CITY OF COOS BAY CITY COUNCIL
Agenda Staff Report

MEETING DATE	AGENDA ITEM NUMBER
April 16, 2013	

TO: Mayor Shoji and City Council

FROM: Jennifer Wirsing, Engineering Service Coordinator
Jim Hossley, Public Works and Development Director
Through: Rodger Craddock, City Manager REC

ISSUE: Presentation of Report Related to the Evaluation of Drainage Issues Along the Highway 101 Corridor and Downtown Area

BACKGROUND:
The City of Coos Bay's downtown area and the portion of Highway 101 that serves Coos Bay is situated adjacent to the Bay of Coos River, also referred to as Coos Bay. Stormwater collected from within this developed area is typically captured in catch basins or inlets and conveyed in pipes. The pipes ultimately discharge to the Bay. Because of recent flooding incidents that the City has experienced, City Council tasked staff with investigating the drainage issues that affect the 101 Corridor and the downtown area. Based on Council's request, staff prepared a report that compiled a list of projects in the subject area and evaluated and rated the projects. The report contains discussion regarding the preparation of the matrix utilized for the evaluation, updated cost estimates, a narrative about each project identified and analyzed, and a ranking of the projects.

ADVANTAGES:
If the Council chooses to move forward with design and construction of any of the identified projects in the report it will alleviate an area that has historically experienced flooding.

DISADVANTAGES:
Performing design and construction of any of the projects identified in the report could have significant cost implications. This report only analyzes a specific area within Coos Bay. The City's Master Plans have identified numerous other projects not located within the downtown area or the 101 corridor that may have a higher priority/ranking.

BUDGET IMPLICATIONS:
Should Council decide to move forward and further explore performing any of the projects identified in the report, Staff will need to work with a financial consultant to determine the new rate increase that is necessary to fund the new project(s).

ACTION REQUESTED:
Provide direction to Staff regarding what future actions, if any, Council would like to see Staff take. If Council decides to move forward and further evaluate a solution, a work session could be scheduled. There are many items to be considered that need to be determined prior to moving forward with a policy change. These items can include but are not limited to understanding all alternatives and options, determining the preferred altemative, and funding of the new projects (both design and construction).

ATTACHMENT
January 2013 report titled, *Evaluation of Drainage Issues Along the Highway 101 Corridor and Downtown Area for the City of Coos Bay*

Evaluation of Drainage Issues Along the Highway 101 Corridor and Downtown Area For the City of Coos Bay

January 2013

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1.0 INTRODUCTION

BACKGROUND AND NEED

The City of Coos Bay's downtown area and the portion of Highway 101 that serves Coos Bay is situated adjacent to the Bay of Coos River, also named Coos Bay (To avoid confusion with the name of the City, the bay formed by Coos River will be referred to as the "Bay" throughout this report.). Stormwater collected from within this developed area is typically captured in catch basins or inlets and conveyed in pipes. The pipes ultimately discharge to the Bay. Because of recent flooding incidents that the City has experienced, City Council tasked staff with investigating the drainage issues that affect the 101 Corridor and the downtown area. The City is steadily growing and still has viable land for development located upstream of this area. With this anticipated growth and the existing drainage issues that the 101 Corridor and the downtown area experiences, the City needs a plan to address current and future drainage issues that impact these areas.

Based on Council's request, staff compiled a list of projects in the subject area and evaluated and rated the projects. Updated cost estimates were also created for the purposes of financial planning. This document contains discussion regarding the preparation of the matrix, a narrative about each project identified and analyzed, the prioritization matrix, a ranking of the projects, and cost estimates.

PROJECT STUDY AREA

The study area focuses on the downtown area of Coos Bay and the Highway 101 Corridor. The downtown area is bounded by 7th Street to the west, the Bay to the east, Golden Avenue to the south, and Market Avenue to the north. The Highway 101 Corridor extends from the North Bend/Coos Bay city limits and continues southerly to the Fred Meyer Retail Store (Johnson Avenue).

SOURCES OF INFORMATION

In order to prioritize the drainage projects, Staff utilized several resources to create a list of drainage issues and proposed projects along the 101 Corridor. The resources included discussions with CH2M HILL-OMI (the City's operation and maintenance contractor for sanitary sewer and stormwater), discussions with the Police Department, and referencing the 2004 plan titled, *Storm Water Master Plan,* prepared by The Dyer Partnership (herein referred to as "Dyer"). The majority of the drainage issues that CH2M HILL-OMI and the Police Department identified were already identified in the 2004 Master Plan. Dyer also created a drainage analysis for the Egyptian Theatre. The purpose of the analysis was to evaluate and present viable alternatives that would reduce the impacts of flooding in front of the theatre. The findings are presented in a technical memorandum titled, *Egyptian Theatre Storm Drain Alternatives*, dated November 8, 2012. Information from the memorandum was also utilized in the preparation of this report.

With the exception of one project, only high priority projects were evaluated for the purposes of this report. High priority projects were identified as projects in areas where there is currently flooding that affects structures or the use of property, the system is significantly undersized for current design flows, or where tidegates or piping are missing or non-operable. Additionally projects were rated a high priority if the existing improvements are past their design life, showing signs of eminent failure, and the failure of these existing improvements would have significant public safety, environmental, and economic impacts. As stated previously, there is one project that was not rated a high priority. This project is titled Downtown Pump Station for Drainage Basin 11. This project is described in more detail in Section 4.0.

