map, the total length of pipe and ditches and the number of structures is likely to increase. The estimated maintenance effort for the stormwater system is therefore likely to increase slightly.

Two levels of operation and maintenance programs have been assumed in this analysis. The more rigorous program is described below and is expected to begin the year following implementation of the Stormwater Comprehensive Plan. A reduced maintenance schedule is included as an interim recommendation, before a formal Stormwater Comprehensive Plan is adopted.

The stormwater maintenance activities anticipated by City staff and the corresponding production units, estimated personnel hours, and estimated labor costs are shown in Table 4-3. This information is used to estimate the cost of the stormwater maintenance program and estimate the staff required to implement the program. It has been assumed that all maintenance activities will be completed by City staff and that the cost to the City is an average of $53,000 per year, based on a total compensation rate of $45 per hour per employee and an additional allowance for equipment and supplies of $8,000 total. The total City staff hours required for the maintenance activities identified in Table 4-3 is 996 hours, or approximately 1/2 of a full-time employee (FTE).

TABLE 4-3

Recommended Annual Operation and Maintenance Expenses

Activity	Production Unit	Number of Units	Manpower Requirement	Recommended Schedule	Approx. Hours	Est. Annual Cost
Inspect/Clean Catch Basins	20/day	497	2-man crew	1/year	400	$18,000
Other Vaults/Structures	10/day	10	2-man crew	1/year	16	$720
Ditch Mowing	3,000 ft/day	5,700	1-man crew	3/year	50	$2,250
Ditch Maintenance (sediment removal and maintenance)	3,000 ft/day	5,700	2-man crew	1/year	40	$1,800
Storm Pipe Cleaning	3,000 ft/day	50,700	2-man crew	1/4 of system/year	70	$3,150
Pipe Inspection (television)	3,000 ft/day	50,700	2-man crew	1/5 of system/year	60	$2,700
Miscellaneous Repairs	—	—	30 hours/month	as needed	360	$16,200
Equipment Rentals	—	—	—	as needed	—	$5,000
Supplies	—	—	—	as needed	—	$3,000
Total					**996**	**$52,820**

Inspections

The City should inspect all municipally owned stormwater treatment and flow control facilities annually, unless there are maintenance records to support a different frequency. Spot checks should be performed to detect potentially damaged permanent treatment and flow control facilities (other than catch basins) after a major (greater than 24-hour, 10-year) storm event. If spot checks indicate widespread damage/maintenance needs, inspect all stormwater treatment and flow control facilities that may be affected. Repair or take appropriate maintenance action in accordance with established maintenance standards.

All catch basins and inlets should be inspected once every year and should be cleaned to comply with established maintenance standards if inspections indicate a need. The decant water generated from catch basin cleaning must be disposed of properly.

Staff Training

The City should develop and implement an ongoing training program for City employees whose construction and O&M job functions may impact stormwater quality. This program would address the importance of protecting water quality, O&M standards, inspection procedures, BMP selection, ways to perform job activities to prevent impacts to water quality, and procedures for reporting water quality concerns.

At a minimum, staff should be educated on how to maintain catch basins, detention ponds and control structures, bioswales/ditches, and any other stormwater facilities implemented within the City. Staff should also be knowledgeable in identifying pollutant sources and in understanding pollutant control measures, spill response procedures, and environmentally acceptable material handling practices. Ecology's "Stormwater Pollution Prevention Planning for Industrial Facilities" (WQ-R-93-015, 9/93) may be used as a training reference. The City Public Works Director should be designated as responsible for setting up training for new employees regarding these issues. Renewal training for all employees on a biannual basis is recommended as well.

Personnel must also be well trained on sediment and erosion control issues so they can properly investigate and advise contractors regarding problem areas during construction. Staff members should be certified through the "Construction Site Erosion and Sediment Control Certification Course" offered by the Associated General Contractors of Washington Education Foundation or an approved equivalent. Equivalent certificates include:

- WSDOT certification in Construction Site Erosion and Sediment Control
- Certified Erosion and Sediment Control Lead (CESCL) offered by the International Erosion Control Association (IECA)

Erosion and sediment control certification for staff members should be renewed every 3 years.

Enforcement

City staffing levels must be sufficient to monitor construction activity, respond to surface water complaints, and provide periodic inspection of private stormwater treatment facilities, such as oil/water separators and detention facilities. Existing staff should document the hours spent on-site inspections and the frequency of inspection of construction sites and private stormwater facilities. From these records and the records of time spent responding to complaints, an understanding of the adequacy of the current staffing level can be gained.

Reduced Operation and Maintenance Program

Table 4-4 includes a reduced schedule for operation and maintenance, which is recommended in the interim before a full Stormwater Comprehensive Plan is implemented. The total cost of the reduced program is approximately $30,000 per year, requiring approximately 518 manhours, or 1/4 FTE.

TABLE 4-4

Annual Operation and Maintenance Expenses – Reduced Schedule

Activity	Production Unit	Number of Units	Manpower Requirement	Recommended Schedule	Approx. Hours	Est. Annual Cost
Inspect/Clean Catch Basins	20/day	497	2-man crew	1/4 per year	100	$4,500
Other Vaults/Structures	10/day	10	2-man crew	1/2 per year	8	$360
Ditch Mowing	3,000 ft/day	5,700	1-man crew	2/year	40	$1,800
Ditch Maintenance (sediment removal and maintenance)	3,000 ft/day	5,700	2-man crew	1/year	40	$1,800
Storm Pipe Cleaning	3,000 ft/day	50,700	2-man crew	1/5 of system/year	60	$2,700
Pipe Inspection (television)	3,000 ft/day	50,700	2-man crew	1/10 of system/year	30	$1,350
Miscellaneous Repairs	—	—	20 hours/month	as needed	240	$10,800
Equipment Rentals	—	—	—	as needed	—	$3,000
Supplies	—	—	—	as needed	—	$3,000
Total					**518**	**$29,310**

RECOMMENDED STORMWATER TECHNICAL MANUAL

The City of Kalama currently uses the 1992 Washington State Department of Ecology *Stormwater Management Manual for the Puget Sound Basin* (1992 Manual). Ecology has released several revised stormwater manuals since 1992, the latest of which, the *Stormwater Management Manual for Western Washington* (SWMMWW), was released in 2012 and amended in 2014.

The current City requirement for stormwater discharges to streams attempts to control streambank erosion by limiting the peak rate of runoff from individual development sites to between 50 percent of the 2-year existing flow durations to 100 percent of the existing 50-year flow durations are matched. This is in agreement with the 1992 Manual. The SWMMWW requires that flow durations be matched to the predeveloped, forested condition instead of the existing land cover condition. This results in larger detention volume requirements, as shown in Table 4-5.

TABLE 4-5

Comparison of Detention Requirements

Manual	Match Developed Flow Rates to	Required Detention Volume for a 40-Acre Subdivision (acre-feet)	Increase in Required Volume
1992 Manual	Existing Land Cover (assumed pasture)	8.3	—
2012 SWMMWW (amended in 2014)	Forested Land Cover	11	30%

Infiltration potential is limited in many areas of the City; however, infiltration usually presents the most natural method of stormwater management and closely mimics the native drainage conditions. As the first priority, streambank erosion control BMPs should utilize infiltration to the fullest extent practicable if site conditions are appropriate and groundwater quality can be protected. It is recommended that all stormwater that infiltrates into the soil receive water quality treatment. Treatment BMPs are recommended to be sized to capture and treat the water quality design storm, defined as the 6-month, 24-hour return period storm.

The SWMMWW places a strong emphasis on low impact development technologies. LID is an efficient method of decreasing the amount and rate of runoff associated with a developing site. The primary goal of LID methods is to mimic the predevelopment site hydrology by using site design techniques that store, infiltrate, evaporate, and detain runoff. Use of these techniques helps to reduce off-site runoff and ensure adequate groundwater recharge, where possible. As large portions of the City are underlain by rock and have poor infiltrative capacity, LID methods in the City would be directed more to the retention and restoration of native vegetation and topsoil. LID techniques are

applied throughout the site, whereas traditional detention/retention facilities are generally large facilities located at the downstream corner of a site or even farther away, such as a regional facility collecting runoff from multiple sites.

LID methods include more than just stormwater facilities. Planning plays an important role in LID, as reducing impervious surfaces and minimizing disturbance to existing vegetation are effective ways of reducing the impact of site development. Policies that limit the amount of impervious area per lot and preserve open space or sensitive area buffers are examples of LID techniques. The Department of Ecology recommends that LID include the following:

- Retain the native vegetation and soils to intercept, evaporate, and transpire stormwater on the site (rather than using traditional ponds and conveyances).
- Maintain and improve soil quality in order to improve infiltration, reduce runoff, and improve water quality.
- Cluster development and roads on the site and retain natural features that promote infiltration.
- Minimize impervious surface area and use permeable surfaces instead, where feasible.

Management practices used in low impact development design include minimizing the grading of the construction site, bioretention facilities, dry wells, filter/buffer strips, grass swales, rain gardens, soil amendment, pin pile foundations, rain barrels, cisterns and/or infiltration trenches.

If the City does adopt the SWMMWW and desires to expand the use of LID methods, City code should be updated to prescribe the use of LID methods on all new development or redevelopment. Additionally, because the City may be covered by a Phase II permit in the future, codifying LID would be one way of meeting several permitting requirements. Five of six requirements may be met through the use of LID including: public education and outreach, public participation, construction site and post-construction runoff control, and pollution prevention/good housekeeping.

LID design guidance is available in the *Low Impact Development Technical Guidance Manual for Puget Sound*, December 2012, developed by the Puget Sound Partnership and Washington State University Puyallup Research and Extension Center.

CHAPTER 5

SERVICE AND CONNECTION CHARGES

This section will evaluate the stormwater service and connection charges for a developed single-family parcel, or equivalent residential unit. The service and connection charges will be based on the impervious area of each parcel. Impervious area includes land covered by buildings, pavement, or other non-permeable surface.

ERU DETERMINATION

The stormwater service charge is based on operation, maintenance, repair, and preliminary capital improvement expenses divided by the number of impervious area ERUs. The impervious area per ERU was determined through a review of aerial photographs of the City for existing residences and through review of plans for recently developed residences.

The impervious surface of 150 single-family residential parcels was measured from aerial photographs. The average impervious area of these parcels was 3,320 square feet. A number of single-family residential parcels contain significantly more impervious area than the majority of parcels and would skew the calculation of average square footage. Those parcels with more than 6,500 square feet of impervious area were determined to be outliers. These parcels are located mostly in the rural areas of the City that are expected to be redeveloped in the future, which will eventually include impervious coverage comparable to the average.