2.0 MATRIX AND DESIGN PARAMETERS

City Staff created a prioritization matrix to evaluate the drainage issues. The prioritization matrix was based on categories that directly affected the City. Additionally, while creating the matrix, several other parameters had to be defined. The City had to determine what was an average storm that is typical throughout the rainy season. The City also investigated the difference between storm events, flooding events, and tidal influence. This section discusses the research, findings, and conclusions that were performed in the creation of the matrix.

MATRIX PARAMETERS

Once the projects were identified an evaluation criteria had to be created. In creating the criteria several main categories were utilized. The main categories consisted of public safety impacts, economic impacts, technical criteria, environmental/ecological impacts, and other impacts. Each of these main categories had several subcategories that are discussed in more detail below.

1.0 Public Safety Impacts

1.1 Emergency vehicle access (fire, police, EMT, etc.) - Emergency service vehicles must have adequate access to all areas in the event of emergencies at, within, and through a flooding location. This access will range from general roadway access and including access to individual buildings.

1.2 Vehicular Impacts/Circulation (excluding emergency vehicles) - The school bus route needs to be free and clear. Is public's ability to enter and exit property and/or business compromised by flooding event? Is City staff's ability to exit and enter property and/or business compromised by flooding event? Is City staff's ability to assist during a flooding event compromised because property does not have ingress/egress? Does the velocity of water cause a potentially dangerous situation if a vehicle attempts to pass through?

1.3 Road delineation visibility - Making drivers aware that they are approaching an intersection, through the use of enhanced signing, delineation, and striping. Is the flooding event causing the delineation to be obscure, thus causing the road delineation to become difficult to see? Will the road delineation be compromised in a flooding event?

1.4 ADA Impacts and Special Needs
Populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintain independence, communication, transportation, supervision, and medical care. Individuals in need of additional response assistance may include those who have disabilities; who live in institutionalized settings; who are elderly; or who are transportation disadvantaged. Is flooding event impacting these needs?

2.0 Economic Impacts

2.1 Private property value impact
Property losses are partial or total. A partial loss is one that does not completely destroy the property and the property can be repaired without exceeding the policy limits or the

property value. A total loss occurs when the cost of repairing the property is more than the property's value.

2.2 Public property value impact
Property losses are partial or total. A partial loss is one that does not completely destroy the property and the property can be repaired without exceeding the policy limits or the property value. A total loss occurs when the cost of repairing the property is more than the property's value. Includes streets and public infrastructure.

2.3 Identified in Master Plan
Master plans are prepared by qualified professionals for municipalities and agencies. These plans assist City elected officials and staff in identifying and prioritizing projects that need repair. Additionally the plan presents costs estimates for the project. The cost estimates help with the financial planning to construct the project.

2.4 Enhance growth/development
The City of Coos Bay encourages growth and development within Coos Bay. As such, the City looks for projects that will meet this goal. Does this project meet this goal?

3.0 Technical Criteria

3.1 Frequency of drainage problem occurrence
The frequency in which a drainage issue occurs is significant. If a drainage issue is reoccurring, this should be documented. The documentation should include the status of the tide, the amount of rain occurring in the storm event and other pertinent factors.

3.2 Intensity of flooding caused by average storm
The intensity of a storm is significant. If a drainage issue is occurring, the intensity of a storm and the precipitation should be recorded. This information will help correlate the capacity of the existing drainage improvements (if any) and provide staff with pertinent information related to the level of protection that the drainage improvement provides. Also note if flooding is occurring at High Tides.

3.3 Design standards
Safety can be defined to be the control of recognized hazards to achieve an acceptable level of risk. This can take the form of being protected from the event or from exposure to something that cause physical or economic losses. Can project be designed to meet minimum City's design standards?

3.4 Complexity of solution
Is project solution isolated to a single location or will it involve a regional approach? Will solution involve coordination with other jurisdictions/agencies? For example will solution impact the railroad (Port) or the Levee (Port and Army Corps of Engineers) or DEQ? Will the project be completed in a timely manner or will the project require several months or a year to complete? The duration of design along with construction should be considered in this timeline.

3.5 Site accessibility (easements, permission to access)
Can project be constructed in public right of way? Will a temporary and/or permanent easement be required from private property owners and/or other agencies?

4.0 Environmental/Ecological Impacts

4.1 Habitat impacts from drainage problem
Does drainage issue impact habitat when flooding occurs? Is there endangered species identified?

4.2 Habitat impacts from proposed drainage improvements
Will proposed solution impact habitat during construction? After construction? Is there endangered species identified?

4.3 Permitting
Is there an opportunity to partner with another agency on project? Will resource agency permitting be required for drainage solution?

5.0 Other Impacts

5.1 Agency Impacts - Port of Coos Bay
Projects may require coordination with other jurisdictions and/or agencies. This coordination can extend a project timeline and also add another level of complexity to the project. However, this coordination can also lead to an opportunity to partner.

5.2 Agency Impacts - Oregon Department of Transportation (ODOT)
Projects may require coordination with other jurisdictions and/or agencies. This coordination can extend a project timeline and also add another level of complexity to the project. However, this coordination can also lead to an opportunity to partner.

5.3 Agency Impacts - North Bend
Projects may require coordination with other jurisdictions and/or agencies. This coordination can extend a project timeline and also add another level of complexity to the project. However, this coordination can also lead to an opportunity to partner.

5.4 Access to recreation facilities (e.g. Boardwalk, Museum etc.)
Is access blocked to recreational facilities during a flooding event? Is this blockage extended past the flooding event due to maintenance and repair? Is this flooding having long term adverse impacts to facility?

Once the categories and sub categories were created and defined, evaluation criteria was created and a scoring system was assigned. For the purposes of this study, the projects were prioritized based on high score. In other words, the higher the score a project received indicated that the project was more important and/or higher ranked.

Each subcategory has a maximum of 3 points that can be assigned. However all the categories are not rated equal. It is important to understand that there are certain categories that must be weighted higher than other categories. For instance, public safety should be the City's priority concern and should not be weighted as equally as economic impacts. Attachment A contains the prioritization criteria that define the categories, subcategories, and the evaluation criteria (scoring system). The following table presents the values that were assigned to the major categories and the weighted values:

TABLE 1
SUMMARY OF RANKING VALUES FOR THE MAJOR CATEGORIES

Category	Weighted Percentage	Maximum Value	Maximum Weighted Value
1.0 Public Safety Impacts	30%	12	18.9
2.0 Economic Impacts	20%	12	12.6
3.0 Technical Criteria	20%	15	12.6
4.0 Environmental/Ecological Impacts	20%	9	12.6
5.0 Other Impacts	10%	12	6.3
Total	**100%**	**60**	**60**

AVERAGE STORM

For the purposes of this prioritization matrix, in order to evaluate each project and assign values for each subcategory, it was assumed that flooding was occurring during an "average storm". With that said, the task of defining an average storm was undertaken. Research regarding the National Oceanic and Atmosphere Administration (NOAA) precipitation maps were obtained along with historic precipitation records. The following table presents the 24 hour precipitation values from the NOAA maps:

TABLE 2
SUMMARY OF 24-HOUR PRECIPITATION

Storm Event	Precipitation (inches)
2-Year, 24-hour	3.75
5-Year, 24-Hour	4.50
10-Year, 24 Hour	4.70
25-Year, 24 Hour	5.75
50-Year, 24 Hour	6.40
100-Year, 24 Hour	6.75

The historic precipitation data was obtained for years 2007 through 2012. The information obtained was recorded by the weather station located at the North Bend Airport. Interesting to note, is that over the last 6 years, there is not a recorded storm event that meets or exceeds 2-year, 24 hour levels. The following table summarizes the historic precipitation data:

TABLE 3
HISTORIC PRECIPITATION DATA

Year	Total Annual Rainfall (inches)	Number of Storms Greater than 1- inch	Highest Precipitation[1]	
			Inches	Date
2012	54.1	12	2.5	December 20, 2012
2011	40.1	5	1.7	February 28, 2011
2010	-Data Was Not Complete[2]-			
2009	47.4	4	1.5	December 15, 2009
2008	52.1	8	1.8	January 26, 2008
2007	54.7	10	3.1	November 18, 2007

(1) 2 Year, 24 Hour Storm = 3.75 inches
(2)The information that obtained for 2010 appeared to be erroneous. As such the data was not utilized.

Looking at the total average annual rainfall for the last 6 years, on average, the City receives 49.7 inches of rainfall annual. Additionally, based on the NOAA maps and the historic precipitation data that was compiled, it appears that the City on average receives storms that generate less than 1-inch of rainfall. As you can see from the above table there were a number of storms that did exceed 1-inch however they did not exceed the 2-year, 24-hour levels (3.75 inches). For the purposes of evaluating the projects, it was assumed that flooding was occurring for storm events that were less than a 2-year, 24-hour storm because that is what this area typically experiences.

To put it into perspective, on Thursday December 20, 2012 the City experienced a storm event. In total, 2.5 inches of rainfall occurred in a 24 hour period. The runoff from the storm overtaxed the storm drain system throughout the 101 corridor and downtown area. There were several locations that experienced flooding. Highway 101 northbound was closed to cars and small trucks. This traffic was re-routed through side streets and caused significant delays. Also, due to inflow and infiltration, several sanitary sewer pump stations experienced significant flows and two separate sewer spills occurred as a result. Even though the flooding seemed significant, that storm was less than a 2-year storm event. However, the peak of the storm occurred around high tide, however the tide was not abnormally high that day. The high tide occurred at 7:00 am and was 5.4 feet.

STORM EVENT, RIVER FLOODING EVENT, AND TIDAL INFLUENCES

There are many factors that can affect flooding in the City. These factors involve the time and quantity of a storm event, saturation of the ground, river flooding, and tidal influences. As stated previously, the storm drain system that serves the downtown area and Highway 101 capture runoff in catch basins and culverts and ultimately convey the runoff to the Bay. The majority of the outfalls at the Bay have tidegates, however some of the tidegates are in need of repair. The tidegates, if operating properly, will prevent the Bay water from backing into the system, however if the system is at capacity and an intense storm is occurring there still could be flooding. The outfalls and tidegates cannot relieve the water into the storm drain system until the water in the bay lowers or recedes. The following text discusses the factors that influence the total water level in the Bay.

Storm events occur frequently in our area. On average the city receives approximately 64 inches a year. When a storm occurs there are several factors that can affect flooding. If the ground is dry, infiltration will occur and the runoff from the storm will be less. If the same volume of storm occurred again, but the ground is saturated then the runoff from the storm will be greater. The amount of runoff that a storm generates can impact flooding.

When storm events occur and cause river levels to rise, this is referred to as river flooding. Several rivers empty into the Bay which can raise levels in the Bay. All of the storm drain systems in and around the downtown area and Highway 101 empty into the Bay. Higher water levels in the Bay will not allow storm drain systems to empty into the Bay until the water recedes. This can also impact flooding.

In addition, the Bay is also subject to tidal influences. The Bay's water level rises and lowers as the tide comes in and goes out. If there is a storm event and/or river flooding during a high tide, this will also impact the storm drain system and thus impact flooding in Coos Bay. The following equation sums up the factors that can affect the overall water level in the Bay:

Total Water Level = Storm Event + Rivers (River Flooding) + Tides + Other Factors
(Other factors can include wind, waves, sea level rise, etc.)