A review of the recently developed lots in the Ship's Watch and Stone Forest developments resulted in impervious coverage ranging from 2,300 to 6,600 square feet. The average impervious area of these recently developed parcels is 3,892 square feet.

The average impervious coverage of 3,320 square feet per lot is lower than the ERU value used by the Cowlitz County stormwater management utility of 4,500 square feet. Based on this evaluation and because newly developed lots tend to have more impervious coverage than older developments, it is recommended that the City adopt an ERU value of 3,500 square feet of impervious surface, as median value between older properties and newer properties. For comparison, the ERU value of several nearby municipalities is provided in Table 5-1.

TABLE 5-1

ERU Values of Nearby Municipalities

Municipality	ERU Value (square feet)
Battle Ground	2,500
Camas	3,218
Ridgefield	3,500
Vancouver	3,000
Clark County	3,500
Cowlitz County	4,500
Castle Rock	3,255
Longview	2,500

Per City Zoning (KMC 17.18), the maximum impervious coverage for a single-family home is approximately 50 to 75 percent, depending on the zoning designation. The impervious coverage per the zoning code is in line with the suggested ERU value of 3,500 square feet. This is presented in Table 5-2.

TABLE 5-2

City Single-Family Zoning Lot Coverage (KMC 17.18)

Zoning Designation	Minimum Lot Area (square feet)	Maximum Impervious Coverage (%)	Maximum Impervious Coverage (square feet)
R-1 Single-Family	7,500	50	3,750
R-2 Single-Family	5,000	65	3,250
R-3 Single-Family	5,000	75	3,750

NON-SINGLE-FAMILY RESIDENTIAL PROPERTIES

Two types of Non-Single-Family Residential (non-SFR) land use were considered in this study; Multifamily Residential and Commercial.

There are currently approximately 42 existing multifamily residential parcels within the City, a majority of which are duplexes/triplexes. This number is likely to increase in the future. The allowable impervious coverage for these developments is described in KMC 17.18 and is summarized in Table 5-3.

TABLE 5-3

City Multifamily Zoning Lot Coverage (KMC 17.18)

Zoning Designation	Minimum Lot Area (square feet)	Maximum Impervious Coverage (%)	Maximum Impervious Coverage (square feet)
R-2 Townhome	2,000	65	1,300
R-2 Duplex	5,000	65	3,900
R-2 Other Residential	6,000	65	4,875
R-3 Townhome	2,000	75	1,500
R-3 Duplex	5,000	75	4,500
R-3 Other Residential	7,500	75	5,625

Because of the small lot size for townhome developments, it is recommended that each residential unit in the townhome be charged as 1/2 ERU. For duplexes, triplexes, and other residential developments, it is recommended that the City charge 1 ERU for the first residential unit on a multifamily parcel and 1/4 ERU per additional residential unit in the parcel. This reflects the portion of impervious cover compared to that of single-family residential parcels.

City code does not define a maximum coverage area for mixed-use or commercial zoning (KMC 17.25, 17.26). For most non-residential parcels within the City, the number of ERUs contained on each parcel was determined by review of aerial photographs. The impervious coverage on commercial lots located within the downtown area is nearly 100 percent, so impervious coverage of 95 percent has been assumed for the purpose of determining an ERU value for these commercial properties. The number of ERUs to be charged to each non-residential parcel was determined by dividing the impervious area on the parcel by 3,500 square feet, the ERU value. It is assumed that all non-residential parcels are charged a minimum of 1 ERU, and all others are rounded to the nearest 1/4 ERU (875 square feet of impervious surface). A table listing the impervious area for each non-residential parcel is provided in Appendix D.

Because commercial development is required to implement on-site stormwater management techniques, there is often initial opposition to any stormwater management utility rate. Public outreach and education should be provided, particularly to the commercial customers within the City regarding the benefit that City stormwater infrastructure provides to private businesses, citizens, and the environment. The information should focus on the fact that the major source of stormwater pollution is vehicle-generated pollution from roads.

Often, stormwater utilities will provide incentives for commercial property owners to maintain effective on-site stormwater detention and treatment. A program by which the commercial customer must regularly verify maintenance and proper operation of stormwater facilities should be put in place. The City generally takes responsibility for

the operation and maintenance of stormwater facilities, so a rate reduction structure is recommended only if the property owner adequately ensures that the City will not be responsible for the cost of maintenance. If a non-residential property installs a stormwater management system on site that treats and detains or infiltrates runoff in a manner meeting or exceeding the requirements of the City's adopted stormwater Manual, it is recommended that the City provide a rate reduction of 75 percent. On-site systems limit or eliminate impacts to the City's stormwater conveyance system, but the non-residential properties still benefit from road-related stormwater maintenance activities. For this reason, a fee reduction is recommended rather than a full elimination of the fee.

SYSTEM DEVELOPMENT CHARGES

An SDC can be based on the value of the City's existing storm drainage system divided by the number of existing ERUs. The City has limited records that indicate the date of installation or the construction cost of the storm drainage facilities. A physical inventory of the storm drainage system has been completed but a detailed database including system materials has not been compiled. This type of inventory would be part of a Stormwater Comprehensive Plan and is beyond the scope of this document. The City's current records indicate that the City owns and maintains approximately 51,000 LF of stormwater infrastructure. It is estimated that this infrastructure has a depreciated valuation of $1,250,000. Assuming 2,613 ERUs within the City, the value per ERU would be approximately $480. Based on the limited available data, the City could consider charging an SDC of $200 per ERU, initially. Once the detailed inventory is completed, this valuation can be updated and the SDC can be recalculated. The sample stormwater rate ordinance in Appendix B includes a section establishing an SDC.

SERVICE CHARGE

The monthly service charge per ERU is determined by dividing the operation and maintenance and capital improvement expenses by the existing number of ERUs. The rate determines how soon capital improvements may be completed. The operation and maintenance requirements were based on quantity information of the existing storm drainage system and the manpower needed to provide maintenance of the system. It was assumed that a limited operation and maintenance program will be continued until the Stormwater Comprehensive Plan is completed. At that time, a more comprehensive program will be put into place. This mainly involves more frequent cleaning and repairing of facilities.

A range of service charges was considered between $5.50 and $8.00 per ERU per month. An annual growth rate over the 20-year study period of 2 percent was assumed. No increase in rates is included, beyond an annual adjustment for inflation, which is assumed at 2 percent in this analysis. These analyses are included in Appendix E. A monthly service charge of $5.50 will provide income to allow for all identified capital projects to be completed within 15 years, while a monthly service charge of $8.00 would allow from

completion of the CIP list within 10 years of rate implementation without financing. If the City is able to acquire loans for most of the projects, the CIP schedule can be expedited. Repayment of loans may extend past the 20-year planning period, depending on the year in which the loans are obtained.

CHAPTER 6

RECOMMENDATIONS

This study recommends that the City collect a service charge of $5.50 per ERU per month, or $66 per ERU annually. The service charge will provide revenue for administration, operation and maintenance, and repair through capital improvement projects, though grant funding assistance is likely required to complete the Capital Improvement Plan. The revenue will also provide funds for the Stormwater Comprehensive Plan. The City should review the service charge and SDC annually to compare actual expenses and growth rate with the assumptions outlined in this study.

The study also recommends an SDC be established for the stormwater utility. This charge should be placed in a capital reserve account and be used to finance stormwater improvements. Property owners will be responsible for the cost of physically connecting their property to the existing stormwater system including plan review and inspection fees. An initial SDC at $200 per ERU is recommended. Once a complete stormwater system inventory and stormwater comprehensive plan are complete, the SDC should be revisited.

We understand that the City's first priority is to complete the Stormwater Comprehensive Plan. This plan may modify the recommended improvement plan and may reprioritize the listed improvements. The results of the plan may affect the service charge and SDC outlined in this study.

APPENDIX A

ORDINANCE FOR STORMWATER UTILITY FORMATION

CITY OF KALAMA
ORDINANCE NUMBER _____

AN ORDINANCE RELATING TO SURFACE AND STORMWATER DRAINAGE, ESTABLISHING A STORMWATER UTILITY AND TRANSFERRING ALL RIGHTS AND INTERESTS NOW OWNED BY THE CITY AND PERTAINING TO SURFACE AND STORMWATER DRAINAGE TO THE UTILITY.

WHEREAS, the City is authorized pursuant to the general police powers, RCW 35.67.020 and RCW 35.92.020, to construct, condemn and purchase, acquire, add to, maintain, conduct and operate a storm drainage system; and

WHEREAS, pursuant to the Constitution of the State of Washington, Article 11, Section 11, cities have the power to enact regulations in the interest of the health, safety and welfare of its residents; and

WHEREAS, the City Council of the City of Kalama has expressed concern regarding the control and prevention of flooding, erosion, sedimentation and surface and stormwater quality degradation pursuant to an overall management plan; and

WHEREAS, after review of the various presentations made to the City Council, the City Council finds specifically that land use and development affecting surface and stormwater should be managed, regulated and controlled under the unified management of a Stormwater Utility to reduce or control flooding, erosion, sedimentation, and particulate and other pollution of surface and stormwater, danger and damage to life and property, and to protect and encourage the use of natural and efficient man-made means to these ends and that a comprehensive stormwater plan should be adopted for such purposes; and

WHEREAS, to research and correct these problems in a cost-effective manner, acceptable to the City, requires a source of revenue to pay for the associated costs; and

WHEREAS, it is the desire of the City to incorporate into the proposed utility all surface water courses the title to which is now held or in the future will be held by the City,

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KALAMA, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Definitions. The following words when used herein shall have the following meanings, unless the context clearly indicates otherwise:

A. "Comprehensive Stormwater Plan" means a plan, developed for the purposes of mapping and analyzing the City's surface and stormwater drainage system, identifying problem areas, and providing recommendations for capital improvements, best management practices, policy changes, and funding.

B. “Service Charge” means the monthly fee levied by the Utility upon all developed real property within the boundaries of the Utility as authorized by Sections 2 and 3 of this ordinance.

C. “Storm Drainage System” means constructed drainage facilities and any natural surface water drainage features that provide any combination of collecting, storing, controlling, treating or conveying surface and stormwater.

D. “Stormwater” means water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, and wetlands, as well as shallow groundwater.

E. “System Development Charge” means that fee authorized by the Council and charged by the Utility to property which is developed after the effective date of this ordinance, which charge reflects a proportionate share of the Utility's capital costs attributable to the newly developed property.

F. “Utility” means the City of Kalama, Washington Stormwater Utility, a utility which operates and maintains the surface and stormwater drains, channels and facilities, outfalls for storm drainage and the rights and interests in property relating to the system. The boundaries of the utility are the corporate limits of the City.

Section 2. Creation of Stormwater Utility.