3.0 PROJECTS

In total 4 high priority projects were identified in the Dyer master plan along the Highway 101 corridor and downtown area. Additionally, Council requested that the analysis also include the project that addresses flooding at the Egyptian Theatre. As a result 5 projects were analyzed. The projects are located in several drainage basins throughout the study area. Refer to Attachment B for the exhibit titled, *Study Area Boundary & Basin Map*, obtained from the 2004 Master Plan. This exhibit provides the location of the individual drainage basins within the study area. The projects are described in detail in the following text

ALDER OUTFALL

This outfall is located in Drainage Basin 9. Drainage Basin 9 is 14.4 acres. The basin is an "L" shaped basin. The boundary starts at Date Avenue and N. 2nd Street and continues south, following N 2nd Street, to Park Avenue. At Park Avenue the boundary jogs east to Broadway and then south again to Highland Avenue, following Highland Avenue to the Bay. The existing land use is comprised of 2.4 acres of commercial land, 11 acres of industrial land, and 1 acre of residential land. Runoff associated with this drainage basin is collected along roadways and gutters, captured by catch basins and then conveyed in an 8 inch diameter pipe located along Alder avenue. The storm drain pipe ultimately outfalls into the Bay. There is no tidegate installed at this outfall.

The project proposes to upsize approximate 550 feet of 8 inch pipe to a 12 inch pipe to increase the capacity and meet 50-year design levels. The project also encompasses installing a tidegate at the outfall. Based on current land use, this drainage basin is built out and there is no future development predicted for this basin.

The Alder Outfall project has been identified in the 2004 Master Plan as a high priority project because of the undersized pipe and the lack of tidegate at the outfall. This project will require significant Resource Agency permitting due to the levee and outfall. Additionally, permitting will be required through Oregon Department of Transportation (ODOT) Rail. Total Approximate Cost for Project: $671,679. A Detailed cost estimate is located in Attachment C.

PUMP STATION 11 UPGRADE

The existing pump station 11 is located in Drainage Basin 10A. Drainage Basin 10A is 14.4 acres. The basin is bounded to the north by portions of Highland and Commercial Avenues, bounded to the south by portions of Commercial and Anderson Avenues, bounded to the west by N. 5th Street, and bounded to the east by the Bay. During high tides, the pump station not only serves Drainage Basin 10A but also Drainage Basin 12B, which is located immediately to the south. Currently, Drainage Basin 10A is comprised solely of commercial land. In 1969 a storm water pump station was constructed to serve the areas between 2nd and 4th Streets and Commercial and Curtis Avenues. The pump station helps alleviate flooding in this downtown commercial area. However, due to the age of this facility, it is extremely difficult and costly to obtain replacement parts for the pumps and controls that serve the station. Typically pump stations are designed for a life of 20 years. However, this facility is over 40 years old. If this pump station should fail it would cause significant damage to the commercial buildings in the vicinity. Additionally, if failure were to occur, the drainage could not be diverted from Basin 12B and thus overtax the existing drainage improvements and cause flooding in the 101 Corridor. In assessing a ranking for the project it was assumed that the pump station had failed.

The Pump Station 11 Upgrade project has been identified in the 2004 Master Plan as a high priority project. This project will not require Resource Agency permitting, other than the typical

DEQ permits. Total Approximate Cost for Project: $373,609. A Detailed cost estimate is located in Attachment C.

DRAINAGE BASIN 11 INTERCEPTOR

This project is identified as the Egyptian Theatre Interceptor in the 2001 Master Plan, however to avoid confusion with the flooding that is occurring in front of the theatre, this project name has been changed. Drainage Basin 11 is 7.7 acres and currently consists of 6.19 acres of Commercial land and 1.51 acres of Industrial land. There are several locations throughout this basin, along the 101 Corridor, including the area immediately in front of the Egyptian Theatre that is subject to flooding. However, since the theatre is at the low point within this drainage basin the flooding typically only occurs at that location. The storm drain basin is estimated to be older than 50 years, has significant deficiencies, and is past its design life. This project includes replacing 660 feet of storm drain line along Broadway between Curtis and Commercial Avenues, replacing 315 feet of 18 inch storm drain along Central, and replacing the outfall and tidegate at the Bay. The Master Plan has identified the outfall and tidegate that serves this system as being deficient and in need of repair. There are holes in the outfall that allow water to enter the system. Additionally, the tidegate is past its design life and should be replaced. This project will not remove the flooding occurring immediately in front of the Egyptian Theatre, however there is a potential to alleviate the flooding if the project is constructed.

The Drainage Basin 11 Interceptor project has been identified in the 2004 Master Plan as a high priority project. This project will require significant Resource Agency permitting due to the levee and outfall. Additionally, permitting will be required through ODOT Rail. Total Approximate Cost for Project: $958,606. A Detailed cost estimate is located in Attachment C.

DOWNTOWN PUMP STATION FOR DRAINAGE BASIN 11

This project is also located in Drainage Basin 11. This project was identified by the Dyer Partnership and presented in the memorandum that addressed the flooding in front of the Egyptian Theatre. It should be noted that this project also proposes to replace the outfall and tidegate associated with drainage Basin 11.

This project includes the installation of a new regional pump station with associated piping and manholes from the catch basin in front of the Egyptian Theatre to the pump station, and replacement of the existing Basin No. 11 outfall pipe and tidegate. The pump station reduces flooding within Drainage Basin and the area in front of the Egyptian Theatre.