A. There is hereby created and established a surface and stormwater utility which shall be known as the "City of Kalama, Washington, Stormwater Utility" (the "Utility"), for the purposes set forth in Section 2. B.

B. The City shall exercise, through the Utility where possible, all the lawful powers necessary and appropriate to the construction, condemnation and purchase, acquisition, addition to, maintenance, conduct and operation, management, regulation and control of the surface and stormwater within the boundaries of the City, as necessary to protect the health, safety, and welfare of the citizens of the City; including, without limitation, all the lawful powers to fix, alter, regulate and control the rates, charges and conditions for the use thereof, to purchase and condemn property on behalf of the Utility, to regulate actions taken with respect to public and private property which affect the flow of surface and stormwater and the use of drainage facilities, and to adopt, alter, and amend a plan adopted as necessary to implement the policies of the City pertaining to surface and stormwater drainage.

C. It is not the purpose of this ordinance to create a duty of the City or its Utility to insure or protect individual persons or property against water drainage.

Section 3. Administrator of Utility. The City Administrator or the official designated by the City Administrator shall be administrator of the Utility and shall report directly to the City Administrator.

Section 4. Stormwater Utility Fund.

A. There is hereby created a fund which shall be known as the "Stormwater Utility Fund". All revenues, assessments, and other charges collected by the Utility, or otherwise received for drainage purposes or attributable to the operation and maintenance of the Utility, and all loans to or grants or funds received for its construction, improvement and operation, shall be deposited in the Stormwater Utility Fund. All disbursements for costs of data collection, planning, designing, constructing, acquiring, maintaining, operating, and improving the drainage utility facilities, whether such facilities are natural, constructed or both, and administering the Utility shall be made from the Stormwater Utility Fund.

B. The City may create, at such time or times as it deems appropriate, any other funds necessary to the administration of the Stormwater Utility and may designate the revenues to be placed therein and the purpose or purposes of such funds which may be the same as one, some or all of the purposes designated in this section as the purposes of the Stormwater Utility Fund created herein, and such purposes shall then be transferred to such newly created fund.

Section 5. Authority to Establish Rates and Charges. The City shall establish by ordinance rate classifications, service charges, general facilities charges, inspection, permitting, application, and such other fees and charges necessary and sufficient in the opinion of the City Council to pay for the following:

A. The costs associated with the development and adoption of a comprehensive stormwater plan;

B. The costs, including debt service and related financing expenses, for the construction, and reconstruction of storm drainage facilities necessary or useful for the handling of surface and stormwater within the City, but not presently in existence;

C. The operation, repair, maintenance, improvement, replacement and reconstruction of storm drainage facilities within the City which presently exist;

D. The acquisition of real property interests, which may be useful or necessary for the storm drainage system in the City including but not limited to land necessary for the installation and construction of storm drainage facilities, and all other facilities, including retention and detention facilities, which are reasonably required for proper and adequate handling of stormwater within the City;

E. The costs of monitoring, inspection, enforcement and administration of the Utility including but not limited to water quality surveillance, private drainage facility maintenance inspection, construction inspection and other activities which are reasonably required for the proper and adequate implementation of the City's surface and stormwater policies;

F. The construction and subsequent maintenance of those future facilities as required by the Utility; and

G. Creation and implementation of ordinances, policies, standards, and procedures for the purposes of gaining compliance with state or federal rules and regulations.

The fees and charges to be paid and collected pursuant hereto shall not be used for general or other governmental or proprietary purposes of the City, except to pay for the equitable share of the costs of accounting, management, legally levied taxes, and government thereof incurred on behalf of the Utility.

Section 6. Limitation of Liability. This ordinance, any drainage code to be adopted by the City Council to implement this ordinance, and any guidelines, rules, standards, specifications, requirements, regulations and procedures established pursuant to any section of such code are intended to provide the authority and processes to achieve cost-effective surface and stormwater management in accordance with reasonable standards for such management in the City as necessary to protect the health, safety, and welfare of the citizens and of the City. No City liability shall be inferred, implied, or interpreted by the adoption and application of this ordinance for damages to individual persons or properties which result from existing conditions or which occur subsequent to the date of this Ordinance. There shall be no liability associated with the Utility's approval of any privately constructed portion of the storm drainage system and/or privately maintained portion of the storm drainage system unless the City accepts the same as part of its publicly owned and/or maintained system.

Section 7. Severability. If any portion of this ordinance as now or hereafter amended, or its application to any person or circumstances, is held invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole, or any section, provision or part thereof not adjudged to be invalid or unconstitutional, and its application to other persons or circumstances shall not be affected.

Section 8. Effective Date. This Ordinance shall take effect and be in force five (5) days after its passage, approval and publication according to law.

PASSED BY THE CITY COUNCIL OF THE CITY OF KALAMA THIS ____ DAY OF _____, 2018; AND SIGNED IN AUTHENTICATION OF ITS PASSAGE THIS _____ DAY OF_____, 2018.

_____
Mike Reuter, Mayor

ATTESTED BY:

_____
Coni McMaster, Clerk

APPROVED AS TO FORM:

_____
, City Attorney

AYES:
NAYS:
ABSENT:
EXCUSED:

APPENDIX B

ORDINANCE ESTABLISHING STORMWATER UTILITY RATES

CITY OF KALAMA
ORDINANCE NUMBER ____

AN ORDINANCE ESTABLISHING A RATE STRUCTURE POLICY FOR THE STORMWATER UTILITY OF THE CITY OF KALAMA, WASHINGTON, ESTABLISHING SERVICE CHARGES FOR SUCH UTILITY, PROVIDING AUTHORITY FOR THE COLLECTION THEREOF.

WHEREAS, the City of Kalama, Washington (the "City"), created a Stormwater Utility to implement and administer its Stormwater Management Program; and

WHEREAS, the City is authorized pursuant to the general police powers, RCW 35.67.020 and RCW 35.92.020, to fix, alter, regulate and control the rates and charges for use of said Utility and the Stormwater Management Program of the City; and

WHEREAS, the City Council finds that it is now necessary to establish rates and charges for the payment of the cost and expense of operating said Utility; and

WHEREAS, the City Council finds that all developed real property within the boundaries of the Utility benefits from the Stormwater Utility of the City and should participate financially in the payment of all expenses for maintenance, operation and improvement of said storm drainage system and for administration of the Utility;

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF KALAMA, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Definitions. The following words when used herein shall have the following meanings, unless the context clearly indicates otherwise:

A. "Best Management Practices" ("BMPs") means the best available and reasonable physical, structural, managerial, or behavioral activities, that when used singly or in combination, eliminate or reduce the contamination of surface and/or ground water.

B. “Commercial Properties” include commercial, multifamily residential – 3 units or greater, industrial and institutional properties.

C. "Developed" means that condition of real property altered from its natural state by the addition to or construction on such property of impervious ground surface or other manmade physical improvements such that the drainage characteristics of the property or portion thereof is affected.

D. “Duplex” means any structure which contains no more than 2 residences or 2 residential units which are within a single structure and are used primarily for residential purposes

E. “Dwelling Unit – Single-family” means a structure consisting of one detached building in which there are facilities for the living accommodations of one family.

F. “Equivalent Residential Unit” (“ERU”) means and shall be equal to 3,500 square feet of Impervious Surface and is the measure of Impervious Surface to be used by the Utility in assessing Service Charges and System Development Charges against each parcel of property.

G. "Impervious Surface" means a hard surface area which either prevents or retards the entry of water into the soil mantle as it entered under natural conditions prior to development, or a hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roofs, sidewalks, walkways, patios, concrete or asphalt paving, driveways, parking lots, storage areas, areas which are paved, graveled, or made of packed earthen materials and other surfaces which similarly impede the natural infiltration of surface and storm water. Open, uncovered flow control or water quality treatment facilities shall not be considered as impervious surfaces.

H. “Manual” means the most recently adopted technical drainage manual that describes the requirements for drainage review, drainage plan and report submittal, hydrologic analysis and design, flow control design, water quality design, and other technical requirements.

I. "Natural Surface Water Drainage System" means such landscape features as rivers, streams, lakes and wetlands.

J. "Parcel" means the smallest separately segregated unit or plot of land having an identified owner, boundaries and surface area which is documented for property tax purposes and given a tax lot number by the Cowlitz County assessor.

K. "Person" means any individual, firm, company, association, corporation or governmental agency.

L. "Program" means the Stormwater Management Program.

M. "Service Charge" means the monthly fee levied by the Utility upon all developed real property within the boundaries of the Utility as authorized by Sections 2 and 3 of this ordinance.

N. “Storm Drainage System” means constructed drainage facilities and any natural surface water drainage features that do any combination of collecting, storing, controlling, treating or conveying surface and stormwater.

O. "Stormwater" means water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, and wetlands, as well as shallow groundwater.

P. "Stormwater Management Program" means the services provided by the City relating to surface and stormwater drainage, including but not limited to, basin planning, facilities operations and maintenance, regulation, financial administration, public involvement, drainage investigation and enforcement, aquatic resource restoration, surface and stormwater quality and environmental monitoring, natural surface water drainage system planning, intergovernmental relations and facility design and construction.

Q. "System Development Charge" means that fee authorized by the Council and charged by the Utility to property which is developed after the effective date of this ordinance, which charge reflects a proportionate share of the Utility's capital costs attributable to the newly developed property.

R. "Undeveloped Parcel" means any parcel, which has not been altered from its natural state by the construction, creation or addition of impervious surface.

S. "Utility" means the City of Kalama, Washington Stormwater Utility, a utility which operates and maintains the surface and storm water drains, channels and facilities, outfalls for storm drainage and the rights and interests in property relating to the system. The boundaries of the utility are the corporate limits of the City.

T. "Water Quality Treatment Facility" means a drainage facility designed to reduce pollutants once they are already contained in surface and storm water runoff. Water quality treatment facilities are the structural component of BMPs. When used singly or in combination, water quality treatment facilities reduce the potential for contamination of surface and/or ground water.

Section 2. Rate Structure.

A. It shall be the policy of the City that the rate structure to be applied in establishing the amount of Service Charges and System Development Charges assessed against each parcel of developed real property within the boundaries of the Utility shall be based upon the amount of Impervious Surface contained within each parcel of property as set forth below.

B. The City shall determine the service charge for each parcel within the service area by the following methodology:

1. All single family dwelling units and accessory uses thereof are deemed to contain one (1) Equivalent Residential Unit.
2. Each dwelling unit of a duplex structure is deemed to contain one (1) Equivalent Residential Unit.
3. All other developed real properties within the Utility boundaries, the Utility shall determine the number of Equivalent Residential Units by dividing the number of square feet of Impervious Surface on each property

by 3,500 square feet per ERU; the total thus obtained will be rounded to the nearest quarter (1/4) representing the Equivalent Residential Units contained on such property. Each developed parcel of property shall be deemed to comprise a minimum of one Equivalent Residential Unit.