The pump station would only pump when high water was detected within the system. During periods of high rainfall and low tides, the system would operate as a gravity flow system. A new manhole or vault would be installed to accommodate the gravity storm drain line and the new pump station force main. A check valve would be installed on the gravity system to prevent short circuiting of the storm drain system when the pump station was in operation. Replacement of the existing outfall would also be conducted and would include a new tidegate on the outfall to prevent debris from entering the system and clogging the outfall manhole.

It should be noted that if this project is constructed, flooding may occur if it is determined that a surrounding storm water basin surcharges into Basin No. 11, or if the existing storm water piping in Basin No. 11 is overtaxed by an intense storm and high tide.

The Downtown Pump Station for Drainage Basin 11 project was identified in the 2004 Master Plan, however was not a recommended project. The plan did recognize that there was flooding in from of the Egyptian Theatre, however it also recognized that the only solution would be to

pump the water and, per the plan, since this solution only served one building, it was deemed not cost effective.

The Downtown Pump Station for Drainage Basin 11 project will require significant planning. Portions of the existing storm drain conveyance system and outfall piping are located under concrete sidewalks and artwork adjacent to the new City of Coos Bay Visitors Center. These lines may require replacement or relocation. This project will require significant Resource Agency permitting due to the levee and outfall. Additionally, permitting will be required through ODOT Rail. Total Approximate Cost for Project: $2,431,791. A Detailed cost estimate is located in Attachment C.

GOLDEN PUMP STATION AND INTERCEPTORS

This project is located in Drainage Basin 14. Drainage Basin 14 is 124 acres and is currently comprised of 36 acres of commercial land, 7 acres of industrial land, 33 acres of residential land, 27 acres of forest, and 21 acres of Grassy Fields. Approximately 27 acres of land that is currently forest land is zoned for residential development. Currently there is an existing outfall to the Bay, with a tidegate, at Golden Avenue. However, due to the low elevation in this basin, it is not feasible to have a gravity flow system during a rainfall event coinciding with a high tide. As a result sections of Highway 101 and 2nd Street, south of Golden Avenue, have a tendency to flood during intense storm events that occurs during a high tide. This project consists of constructing a pump station to pump the runoff when flooding occurs. The pump station will have a new outfall and tidegate as well. Additionally, the project also includes construction of 1,150 feet of new storm drain that will redirect flows to the new pump station.

The Golden Pump Station and Interceptors project has been identified in the 2004 Master Plan as a high priority project. This project will require significant Resource Agency permitting due to the levee and outfall. Additionally, permitting will be required through ODOT Rail. Total Approximate Cost for Project: $3,204,666. A Detailed cost estimate is located in Attachment C.

4.0 PRIORITIZATION RESULTS

Each project identified in Section 4.0 was inserted into the Prioritization Matrix and each project was rated against the same categories and subcategories as described in Section 3.0. The detailed results of the project evaluations are located in Attachment D. The results have been summarized below:

Table 4
Summary of Prioritization Results

Project	Total Value	Weighted Value	Ranking	Cost Estimate
Drainage Basin 11 Interceptor	48	54.4	1	$958,606
Pump Station 11 Upgrade	37	41.2	2	$373,609
Golden Pump Station & Interceptors	35	38.5	3	$3,204,666
Alder Outfall	31	29.6	4	$671,679
Downtown Pump Station for Drainage Basin 11	27	26.6	5	$2,431,791
			Total	**$7,640,351**

It is difficult to rate projects with a priority status. When we consider prioritization there are many questions that should be considered and answered:

1. Is there deficiency that could result in total failure causing significant damage to public and/or private property? Could the failure affect public safety?
2. What is the availability and source of funding?
3. Does the project require agency coordination and permitting?
4. Does project enhance/impact development?

With these questions in mind, it should be determined if these five identified projects should be further evaluated. Additionally, should the City perform all the projects, only a portion of the project(s), or none of them? The maximum number of points is 63. The ranking of the five projects were not affected by the weighted value of the categories. However, based on the weighted values, two projects fell below the 50th percentile; Alder Outfall and Downtown Pump station for Drainage Basin 11. The next step is to determine what, if any, of the projects evaluated should be pursued further.

5.0 ADDITIONAL CONSIDERATIONS

This section deals with additional considerations that should be taken into account prior to making any significant decisions. There are many issues to address when taking on a task such as this. Often times the task can evolve into a completely different project. In creating this prioritization matrix and report several items were brought to Staff's attention that was not necessarily considered at the beginning of this project. The items have been discussed in further detail in this section for the reader's consideration.

HIGH PRIORITY PROJECTS THAT WERE NOT ANALYZED

It should be noted that there are numerous other projects and/or drainage issues that will also, at some time, need to be addressed. The City relies on two planning documents for storm Water. The 2004 Master Plan, prepared by Dyer, only addresses the drainage basins tributary to highway 101 and the drainage basins tributary to Coalbank Slough. The other planning document is also titled, Stomwater Master Plan, however it was prepared by HBH Consulting Engineers in March 2006 and covers the remainder portions of Coos Bay. The March 2006 report has $1 million worth of high priority projects. In fact the 2004 Dyer Master Plan identified approximately $8.3 million of high priority projects. Of which, $2.1 million worth of projects have been analyzed in this report because they fell within the study area. In total, only approximate 20% of the projects identified in both reports as high priority are analyzed in this plan. Please note that these dollar amounts reflect the current economic condition at the time the reports were generated and do not include inflation or resource agency permitting.