C. Property Exempt from Service Charges. The following special categories of property are exempt from Service Charges and System Development Charges:

1. City street rights-of-way;
2. Washington State rights-of-way: and
3. Undeveloped parcels.

Section 3. Service Charge Rates. In accordance with the rate structure set forth in Section 2 of this ordinance, there is hereby levied upon all developed real property within the boundaries of the Utility the following Service Charges which shall be collected from the owners of such properties:

A. For all single family dwelling units and accessory uses thereof, (One Equivalent Residential Unit), the monthly Service Charge shall be $_____ per month.
B. For all other developed property within the boundaries of the Utility, unless exempt as set forth above, the monthly Service Charge shall be $_____ per month per ERU multiplied by the number of Equivalent Residential Units determined by the Utility to be contained in such parcel.

Section 4. Credits for Qualified Existing or New Stormwater Facilities.

A. The City of Kalama recognizes that some commercial property owners have constructed private on-site stormwater quality and quantity mitigation facilities ("facilities"), which may aid the City in controlling the overall effects of stormwater pollution and those other problems necessitating that the City enact this chapter. Properties or portions of properties with facilities that meet one of the criteria listed below, to the City's satisfaction, shall receive a reduction of 75% from the monthly fee charged under Section 3 as currently enacted or hereafter amended.

1. Any property with a properly maintained water quantity and quality facility that meets or exceeds the design requirements of the adopted stormwater Manual.

2. Any property that has an active and valid NPDES permit that includes stormwater requirements. A copy of the permit and the Storm Water Pollution Prevention Plan (SWPPP) shall be provided to the City.

The property owner is responsible for providing all documentation necessary to demonstrate that the design and construction of any water quality and/or water quantity facility meets the above requirements. Documentation shall be by a licensed civil

engineer with the State of Washington. In the event facilities or control measures address only a portion of the total property, the credit will be applied to only that affected portion. The property owner must maintain any water quantity and/or quality control facility in accordance with Department of Ecology maintenance guidelines and appropriate practice to ensure proper function and effectiveness of the facility. Failure to maintain the facilities within 30 days after written notice may be cause for termination of the credit granted in this section.

Section 5. System Development Charge

A. Beginning on the effective date of the ordinance codified in this section, and thereafter in addition to other fees required by ordinance or pursuant to agreement, there is imposed upon the owners of property seeking to connect to the City's stormwater system a system development charge. This system development charge is determined as the product of $200.00 times the number of equivalent residential units (ERU) ($200.00 x ERU).

B. The system development charge shall be paid and collected at the time of permit issuance for development and prior to actual development.

C. Applicants for development shall be required to pay the stormwater system development charge in effect at the time the permit is issued.

Section 6. Rate Adjustments and Appeals.

A. Any person billed for service charges may file a "request for rate adjustment" with the City within two years of the date from which the bill was sent. Rate adjustment request forms shall be available at the City Clerks' office. However, filing of such request does not extend the period for payment of the charge.

B. Requests for rate adjustment may be granted or approved by the City Administrator only when at least one of the following conditions exist:

1. The service charge bill was otherwise not calculated in accordance with this ordinance.

C. The property owner shall have the burden of proving that the rate adjustment sought should be granted.

D. Decisions on requests for rate adjustments shall be made by the City Administrator based on information submitted by the applicant within thirty days of the adjustment request except when additional information is needed. The applicant shall be notified in writing of the City's decision. If an adjustment is granted which reduces the charge for the current year or two prior years, the

applicant shall be refunded the amount overpaid in the current and two prior years.

E. If the City Administrator finds that a service charge bill has been undercharged, then an amended bill shall be issued which reflects the increase in the service charge. The City may include in the bill the amount undercharged for two previous billing years in addition to the current bill.

F. Decisions of the City Administrator, on requests for rate adjustments shall be final unless within thirty days of the date the decision was mailed, the applicant submits in writing to the City Administrator a notice of appeal setting forth a brief statement of the grounds for appeal and requesting a hearing before the Hearings Examiner.

Section 7. Billing Procedure and Collection.

A. All property subject to charges of the program shall be billed based on the property characteristics existing one month prior billing. All property is billed monthly beginning January 1st of each year.

B. All Service Charges, System Development Charges and all other fees or charges hereafter established by the City Council by ordinance shall be deemed to be levied upon real property.

C. The City shall have a lien for all delinquent and unpaid charges and fees for storm drainage purposes, including without limitation Service Charges and System Development Charges, assessed against all parcels to which service was furnished, which lien shall have the superiority established by RCW §35.67.200 and shall be foreclosed in the manner provided in RCW §35.67.220 et seq.

D. Service charges shall be deemed delinquent if not paid by the end of the month of the billing date. A late charge equal to 10 percent or $5, whichever is greater, of the delinquent service charge shall be imposed at the time of such delinquency and interest at the rate of 12 per cent per annum shall be charged on all delinquent service charges and late charges. If the delinquent service charge or imposed interest is usurious under Washington law, then the maximum charge and/or interest rate allowable by law will be imposed.

Section 8. Annual Review of Charges and Fees. The charges and fees established by this ordinance and any other ordinances of the City Council establishing charges and fees for the Utility may be reviewed annually by the City Council.

Section 9. Effective Date of Service Charge. The Service Charge herein established shall apply to on or after January 1, 2019 and shall be billed beginning in January 2019.

Section 10. Severability. If any portion of this ordinance as now or hereafter amended, or its application to any person or circumstances, is held invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole, or any section, provision or part thereof not adjudged to be invalid or unconstitutional, and its application to other persons or circumstances shall not be affected.

Section 11. Effective Date. This Ordinance shall take effect and be in force five (5) days after its passage, approval and publication according to law.

PASSED BY THE CITY COUNCIL OF THE CITY OF KALAMA THIS _____ DAY OF _____, 2018; AND SIGNED IN AUTHENTICATION OF ITS PASSAGE THIS _____ DAY OF _____, 2018.

_____
Mike Reuter, Mayor

ATTESTED BY:

_____
Coni McMaster, Clerk

APPROVED AS TO FORM:

_____
, City Attorney

AYES:
NAYS:
ABSENT:
EXCUSED:

APPENDIX C

CAPITAL IMPROVEMENT PLAN COST ESTIMATES

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 1 - E Frontage Road Storm Drain Cleaning

	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 11,000	$ 11,000
2	SPCC Plan	1	LS	$ 1,000	$ 1,000
3	Traffic Control	1	LS	$ 3,000	$ 3,000
4	Locate Existing Utilities	1	LS	$ 2,000	$ 2,000
5	Removal of Structures and Obstructions	1	LS	$ -	$ -
6	Erosion Control	1	LS	$ 3,000	$ 3,000
7	Quarry Spalls	10	TN	$ 100	$ 1,000
8	Pipe Cleaning (incl. Waste Material Removal,	1,100	LF	$ 5	$ 5,500
9	TV Inspection of Storm Pipe	1,100	LF	$ 5	$ 5,500
10	Seeding Fertilizing and Mulching	3,500	SY	$ 7	$ 24,500
11	Clean/Grade Existing Ditch	3,500	SY	$ 5	$ 17,500
	Subtotal				$ 74,000
	Contingency (30%)				$ 22,200
	Subtotal				$ 96,200
	Sales Tax (7.9%)				$ 7,600
	Total				$ 103,800
	Total Construction Cost (Rounded)				**$ 104,000**
	All Overhead (10%)				$ 11,000
	Total Project Cost (Rounded)				**$ 115,000**

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 2 - Ship's Watch Drainage Redirection to Spencer Creek

	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 16,000	$ 16,000
2	SPCC Plan	1	LS	$ 1,000	$ 1,000
3	Traffic Control	1	LS	$ 4,000	$ 4,000
4	Locate Existing Utilities	1	LS	$ 2,000	$ 2,000
5	Removal of Structures and Obstructions	1	LS	$ 4,000	$ 4,000
6	Erosion Control	1	LS	$ 4,000	$ 4,000
7	48" Precast Type 2 Catch Basin (Basic to 8')	3	EA	$ 3,500	$ 10,500
8	12" CPEP (Including bedding, backfill)	200	LF	$ 70	$ 14,000
9	Abandon Existing Pipe	1	LS	$ 5,000	$ 5,000
10	Connection to Existing System	2	EA	$ 2,000	$ 4,000
11	Crushed Surfacing Base Course	32	TN	$ 45	$ 1,440
12	Crushed Surfacing Top Course	32	TN	$ 45	$ 1,440
13	Hot Mix Asphalt	42	TN	$ 150	$ 6,300
14	Quarry Spalls	10	TN	$ 100	$ 1,000
15	Gravel for Drains	150	TN	$ 40	$ 6,000
16	18" CPEP (Including bedding, backfill)	300	LF	$ 90	$ 27,000
17	Seeding Fertilizing and Mulching	150	SY	$ 7	$ 1,050

Subtotal	$ 108,730
Contingency (30%)	$ 32,619
Subtotal	$ 141,349
Sales Tax (7.9%)	$ 11,167
Total	$ 152,516
Total Construction Cost (Rounded)	**$ 153,000**
All Overhead (30%)	$ 46,000
Total Project Cost (Rounded)	**$ 199,000**

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 3 - Spencer Creek Culvert Replacements

	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 17,000	$ 17,000
2	SPCC Plan	1	LS	$ 1,000	$ 1,000
3	Traffic Control	1	LS	$ 9,000	$ 9,000
4	Locate Existing Utilities	1	LS	$ 2,000	$ 2,000
5	Removal of Structures and Obstructions	1	LS	$ 5,000	$ 5,000
6	Erosion Control	1	LS	$ 5,000	$ 5,000
7	48" Precast Type 2 Catch Basin (Basic to 8')	0	EA	$ 3,500	$ -
8	24" CPEP (Including bedding, backfill)	175	LF	$ 150	$ 26,250
9	Abandon Existing Outfall	0	EA	$ 5,000	$ -
10	Connection to Existing System	0	EA	$ 2,000	$ -
11	Crushed Surfacing Base Course	20	TN	$ 45	$ 900
12	Crushed Surfacing Top Course	20	TN	$ 45	$ 900
13	Hot Mix Asphalt	20	TN	$ 150	$ 3,000
14	Quarry Spalls	25	TN	$ 100	$ 2,500
15	Gravel for Drains	0	TN	$ 40	$ -
16	36" CPEP (Including bedding, backfill)	100	LF	$ 400	$ 40,000
17	Seeding Fertilizing and Mulching	150	SY	$ 7	$ 1,050
18	Reshape Existing Ditch	150	SY	$ 30	$ 4,500

Subtotal	$ 118,100
Contingency (30%)	$ 35,430
Subtotal	$ 153,530
Sales Tax (7.9%)	$ 12,129
Total	$ 165,659
Total Construction Cost (Rounded)	**$ 166,000**
All Overhead (30%)	$ 50,000
Total Project Cost (Rounded)	**$ 216,000**

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 4 - Juniper Street Outfall Rehabilitation

	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 34,000	$ 34,000
2	SPCC Plan	1	LS	$ 1,000	$ 1,000
3	Traffic Control	1	LS	$ 9,000	$ 9,000
4	Locate Existing Utilities	1	LS	$ 4,000	$ 4,000
5	Removal of Structures and Obstructions	1	LS	$ 9,000	$ 9,000
6	Erosion Control	1	LS	$ 17,000	$ 17,000
7	72" Precast Type 2 Catch Basin (Basic to 8')	1	EA	$ 7,000	$ 7,000
8	54" Precast Type 2 Catch Basin (Basic to 8')	1	EA	$ 4,500	$ 4,500
9	30" CPEP (Including bedding, backfill)	400	LF	$ 300	$ 120,000
10	Connection to Existing System	2	EA	$ 2,000	$ 4,000
11	Crushed Surfacing Base Course	5	TN	$ 45	$ 225
12	Crushed Surfacing Top Course	5	TN	$ 45	$ 225
13	Hot Mix Asphalt	5	TN	$ 150	$ 750
14	Quarry Spalls	20	TN	$ 100	$ 2,000
15	Pipe Anchor	10	EA	$ 2,500	$ 25,000
16	Seeding Fertilizing and Mulching	50	SY	$ 7	$ 350
17	Reshape/Fill Existing Ditch	50	SY	$ 50	$ 2,500

Subtotal	$ 240,550
Contingency (30%)	$ 72,165
Subtotal	$ 312,715
Sales Tax (7.9%)	$ 24,704
Total	$ 337,419
Total Construction Cost (Rounded)	**$ 338,000**
All Overhead (30%)	$ 102,000
Total Project Cost (Rounded)	**$ 440,000**

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 5 - Ashland/Silverdust Ditch Capacity Improvement

	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 12,000	$ 12,000
2	SPCC Plan	1	LS	$ 1,000	$ 1,000
3	Traffic Control	1	LS	$ 3,000	$ 3,000
4	Locate Existing Utilities	1	LS	$ 2,000	$ 2,000
5	Removal of Structures and Obstructions	1	LS	$ 3,000	$ 3,000
6	Erosion Control	1	LS	$ 3,000	$ 3,000
7	48" Precast Type 2 Catch Basin (Basic to 8')	0	EA	$ 3,500	$ -
8	30" CPEP (Including bedding, backfill)	0	LF	$ 300	$ -
9	Connection to Existing System	0	EA	$ 2,000	$ -
10	Crushed Surfacing Base Course	0	TN	$ 45	$ -
11	Crushed Surfacing Top Course	0	TN	$ 45	$ -
12	Hot Mix Asphalt	0	TN	$ 150	$ -
13	Quarry Spalls	10	TN	$ 100	$ 1,000
14	Pipe Cleaning (incl. Waste Material Removal,	400	LF	$ 5	$ 2,000
15	Seeding Fertilizing and Mulching	1,500	SY	$ 7	$ 10,500
16	Reshape Existing Ditch	1,500	SY	$ 30	$ 45,000
				Subtotal	$ 82,500
				Contingency (30%)	$ 24,750
				Subtotal	$ 107,250
				Sales Tax (7.9%)	$ 8,473
				Total	$ 115,723
				Total Construction Cost (Rounded)	**$ 120,000**
				All Overhead (30%)	$ 40,000
				Total Project Cost (Rounded)	**$ 160,000**

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 6 - S 10th Street and Birch Street Ditch Capacity Improvement

	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 13,000	$ 13,000
2	SPCC Plan	1	LS	$ 1,000	$ 1,000
3	Traffic Control	1	LS	$ 4,000	$ 4,000
4	Locate Existing Utilities	1	LS	$ 2,000	$ 2,000
5	Removal of Structures and Obstructions	1	LS	$ 4,000	$ 4,000
6	Erosion Control	1	LS	$ 4,000	$ 4,000
7	48" Precast Type 2 Catch Basin (Basic to 8')	0	EA	$ 3,500	$ -
8	24" CPEP (Including bedding, backfill)	35	LF	$ 150	$ 5,250
9	Abandon Existing Outfall	0	EA	$ 5,000	$ -
10	Connection to Existing System	0	EA	$ 2,000	$ -
11	Crushed Surfacing Base Course	0	TN	$ 45	$ -
12	Crushed Surfacing Top Course	10	TN	$ 45	$ 450
13	Hot Mix Asphalt	0	TN	$ 150	$ -
14	Quarry Spalls	10	TN	$ 100	$ 1,000
15	30" CPEP (Including bedding, backfill)	0	LF	$ 300	$ -
16	Pipe Cleaning (incl. Waste Material Remova	60	LF	$ 5	$ 300
17	Seeding Fertilizing and Mulching	1,500	SY	$ 7	$ 10,500
18	Reshape Existing Ditch	1,500	SY	$ 30	$ 45,000
	Subtotal				$ 90,500
	Contingency (30%)				$ 27,150
	Subtotal				$ 117,650
	Sales Tax (7.9%)				$ 9,294
	Total				$ 126,944
	Total Construction Cost (Rounded)				**$ 130,000**
	All Overhead (30%)				$ 40,000
	Total Project Cost (Rounded)				**$ 170,000**

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 7 - Stormwater Comprehensive Plan

	Item	Quantity		Unit Cost	Total
1	Stormwater Plan	1	LS	$ 80,000	$ 80,000
		Subtotal			$ 80,000
	Total Project Cost (Rounded)				**$ 80,000**

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 8 - Basemap Improvements

	Item	Quantity		Unit Cost	Total
1	GIS Basemap Improvements	1	LS	$ 30,000	$ 30,000
2	Establish Stormwater App	1	LS	$ 20,000	$ 20,000
		Subtotal			$ 50,000
	Total Project Cost (Rounded)				**$ 50,000**

Annual Stormwater App Fees $2,000

City of Kalama
2018 Stormwater Utility Formation
Capital Improvement Plan
CIP 9 - LID Code Updates

	Item	Quantity		Unit Cost	Total
1	LID Code Updates	1	LS	$ 15,000	$ 15,000
		Subtotal			$ 15,000
	Total Project Cost (Rounded)				**$ 15,000**

APPENDIX D

COMMERCIAL IMPERVIOUS AREA

Appendix D: Commercial Parcels Impervious Area

Parcel ID	Account Number	Address	Impervious Area (sqft)	Calculated ERUs	Reduced Rate
40724	R041083	550 N 1ST ST	12,616	3.75	
41247	R047084	5225 MEEKER DR	130,801	37.5	
40113	R040430	262 N 1ST ST	10,514	3.25	
40114	R040431		7,009	2.25	
40115	R040432	222 N 1ST AVE	7,009	2.25	
40116	R040433	210 N 1ST ST	2,253	1	
40950	R041194	136 N 4TH ST	15,019	4.5	
41086	R041358	6325 S OLD PACIFIC HWY	33,645	9.75	
40721	R041079	565 N 1ST ST	21,027	6.25	
40728	R041087	524 N 1ST ST	14,018	4.25	
40718	R041076	49 IVY ST	7,009	2.25	
4072901	R041089	602 E FRONTAGE RD	26,350	7.75	
40735	R041091	698 E FRONTAGE RD	9,214	2.75	
40009	R040340	155 ELM ST	7,223	2.25	
40042	R040373	173 N 1ST ST	3,505	1.25	
40043	R040374	175 N 1ST ST	1,627	1	
400601	R040389	154 N 1ST ST	3,505	1.25	
40061	R040390	124 N 1ST ST	7,009	2.25	
40062	R040391	124 ELM ST	7,009	2.25	
40077	R040407	396 ELM ST	8,761	2.75	
40037	R040369	119 N 1ST ST	7,009	2.25	
40040	R040371	157 N 1ST ST	3,505	1.25	
40050	R040378	111 N 2ND ST	5,057	1.5	
40059	R040387	164 N 1ST ST	7,009	2.25	
40096	R040418	259 N 1ST ST	7,009	2.25	
40098	R040420	297 N 1ST ST	4,205	1.25	
40112	R040429	270 N 1ST ST	7,009	2.25	
4011601	R040434	150 FIR ST	1,252	1	
4019301	R040499	290 N 1ST ST	25,462	7.5	
40360	R040665	357 S 9TH ST	7,510	2.25	
40197	R040503	384 N 1ST ST	9,012	2.75	
40751	R041103		2,679	1	
40752	R041104		2,474	1	
41258	R047097	5303 MEEKER DR	45,283	13	
41046	R041308	413 N 1ST ST	7,009	2.25	
40714	R041072	454 N 1ST ST	7,510	2.25	
40704	R041063	447 N 1ST ST	12,903	3.75	
40706	R041065	498 E FRONTAGE RD	7,009	2.25	
40720	R041078	535 N 1ST ST	7,009	2.25	
40747	R041102		12,406	3.75	
40038	R040370	135 N 1ST ST	7,009	2.25	
40041	R040372	165 N 1ST ST	3,505	1.25	
40060	R040388	134 N 1ST ST	7,009	2.25	
40097	R040419	274 E FRONTAGE RD	6,308	2	
40099	R040421	299 N 1ST ST	3,505	1.25	
40111	R040428	290 N 1ST ST	7,009	2.25	
40196	R040502	362 N 1ST ST	12,015	3.5	
40753	R041105	748 E FRONTAGE RD	6,142	2	
41076	R041347	501 CLOVERDALE RD	41,068	11.75	
411640100	R041451	7349 S OLD PACIFIC HWY	127,655	36.5	
40088	R040417	223 N 1ST ST	21,027	6.25	