OTHER PRIORITY PROJECTS THAT WERE NOT ANALYZED

There are many other projects, other than the high priority projects, that were identified in both Master Plans. Because a project was not deemed a "high priority" does not mean that it should be discounted. For the purposes of this type of planning documents, there has to be some order set. If the other projects in the plans are not addressed, at some point they will become an issue and in all likelihood the issue will be larger than what was originally identified. In total, there are an additional $6.8 million worth of projects that are identified in addition to the $9.3 million worth of high priority projects. These dollar amounts do not include environmental and agency processing and they do not reflect any inflation. As such in all likelihood their total amount could increase by up to 50% and those numbers will most likely increase annually as the maintenance is deferred.

MITIGATION FOR DEFERRED MAINTENANCE

Deferred maintenance is the practice of postponing maintenance activities in order to save costs, meet budget funding levels, staffing limitations, or realign available budget monies. The concern with deferred maintenance is that while it may not have long term consequences in some cases because it will be attended to eventually, it can increase the risk of creating a safety hazard, a breakdown, or another problem which could cause a significant increase in costs. Unfortunately the City has deferred maintenance on portions of its storm water system. While it is admirable that the Council is seeking information regarding drainage issues along the 101 Corridor and the downtown area, additional information should be provided city wide. The City is taking on an aggressive project that consists of over $75 million in waste water projects. This huge undertaking is occurring because of deferred maintenance on our waste water system. With that in mind, if deferred maintenance continues to occur on the storm water system, the City will be facing the same situation as they are currently experiencing with wastewater.

Our stormwater system is an asset to the City of Coos Bay. Like a car, if care and maintenance is not taken, the life can be significantly shortened. Because of the intense rains and the

amount of rain that our area receives, the storm drain system is heavily used and needs to be in good working order. Additionally, age, the harsh environmental conditions, salt water intrusion, and high groundwater also contribute to the deterioration of the system. The City has two storm water master plans that together have analyzed the entire city limits. The plans have identified projects and provided preliminary cost estimates. With this information, the City could start implementing these plans today. However if deferred maintenance is continued, the projects identified in the plans can double or triple in cost.

RISK TOLERANCE VS. RISK CAPACITY

When determining the path that the City should take to address the drainage issues, it is important to balance the City's **risk tolerance** with the City's **risk capacity**. As similar as these terms sound, they're actually quite different. The term 'risk' refers to the probability that an action or event will negatively or positively impact your ability to achieve your objectives. Most commonly, this term is associated with negative impacts, however this is not necessarily a negative term. In mathematical terms, risk is defined as the probability of an event occurring times the impact of that event occurring. Risk tolerance reflects your *attitude* toward risk. Are you comfortable with the City's storm drain infrastructure? Are there certain projects that might affect that comfort level? Depending on the answer to these questions there could be positive or adverse risk tolerances.

Unlike risk tolerance, which essentially reflects the amount of risk that you *want* to take, risk capacity reflects the amount of risk that you *need* to take in order to reach your goals. In other words, what does the City need to do in order to protect their storm water assets? Conversely, if failure of a system occurs, and an emergency project must be performed how big of a project could the City withstand? Would the emergency project preclude the City from performing scheduled projects, thus causing more deferred maintenance?

FUNDING

Typically the types of stormwater projects identified in this report are funded by wastewater revenue. However due to the size and cost of all these projects and the deferred maintenance, it may not be possible to budget for these projects in addition to the other projects that the City is currently planning for (wastewater, street, park, etc.). A loan may have to be obtained, similar to the loan that the City recently received to perform a portion of the wastewater projects associated with the $75 million 20 year project discussed previously. Regardless of the funding, the rate payers will be affected. Once the Council has provided direction to staff regarding what projects, if any, should be performed it is recommended that Council request that the City's financial consultant review the budgetary numbers and determine the rate increase that will be required in order to perform the selected projects.

LEVEE

The downtown area is protected by a levee system. The levee system runs north to south and is located between Highway 101 and the bay. A levee can also be referred to as a dike, embankment, floodbank or stopbank. Levees are elongated and artificially constructed although some levels are naturally occurring. However in the case of the levee that protects the downtown area, the levee is artificially constructed of earthen fill. The main purposes of the artificial levee is to prevent flooding of the downtown area.

Artificial levees require substantial engineering and their surface must be protected from erosion. The effects of erosion are countered by planting suitable vegetation or installing stones, boulders, weighted matting or concrete revetments. Typically levees are designed to protect against a 100 year storm event. Additionally, levees require freeboard. Freeboard is the

distance between the water level of the bay and the top of the levee. The freeboard requirement can be dictated by local, state, or even federal requirements. Because a levee is only as strong as its weakest point, the height and standards of construction have to be consistent along its length. Based on a recent survey, the top of levee, adjacent to the downtown area, was recently surveyed. It was discovered that the top of the levee is at an elevation of 12.15 feet. Per the Federal Emergency Management Agency (FEMA) floodplain maps the following water surface elevations for the 100 year and 50 year storm are 12.6 and 12.3 feet, respectively. Based on this information, the levee does not have flood protection for a 50-year storm or greater.

Additional items that also need to be considered is that the levee system is old. There are signs of erosion and there are areas where the freeboard requirements are not met. To add another layer of complexity, the City only owns a small portion of the levee system, the majority of the levee is owned by the Port of Coos Bay.

In conclusion, if the levee is overtopped and if drainage improvements are constructed in the downtown area and 101 corridor the drainage improvements will not be able to handle the additional flow nor will the drainage improvements be able to prevent flooding.

ATTACHMENT A

PRIORITIZATION CRITERIA

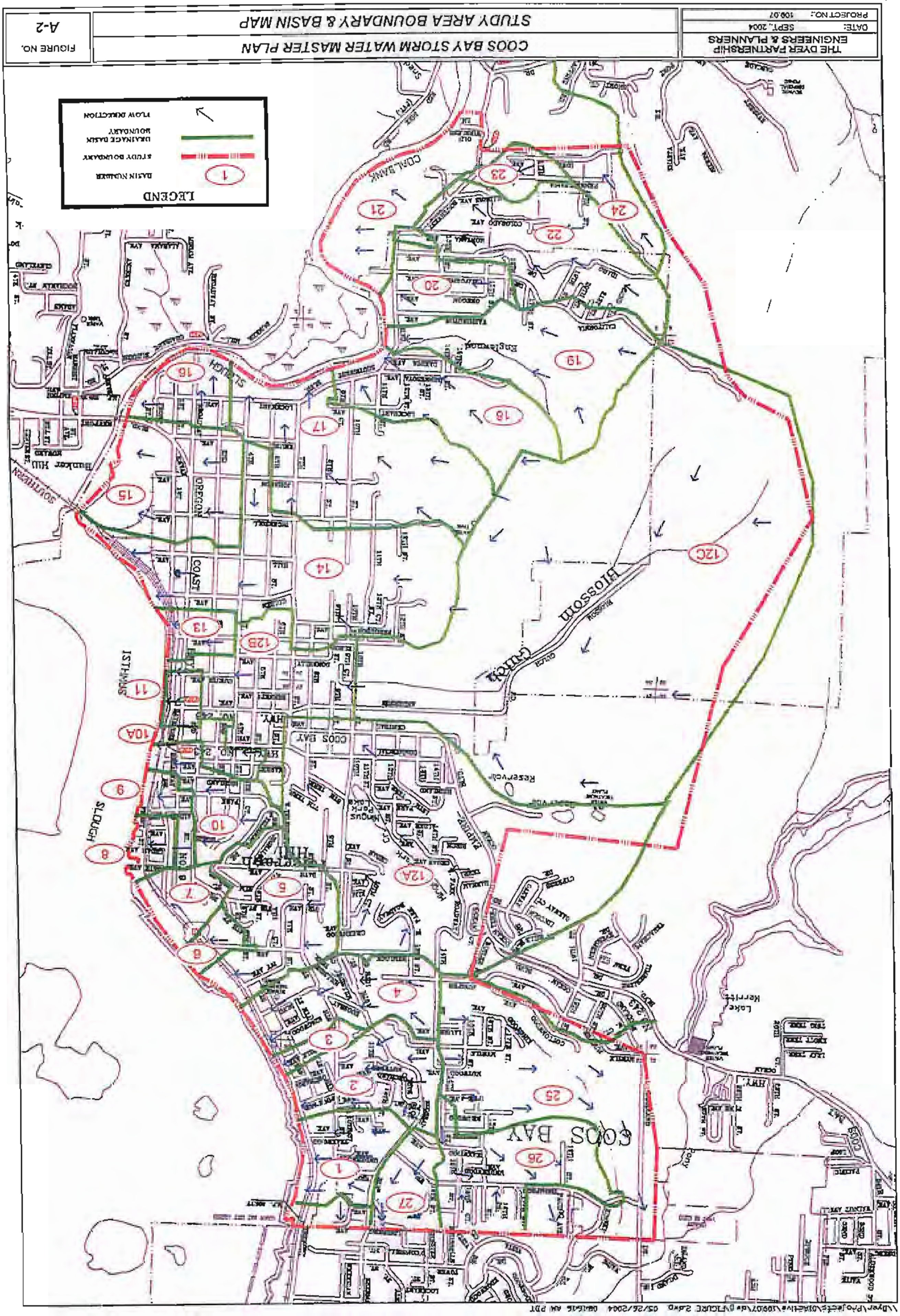
Category	General Description	Score	Evaluation Criteria
1.1 Emergency Vehicle (fire, police, EMT) access	Emergency service vehicles must have adequate access to all areas in the event of emergencies at, within, and through a flooding location. This access will range from general roadway access and including access to individual buildings.	3	Unable to access
		2	Able to access, but not directly causing significant delay
		1	Able to access, but not directly, delay is minor
		0	Able to access
1.2 Vehicular Impacts/Circulation (excluding emergency vehicles)	The school bus route needs to be free and clear. Is public's ability to enter and exit property and/or business compromised by flooding event? Is City staff's ability to exit and enter property and/or business compromised by flooding event? Is City staff's ability to assist during a flooding event compromised because property does not have ingress/egress? Does the velocity of water cause a potentially dangerous situation if a vehicle attempts to pass through?	3	Unable to access
		2	Able to access, but not directly causing significant delay
		1	Able to access, but not directly, delay is minor
		0	Able to access
1.3 Road delineation visibility	Making drivers aware that they are approaching an intersection, through the use of enhanced signing, delineation, and striping. Is the flooding event causing the delineation to be obscure, thus causing the road delineation to become difficult to see? Will the road delineation be compromised in a flooding event?	3	No road visible
		2	Road visible but significantly obscured
		1	Road visible but moderately obscured
		0	Road fully visible
1.4 ADA Impacts and Special Needs	Populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintain independence, communication, transportation, supervision, and medical care. Individuals in need of additional response assistance may include those who have disabilities; who live in institutionalized settings; who are elderly; or who are transportation disadvantaged. Is flooding event impacting these needs?	3	Significantly impacts
		2	Moderately impacts
		1	Minor impacts
		0	No impacts
2.1 Private property value impact	Property losses are partial or total. A partial loss is one that does not completely destroy the property and the property can be repaired without exceeding the policy limits or the property value. A total loss occurs when the cost of repairing the property is more than the property's value.	3	Complete loss of property
		2	Significant loss of property
		1	Minor loss of property
		0	No impact
2.2 Public property value impact	Property losses are partial or total. A partial loss is one that does not completely destroy the property and the property can be repaired without exceeding the policy limits or the property value. A total loss occurs when the cost of repairing the property is more than the property's value. Includes streets and public infrastructure.	3	Complete loss of property
		2	Significant financial damage
		1	Minor financial damage
		0	No impact
2.3 Identified in Master Plan	Master plans are prepared by qualified professionals for municipalities and agencies. These plans assist staff in identifying and prioritizing projects that need repair. Additionally the plan presents costs estimates for the project. The cost estimates help with the financial planning to construct the project.	3	Identified in Master Plan as a high priority project
		2	Identified in Master Plan as a low priority project
		1	Identified in Master Plan but not recommended
		0	Not identified in Master Plan