40130	R040447	344 E FRONTAGE RD	14,018	4.25	
411870100	R049589	1111 TAYLOR RD	-	1	
40194	R040500	334 N 1ST ST	9,012	2.75	
40195	R040501		6,008	1.75	
41057	R041319		1,422	1	
41058	R041320		2,563	1	
41095	R041321		2,979	1	
1603002	R005235	1094 CHINA GARDEN RD	-	1	
411840110	R092462	1072 CHINA GARDEN RD	-	1	
41090	R041363	191 A CLOVERDALE RD	18,848	5.5	
41062	R041324		1,030	1	
40730	R041090		6,128	2	
40131	R040448		7,009	2.25	
40132	R040449		7,009	2.25	
40719	R041077		3,505	1.25	
40199	R040505		-	1	
41042	R041305	384 1ST ST	7,246	2.25	
41053	R041312		2,143	1	
41052	R041311		7,009	2.25	
40712	R041070		7,510	2.25	
40754	R041106		2,432	1	
40708	R041066		2,444	1	
40198	R040504		18,156	5.25	
4072101	R041080		9,112	2.75	
40705	R041064		3,505	1.25	
40716	R041074		7,510	2.25	
40715	R041073		3,755	1.25	
40713	R041071		3,755	1.25	
40133	R040450	385 N 1ST ST	1,802	1	
4108701	R041360	6300 S OLD PACIFIC HWY	38,592	11.25	
40044	R040375	195 N 1ST ST	3,254	1	
40045	R040376		5,632	1.75	
40193	R040498	320 N 1ST ST	7,760	2.25	
4013701	R040452		7,009	2.25	
401330100	R052127		5,207	1.5	
401340100	R052128		5,207	1.5	
40586	R040953		-	1	
41212	R044933	1040 E FRONTAGE RD	20,203	6	
4101201	R041266		30,745	9	
41117	R041404		7,303	2.25	
40074	R040403	216 ELM ST	7,757	2.25	
40315	R040625		-	1	
40350	R040661		-	1	
40923	R041176		894	1	
410730498	R091336	110 BUTTE DR	-	1	
410730499	R091337		3,548	1.25	
40035	R040367		57,068	16.5	
412220122	R043947		-	1	
4091201	R041164		5,230	1.5	
40930	R041186	548 CHINA GARDEN RD	294,877	84.5	
41110	R041389		26,160	7.5	
411120100	R041392		19,288	5.75	

412220115	R043985		-	1	
412220128	R046939	253 KALAMA RIVER RD	292,793	83.75	
412220135	R043978	4800 S OLD PACIFIC HWY	-	1	
4032101	R040626		4,117	1.25	
4035901	R040664		10,750	3.25	
40941	R041187		-	1	
40942	R041188	620 CHINA GARDEN RD	5,467	1.75	
410120400	R041269		11,517	3.5	
40353	R040662		2,265	1	
40134	R040451	382 E FRONTAGE RD	1,802	1	
40717	R041075		5,315	1.75	
41071	R041335		209,526	60	yes
41030	R041288		150,574	43.25	yes
41118	R041405	116 WILSON DR	514,190	147	yes
40836	R041140	985 N 2ND ST	1,481,953	423.5	yes
41029	R041287	1253 N 3RD ST	981,384	280.5	yes
410560100	R041318		37,001	10.75	yes
410711	R041337		45,836	13.25	yes
41061	R041323		5,930	1.75	yes
41063	R041325		8,203	2.5	yes
410560200	R093972		74,766	21.5	yes
412640100	R043180	215 N HENDRICKSON DR	247,743	71	yes
4091201	R041164		5,230	0	yes
410560300	R043154		4,092	1.25	yes
61358	R044938		-	1	yes
410560500	R043157		72,776	21	yes
410560400	R043162		23,623	6.75	yes
41056	R041317	380 W MARINE DR	192,588	55.25	yes
41060	R041322		6,115	1.75	yes

APPENDIX E

STORMWATER UTILITY RATE MODELS

		Annual Stormwater Incr.=	2.0%					Inflation	2.00%	Residential	Growth Rate	2.0%				
Year	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Beginning fund		$ -	$ 61,548	$ 62,655	$ 87,543	$ 196,680	$ 72,262	$ 191,460	$ 87,424	$ 217,556	$ 162,291	$ 97,074	$ 245,406	$ 400,323	$ 562,106	$ 150,471
Revenue																
ERUs		2,613	2,648	2,685	2,722	2,759	2,798	2,837	2,877	2,917	2,959	3,001	3,045	3,089	3,134	3,180
Monthly Service Rate		$ 5.50	$ 5.72	$ 5.84	$ 5.95	$ 6.07	$ 6.19	$ 6.32	$ 6.44	$ 6.57	$ 6.70	$ 6.84	$ 6.98	$ 7.11	$ 7.26	$ 7.40
Total Service Rate		$ 172,458	$ 181,861	$ 188,033	$ 194,430	$ 201,062	$ 207,937	$ 215,066	$ 222,456	$ 230,120	$ 238,066	$ 246,306	$ 254,852	$ 263,715	$ 272,908	$ 282,442
Connection Fee[(1)]		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Connection Fee		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue		*$ 172,458*	*$ 181,861*	*$ 188,033*	*$ 194,430*	*$ 201,062*	*$ 207,937*	*$ 215,066*	*$ 222,456*	*$ 230,120*	*$ 238,066*	*$ 246,306*	*$ 254,852*	*$ 263,715*	*$ 272,908*	*$ 282,442*
Expenses																
Yearly O&M Salaries		$23,310	$ 23,776	$ 24,252	$ 44,820	$ 45,716	$ 46,631	$ 47,563	$ 48,515	$ 49,485	$ 50,475	$ 51,484	$ 52,514	$ 53,564	$ 54,635	$ 55,728
Yearly O&M Equipment/Rentals		$6,000	$ 6,120	$ 6,242	$ 8,000	$ 8,160	$ 8,323	$ 8,490	$ 8,659	$ 8,833	$ 9,009	$ 9,189	$ 9,373	$ 9,561	$ 9,752	$ 9,947
Total Expense		*$29,310*	*$ 29,896*	*$ 30,494*	*$ 52,820*	*$ 53,876*	*$ 54,954*	*$ 56,053*	*$ 57,174*	*$ 58,318*	*$ 59,484*	*$ 60,674*	*$ 61,887*	*$ 63,125*	*$ 64,387*	*$ 65,675*
Capital Reserve		$ 143,148	$ 213,513	$ 220,194	$ 229,153	$ 343,866	$ 225,245	$ 350,473	$ 252,706	$ 389,358	$ 340,873	$ 282,707	$ 438,371	$ 600,914	$ 770,626	$ 367,238

CIP Projects	*2018 cost*															
CIP 1 - E Frontage Road Storm Drain Cleaning	$ 115,000		$ 119,646													
CIP 2 - Ship's Watch Drainage Redirection to Spencer Creek	$ 199,000							$ 228,588								
CIP 3 - Spencer Creek Culvert Replacements	$ 216,000					$ 238,481										
CIP 4 - Juniper Street Outfall Rehabilitation	$ 440,000														$ 580,571	
CIP 5 - Ashland/Silverdust Ditch Capacity Improvement	$ 160,000									$ 191,215						
CIP 6 - S 10th Street and Birch Street Ditch Capacity Improvement	$ 170,000										$ 207,229					
CIP 7 - Stormwater Comprehensive Plan	$ 80,000			$ 84,897												
CIP 8 - Basemap Improvements	$ 50,000	$ 51,000														
CIP 9 - LID Code Updates	$ 15,000			$ 15,918												
Miscellaneous Projects/Repairs	$ 30,000	$ 30,600	$ 31,212	$ 31,836	$ 32,473	$ 33,122	$ 33,785	$ 34,461	$ 35,150	$ 35,853	$ 36,570	$ 37,301	$ 38,047	$ 38,808	$ 39,584	$ 40,376
CIP Total		**$ 81,600**	**$ 150,858**	**$ 132,651**	**$ 32,473**	**$ 271,604**	**$ 33,785**	**$ 263,049**	**$ 35,150**	**$ 227,068**	**$ 243,799**	**$ 37,301**	**$ 38,047**	**$ 38,808**	**$ 620,155**	**$ 40,376**
Year End Total		**$ 61,548**	**$ 62,655**	**$ 87,543**	**$ 196,680**	**$ 72,262**	**$ 191,460**	**$ 87,424**	**$ 217,556**	**$ 162,291**	**$ 97,074**	**$ 245,406**	**$ 400,323**	**$ 562,106**	**$ 150,471**	**$ 326,862**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

(1) The SDC has not been included in the financial analysis as a measure of conservativeness.

Scenario A: No Financing, $5.50 per ERU starting rate

		Annual Stormwater Incr.=	2.0%					Inflation	2.00%	Residential	Growth Rate	2.0%				
Year	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Beginning fund		$ -	$ 139,938	$ 124,871	$ 84,496	$ 65,551	$ 93,275	$ 114,444	$ 335,632	$ 565,738	$ 279,280	$ 528,314	$ 787,389	$ 1,056,911	$ 1,337,302	$ 1,628,999
Revenue																
ERUs		2,613	2,648	2,685	2,722	2,759	2,798	2,837	2,877	2,917	2,959	3,001	3,045	3,089	3,134	3,180
Monthly Service Rate		$ 8.00	$ 8.32	$ 8.49	$ 8.66	$ 8.83	$ 9.01	$ 9.19	$ 9.37	$ 9.56	$ 9.75	$ 9.95	$ 10.15	$ 10.35	$ 10.56	$ 10.77
Total Service Rate		$ 250,848	$ 264,525	$ 273,502	$ 282,808	$ 292,454	$ 302,454	$ 312,823	$ 323,573	$ 334,719	$ 346,278	$ 358,264	$ 370,694	$ 383,586	$ 396,956	$ 410,825
Connection Fee[(1)]		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Connection Fee		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue		*$ 250,848*	*$ 264,525*	*$ 273,502*	*$ 282,808*	*$ 292,454*	*$ 302,454*	*$ 312,823*	*$ 323,573*	*$ 334,719*	*$ 346,278*	*$ 358,264*	*$ 370,694*	*$ 383,586*	*$ 396,956*	*$ 410,825*
Expenses																
Yearly O&M Salaries		$23,310	$ 23,776	$ 44,820	$ 45,716	$ 46,631	$ 47,563	$ 48,515	$ 49,485	$ 50,475	$ 51,484	$ 52,514	$ 53,564	$ 54,635	$ 55,728	$ 56,843
Yearly O&M Equipment/Rentals		$6,000	$ 6,120	$ 8,000	$ 8,160	$ 8,323	$ 8,490	$ 8,659	$ 8,833	$ 9,009	$ 9,189	$ 9,373	$ 9,561	$ 9,752	$ 9,947	$ 10,146
Total Expense		*$29,310*	*$ 29,896*	*$ 52,820*	*$ 53,876*	*$ 54,954*	*$ 56,053*	*$ 57,174*	*$ 58,318*	*$ 59,484*	*$ 60,674*	*$ 61,887*	*$ 63,125*	*$ 64,387*	*$ 65,675*	*$ 66,989*
Capital Reserve		$ 221,538	$ 374,567	$ 345,554	$ 313,428	$ 303,051	$ 339,677	$ 370,093	$ 600,887	$ 840,973	$ 564,884	$ 824,691	$ 1,094,959	$ 1,376,110	$ 1,668,583	$ 1,972,835

CIP Projects	*2018 cost*															
CIP 1 - E Frontage Road Storm Drain Cleaning	$ 115,000		$ 119,646													
CIP 2 - Ship's Watch Drainage Redirection to Spencer Creek	$ 199,000				$ 215,404											
CIP 3 - Spencer Creek Culvert Replacements	$ 216,000			$ 229,221												
CIP 4 - Juniper Street Outfall Rehabilitation	$ 440,000									$ 525,841						
CIP 5 - Ashland/Silverdust Ditch Capacity Improvement	$ 160,000					$ 176,653										
CIP 6 - S 10th Street and Birch Street Ditch Capacity Improvement	$ 170,000						$ 191,448									
CIP 7 - Stormwater Comprehensive Plan	$ 80,000		$ 83,232													
CIP 8 - Basemap Improvements	$ 50,000	$ 51,000														
CIP 9 - LID Code Updates	$ 15,000		$ 15,606													
Miscellaneous Projects/Repairs	$ 30,000	$ 30,600	$ 31,212	$ 31,836	$ 32,473	$ 33,122	$ 33,785	$ 34,461	$ 35,150	$ 35,853	$ 36,570	$ 37,301	$ 38,047	$ 38,808	$ 39,584	$ 40,376
CIP Total		**$ 81,600**	**$ 249,696**	**$ 261,057**	**$ 247,877**	**$ 209,775**	**$ 225,232**	**$ 34,461**	**$ 35,150**	**$ 561,694**	**$ 36,570**	**$ 37,301**	**$ 38,047**	**$ 38,808**	**$ 39,584**	**$ 40,376**
Year End Total		**$ 139,938**	**$ 124,871**	**$ 84,496**	**$ 65,551**	**$ 93,275**	**$ 114,444**	**$ 335,632**	**$ 565,738**	**$ 279,280**	**$ 528,314**	**$ 787,389**	**$ 1,056,911**	**$ 1,337,302**	**$ 1,628,999**	**$ 1,932,459**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

(1) The SDC has not been included in the financial analysis as a measure of conservativeness.

Scenario B: No Financing, $8 per ERU starting rate

		Annual Stormwater Incr.=	2.0%					Inflation	2.00%	Residential	Growth Rate	2.0%	loan interest	2.0%	loan term	10
Year	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Beginning fund		$ -	$ 61,548	$ 39,246	$ 82,800	$ 124,635	$ 147,050	$ 173,611	$ 205,004	$ 184,053	$ 168,378	$ 158,212	$ 153,802	$ 155,954	$ 164,946	$ 255,536
Revenue																
ERUs		2,613	2,648	2,685	2,722	2,759	2,798	2,837	2,877	2,917	2,959	3,001	3,045	3,089	3,134	3,180
Monthly Service Rate		$ 5.50	$ 5.72	$ 5.84	$ 5.95	$ 6.07	$ 6.19	$ 6.32	$ 6.44	$ 6.57	$ 6.70	$ 6.84	$ 6.98	$ 7.11	$ 7.26	$ 7.40
Total Service Rate		$ 172,458	$ 181,861	$ 188,033	$ 194,430	$ 201,062	$ 207,937	$ 215,066	$ 222,456	$ 230,120	$ 238,066	$ 246,306	$ 254,852	$ 263,715	$ 272,908	$ 282,442
Connection Fee[(1)]		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Connection Fee		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue		*$ 172,458*	*$ 181,861*	*$ 188,033*	*$ 194,430*	*$ 201,062*	*$ 207,937*	*$ 215,066*	*$ 222,456*	*$ 230,120*	*$ 238,066*	*$ 246,306*	*$ 254,852*	*$ 263,715*	*$ 272,908*	*$ 282,442*
Expenses																
Yearly O&M Salaries		$23,310	$ 23,776	$ 44,820	$ 45,716	$ 46,631	$ 47,563	$ 48,515	$ 49,485	$ 50,475	$ 51,484	$ 52,514	$ 53,564	$ 54,635	$ 55,728	$ 56,843
Yearly O&M Equipment/Rentals		$6,000	$ 6,120	$ 8,000	$ 8,160	$ 8,323	$ 8,490	$ 8,659	$ 8,833	$ 9,009	$ 9,189	$ 9,373	$ 9,561	$ 9,752	$ 9,947	$ 10,146
Total Expense		*$29,310*	*$ 29,896*	*$ 52,820*	*$ 53,876*	*$ 54,954*	*$ 56,053*	*$ 57,174*	*$ 58,318*	*$ 59,484*	*$ 60,674*	*$ 61,887*	*$ 63,125*	*$ 64,387*	*$ 65,675*	*$ 66,989*
Capital Reserve		$ 143,148	$ 213,513	$ 174,459	$ 223,353	$ 270,743	$ 298,935	$ 331,502	$ 369,142	$ 354,689	$ 345,770	$ 342,632	$ 345,530	$ 355,282	$ 372,179	$ 470,989

CIP Projects	*2018 cost*															
CIP 1 - E Frontage Road Storm Drain Cleaning	$ 115,000		$ 59,823	$ 59,823												
CIP 2 - Ship's Watch Drainage Redirection to Spencer Creek	$ 199,000				$ 23,980	$ 23,980	$ 24,949	$ 25,448	$ 25,957	$ 26,476	$ 27,006	$ 27,546	$ 27,546	$ 27,546		
CIP 3 - Spencer Creek Culvert Replacements	$ 216,000				$ 26,029	$ 26,029	$ 26,029	$ 26,029	$ 26,029	$ 26,029	$ 26,029	$ 26,029	$ 26,029	$ 26,029		
CIP 4 - Juniper Street Outfall Rehabilitation	$ 440,000								$ 57,392	$ 57,392	$ 57,392	$ 57,392	$ 57,392	$ 57,392	$ 57,392	$ 57,392
CIP 5 - Ashland/Silverdust Ditch Capacity Improvement	$ 160,000					$ 19,666	$ 19,666	$ 19,666	$ 19,666	$ 19,666	$ 19,666	$ 19,666	$ 19,666	$ 19,666	$ 19,666	
CIP 6 - S 10th Street and Birch Street Ditch Capacity Improvement	$ 170,000					$ 20,895	$ 20,895	$ 20,895	$ 20,895	$ 20,895	$ 20,895	$ 20,895	$ 20,895	$ 20,895		
CIP 7 - Stormwater Comprehensive Plan	$ 80,000		$ 83,232													
CIP 8 - Basemap Improvements	$ 50,000	$ 51,000														
CIP 9 - LID Code Updates	$ 15,000				$ 16,236											
Miscellaneous Projects/Repairs	$ 30,000	$ 30,600	$ 31,212	$ 31,836	$ 32,473	$ 33,122	$ 33,785	$ 34,461	$ 35,150	$ 35,853	$ 36,570	$ 37,301	$ 38,047	$ 38,808	$ 39,584	$ 40,376
CIP Total		**$ 81,600**	**$ 174,267**	**$ 91,659**	**$ 98,718**	**$ 123,693**	**$ 125,324**	**$ 126,499**	**$ 185,089**	**$ 186,311**	**$ 187,558**	**$ 188,829**	**$ 189,575**	**$ 190,336**	**$ 116,643**	**$ 97,768**
Year End Total		**$ 61,548**	**$ 39,246**	**$ 82,800**	**$ 124,635**	**$ 147,050**	**$ 173,611**	**$ 205,004**	**$ 184,053**	**$ 168,378**	**$ 158,212**	**$ 153,802**	**$ 155,954**	**$ 164,946**	**$ 255,536**	**$ 373,221**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

(1) The SDC has not been included in the financial analysis as a measure of conservativeness.

Scenario C: 10-year Financing, $5.50 per ERU starting rate

		Annual Stormwater Incr.=	2.0%					Inflation	2.00%	Residential	Growth Rate	2.0%	loan interest	2.0%	loan term	10
Year	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Beginning fund		$ -	$ 49,932	$ 53,384	$ 104,609	$ 125,181	$ 152,466	$ 186,740	$ 228,289	$ 277,412	$ 334,419	$ 399,632	$ 473,389	$ 581,056	$ 760,477	$ 1,002,554
Revenue																
ERUs		2,613	2,648	2,685	2,722	2,759	2,798	2,837	2,877	2,917	2,959	3,001	3,045	3,089	3,134	3,180
Monthly Service Rate		$ 7.00	$ 7.28	$ 7.43	$ 7.58	$ 7.73	$ 7.88	$ 8.04	$ 8.20	$ 8.37	$ 8.53	$ 8.70	$ 8.88	$ 9.06	$ 9.24	$ 9.42
Total Service Rate		$ 219,492	$ 231,460	$ 239,314	$ 247,457	$ 255,897	$ 264,648	$ 273,720	$ 283,126	$ 292,879	$ 302,993	$ 313,481	$ 324,357	$ 335,637	$ 347,337	$ 359,472
Connection Fee[(1)]		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Connection Fee		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue		*$ 219,492*	*$ 231,460*	*$ 239,314*	*$ 247,457*	*$ 255,897*	*$ 264,648*	*$ 273,720*	*$ 283,126*	*$ 292,879*	*$ 302,993*	*$ 313,481*	*$ 324,357*	*$ 335,637*	*$ 347,337*	*$ 359,472*
Expenses																
Yearly O&M Salaries		$23,310	$ 23,776	$ 44,820	$ 45,716	$ 46,631	$ 47,563	$ 48,515	$ 49,485	$ 50,475	$ 51,484	$ 52,514	$ 53,564	$ 54,635	$ 55,728	$ 56,843
Yearly O&M Equipment/Rentals		$6,000	$ 6,120	$ 8,000	$ 8,160	$ 8,323	$ 8,490	$ 8,659	$ 8,833	$ 9,009	$ 9,189	$ 9,373	$ 9,561	$ 9,752	$ 9,947	$ 10,146
Total Expense		*$29,310*	*$ 29,896*	*$ 52,820*	*$ 53,876*	*$ 54,954*	*$ 56,053*	*$ 57,174*	*$ 58,318*	*$ 59,484*	*$ 60,674*	*$ 61,887*	*$ 63,125*	*$ 64,387*	*$ 65,675*	*$ 66,989*
Capital Reserve		$ 190,182	$ 251,496	$ 239,878	$ 298,190	$ 326,124	$ 361,060	$ 403,285	$ 453,097	$ 510,807	$ 576,738	$ 651,226	$ 734,622	$ 852,307	$ 1,042,139	$ 1,295,037

CIP Projects	*2018 cost*															
CIP 1 - E Frontage Road Storm Drain Cleaning	$ 115,000	$ 58,650	$ 58,650													
CIP 2 - Ship's Watch Drainage Redirection to Spencer Creek	$ 199,000			$ 23,510	$ 23,510	$ 23,510	$ 23,510	$ 23,510	$ 23,510	$ 23,510	$ 23,510	$ 23,510	$ 23,510			
CIP 3 - Spencer Creek Culvert Replacements	$ 216,000		$ 25,018	$ 25,018	$ 25,018	$ 25,018	$ 25,018	$ 25,018	$ 25,018	$ 25,018	$ 25,018	$ 25,018				
CIP 4 - Juniper Street Outfall Rehabilitation	$ 440,000				$ 53,022	$ 53,022	$ 53,022	$ 53,022	$ 53,022	$ 53,022	$ 53,022	$ 53,022	$ 53,022	$ 53,022		
CIP 5 - Ashland/Silverdust Ditch Capacity Improvement	$ 160,000			$ 18,902	$ 18,902	$ 18,902	$ 18,902	$ 18,902	$ 18,902	$ 18,902	$ 18,902	$ 18,902	$ 18,902			
CIP 6 - S 10th Street and Birch Street Ditch Capacity Improvement	$ 170,000			$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084			
CIP 7 - Stormwater Comprehensive Plan	$ 80,000		$ 83,232													
CIP 8 - Basemap Improvements	$ 50,000	$ 51,000														
CIP 9 - LID Code Updates	$ 15,000			$ 15,918												
Miscellaneous Projects/Repairs	$ 30,000	$ 30,600	$ 31,212	$ 31,836	$ 32,473	$ 33,122	$ 33,785	$ 34,461	$ 35,150	$ 35,853	$ 36,570	$ 37,301	$ 38,047	$ 38,808	$ 39,584	$ 40,376
CIP Total		**$ 140,250**	**$ 198,112**	**$ 135,269**	**$ 173,009**	**$ 173,658**	**$ 174,321**	**$ 174,996**	**$ 175,686**	**$ 176,389**	**$ 177,106**	**$ 177,837**	**$ 153,565**	**$ 91,830**	**$ 39,584**	**$ 40,376**
Year End Total		**$ 49,932**	**$ 53,384**	**$ 104,609**	**$ 125,181**	**$ 152,466**	**$ 186,740**	**$ 228,289**	**$ 277,412**	**$ 334,419**	**$ 399,632**	**$ 473,389**	**$ 581,056**	**$ 760,477**	**$ 1,002,554**	**$ 1,254,661**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

(1) The SDC has not been included in the financial analysis as a measure of conservativeness.

Scenario D: 10-year Financing, $7.00 per ERU starting rate

		Annual Stormwater Incr.=	2.0%					Inflation	2.00%	Residential	Growth Rate	2.0%	loan interest	2.0%	loan term	10
Year	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Beginning fund		$ -	$ 81,288	$ 60,618	$ 110,299	$ 167,593	$ 232,805	$ 306,257	$ 388,280	$ 479,220	$ 579,438	$ 689,307	$ 809,218	$ 1,006,674	$ 1,287,064	$ 1,578,761
Revenue																
ERUs		2,613	2,648	2,685	2,722	2,759	2,798	2,837	2,877	2,917	2,959	3,001	3,045	3,089	3,134	3,180
Monthly Service Rate		$ 8.00	$ 8.32	$ 8.49	$ 8.66	$ 8.83	$ 9.01	$ 9.19	$ 9.37	$ 9.56	$ 9.75	$ 9.95	$ 10.15	$ 10.35	$ 10.56	$ 10.77
Total Service Rate		$ 250,848	$ 264,525	$ 273,502	$ 282,808	$ 292,454	$ 302,454	$ 312,823	$ 323,573	$ 334,719	$ 346,278	$ 358,264	$ 370,694	$ 383,586	$ 396,956	$ 410,825
Connection Fee[(1)]		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Connection Fee		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue		*$ 250,848*	*$ 264,525*	*$ 273,502*	*$ 282,808*	*$ 292,454*	*$ 302,454*	*$ 312,823*	*$ 323,573*	*$ 334,719*	*$ 346,278*	*$ 358,264*	*$ 370,694*	*$ 383,586*	*$ 396,956*	*$ 410,825*
Expenses																
Yearly O&M Salaries		$23,310	$ 23,776	$ 44,820	$ 45,716	$ 46,631	$ 47,563	$ 48,515	$ 49,485	$ 50,475	$ 51,484	$ 52,514	$ 53,564	$ 54,635	$ 55,728	$ 56,843
Yearly O&M Equipment/Rentals		$6,000	$ 6,120	$ 8,000	$ 8,160	$ 8,323	$ 8,490	$ 8,659	$ 8,833	$ 9,009	$ 9,189	$ 9,373	$ 9,561	$ 9,752	$ 9,947	$ 10,146
Total Expense		*$29,310*	*$ 29,896*	*$ 52,820*	*$ 53,876*	*$ 54,954*	*$ 56,053*	*$ 57,174*	*$ 58,318*	*$ 59,484*	*$ 60,674*	*$ 61,887*	*$ 63,125*	*$ 64,387*	*$ 65,675*	*$ 66,989*
Capital Reserve		$ 221,538	$ 315,917	$ 281,301	$ 339,231	$ 405,093	$ 479,207	$ 561,905	$ 653,535	$ 754,456	$ 865,042	$ 985,684	$ 1,116,787	$ 1,325,872	$ 1,618,346	$ 1,922,598

CIP Projects	*2018 cost*															
CIP 1 - E Frontage Road Storm Drain Cleaning	$ 115,000	$ 58,650	$ 58,650													
CIP 2 - Ship's Watch Drainage Redirection to Spencer Creek	$ 199,000		$ 23,049	$ 23,049	$ 23,049	$ 23,049	$ 23,049	$ 23,049	$ 23,049	$ 23,049	$ 23,049	$ 23,049				
CIP 3 - Spencer Creek Culvert Replacements	$ 216,000		$ 25,018	$ 25,518	$ 25,518	$ 25,518	$ 25,518	$ 25,518	$ 25,518	$ 25,518	$ 25,518	$ 25,518				
CIP 4 - Juniper Street Outfall Rehabilitation	$ 440,000			$ 51,982	$ 51,982	$ 51,982	$ 51,982	$ 51,982	$ 51,982	$ 51,982	$ 51,982	$ 51,982	$ 51,982			
CIP 5 - Ashland/Silverdust Ditch Capacity Improvement	$ 160,000		$ 18,532	$ 18,532	$ 18,532	$ 18,532	$ 18,532	$ 18,532	$ 18,532	$ 18,532	$ 18,532	$ 18,532				
CIP 6 - S 10th Street and Birch Street Ditch Capacity Improvement	$ 170,000			$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084	$ 20,084			
CIP 7 - Stormwater Comprehensive Plan	$ 80,000		$ 83,232													
CIP 8 - Basemap Improvements	$ 50,000	$ 51,000														
CIP 9 - LID Code Updates	$ 15,000		$ 15,606													
Miscellaneous Projects/Repairs	$ 30,000	$ 30,600	$ 31,212	$ 31,836	$ 32,473	$ 33,122	$ 33,785	$ 34,461	$ 35,150	$ 35,853	$ 36,570	$ 37,301	$ 38,047	$ 38,808	$ 39,584	$ 40,376
CIP Total		**$ 140,250**	**$ 255,299**	**$ 171,001**	**$ 171,638**	**$ 172,287**	**$ 172,950**	**$ 173,626**	**$ 174,315**	**$ 175,018**	**$ 175,735**	**$ 176,466**	**$ 110,113**	**$ 38,808**	**$ 39,584**	**$ 40,376**
Year End Total		**$ 81,288**	**$ 60,618**	**$ 110,299**	**$ 167,593**	**$ 232,805**	**$ 306,257**	**$ 388,280**	**$ 479,220**	**$ 579,438**	**$ 689,307**	**$ 809,218**	**$ 1,006,674**	**$ 1,287,064**	**$ 1,578,761**	**$ 1,882,221**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

(1) The SDC has not been included in the financial analysis as a measure of conservativeness.

Scenario E: 10-year Financing, $8.00 per ERU starting rate

APPENDIX F

STORMWATER SYSTEM BASE MAP

MAPLE LN
HOLLY BLVD
MEEKER DR
SHIP WATCH CIR
ELLAVERY AVE
HORIZON DR
COUNCIL CREST CT
KINGWOOD ST
2ND ST
JUNIPER ST
2ND PL
3RD PL
4TH ST
5TH ST
TAYLOR RD
IVY ST
FRONTAGE RD
1ST ST
HOLLY ST
HOLLY BLVD
GERANIUM ST
3RD ST
FIR ST
4TH ST
HUCKLEBERRY LN
ELM ST
2ND ST
MARINE DR
DATE ST
MILITARY RD
8TH ST
10TH ST
DOUGLAS ST
CEDAR ST
1ST PL
3RD PL
7TH ST
11TH ST
CHINA GARDEN RD
BIRCHWOOD DR
9TH ST
BIRCH ST
ASHLAND LOOP
2ND PL
CHEHALIS ST
ASHLAND ST
BARNWELL CT
6TH ST
INTERSTATE 5 HWY
SUMMIT DR
WOODALE DR
10TH ST
ASHLAND CT
ZIESMAN CT
GRAYSTONE RD
SILVERDUST DR
CLOVERDALE RD
PARKLAND DR
OLD PACIFIC HWY
HENDRICKSON DR
STERLING STONE CT
ROCKY MEADOW DR
STONE FOREST DR
BUTTE CT
CLIFF CT
COLUMBIA RIVER

Legend

- City Limits
- Major Water Bodies

Storm Structures

- Type 1 CB
- Type 2 CB/Manhole
- Inlet
- Outfall
- Pump Manhole
- Vault
- Unknown

Storm Pipes

- <8-inch Diameter
- 8-inch Diameter
- 10-inch Diameter
- 12-inch Diameter
- 14-inch Diameter
- 15-inch Diameter
- 18-inch Diameter
- 21-inch Diameter
- 24-inch Diameter
- 36-inch Diameter
- 48-inch Diameter
- Detention Pipe
- Culvert
- Unknown Size

N W E S

0 100 200 300 400 500 1,000 Feet

CITY OF KALAMA

STORMWATER SYSTEM BASEMAP
MARCH 2018

Gray & Osborne, Inc.
CONSULTING ENGINEERS

\\goSERVER3\data1\KALAMA\18223.00 Stormwater Utility Formation\GIS\StormBasemap.mxd