Category	General Description	Score	Evaluation Criteria
2.4 Enhance growth/development	The City of Coos Bay encourages growth and development within Coos Bay. As such, the City looks for projects that will meet this goal. Does this project meet this goal?	3	Project will enhance growth/development
		2	Project will have growth/development benefits
		1	Project will have minor positive impacts to growth/dev.
		0	Has not growth/development impacts
3.1 Frequency of drainage problem occurrence	The frequency in which a drainage issue occurs is significant. If a drainage issue is reoccurring, this should be documented. The documentation should include the status of the tide, the amount of rain occurring in the storm event and other pertinent factors.	3	3 or more times per year
		2	2 times per year
		1	Once a year
		0	Occurs every other year or less
3.2 Intensity of flooding caused by average storm	The intensity of a storm is significant. If a drainage issue is occurring, the intensity of a storm and the precipitation should be recorded. This information will help correlate the capacity of the existing drainage improvements (if any) and provide staff with pertinent information related to the level of protection that the drainage improvement provides. Also note if flooding is occurring at High Tides.	3	Flooding is widespread
		2	Flooding occurs at several locations throughout basin
		1	Flooding is isolated
		0	Flooding occurs during high tides (no storm event)
3.3 Design standards	Safety can be defined to be the control of recognized hazards to achieve an acceptable level of risk. This can take the form of being protected from the event or from exposure to something that cause physical or economical losses. Can project be designed to meet minimum City's design standards?	3	Currently not being met
		2	Existing improvements meets a small portion of the standards
		1	Existing improvements meets the majority of the standards
		0	Currently being met
3.4 Complexity of solution	Is project solution isolated to a single location or will it involve a regional approach? Will solution involve coordination with other jurisdictions/agencies? For example will solution impact the railroad (Port) or the Levee (Port and Army Corps of Engineers) or DEQ? Will the project be completed in a timely manner or will the project require several months or a year to complete? The duration of design along with construction should be considered in this timeline.	3	Complexity is not an issue with this project
		2	Minor complexity
		1	Moderate complexity
		0	Significant complexity
3.5 Site accessibility (easements, permission to access)	Can project be constructed in public right of way? Will a temporary and/or permanent easement be required from private property owners and/or other agencies?	3	Project site is within right of way
		2	Project site requires easements and considered a minor task
		1	Project site requires easements and considered a major task
		0	Access denied
4.1 Habitat impacts from drainage problem	Does drainage issue impact habitat when flooding occurs? Is there endangered species identified?	3	Habitat is significantly impacted
		2	Habitat is moderately impacted
		1	Habitat has only minor impacts
		0	No habitat is impacted

Category	General Description	Score	Evaluation Criteria
4.2 Habitat impacts from proposed drainage improvements	Will proposed solution impact habitat during construction? After construction? Is there endangered species identified?	3	Project has positive impact
		2	No adverse impact
		1	Habitat has only minor impacts
		0	Habitat is significantly impacted
4.3 Permitting	Is there an opportunity to partner with another agency on project? Will resource agency permitting be required for drainage solution?	3	No permits required (other than DEQ)
		2	Permits required, however considered minor
		1	Permits required, however considered major
		0	Permitting not viable
5.1 Agency Impacts - Port of Coos Bay	Projects may require coordination with other jurisdictions and/or agencies. This coordination can extend a project timeline and also add another level of complexity to the project. However, this coordination can also lead to an opportunity to partner.	3	No project coordination is required
		2	Project coordination is required but considered minor
		1	Project coordination is required and considered major
		0	Significant project coordination is required
5.2 Agency Impacts - Oregon Department of Transportation (ODOT)	Projects may require coordination with other jurisdictions and/or agencies. This coordination can extend a project timeline and also add another level of complexity to the project. However, this coordination can also lead to an opportunity to partner.	3	No project coordination is required
		2	Project coordination is required but considered minor
		1	Project coordination is required and considered major
		0	Significant project coordination is required
5.3 Agency Impacts - ODOT Rail	Projects may require coordination with other jurisdictions and/or agencies. This coordination can extend a project timeline and also add another level of complexity to the project. However, this coordination can also lead to an opportunity to partner.	3	No project coordination is required
		2	Project coordination is required but considered minor
		1	Project coordination is required and considered major
		0	Significant project coordination is required
5.4 Agency Impacts - North Bend	Projects may require coordination with other jurisdictions and/or agencies. This coordination can extend a project timeline and also add another level of complexity to the project. However, this coordination can also lead to an opportunity to partner.	3	No project coordination is required
		2	Project coordination is required but considered minor
		1	Project coordination is required and considered major
		0	Significant project coordination is required
5.5 Access to recreation facilities (e.g. Boardwalk, Museum etc.)	Is access blocked to recreational facilities during a flooding event? Is this blockage extended past the flooding event due to maintenance and repair? Is this flooding having long term adverse impacts to facility?	3	Flooding is having long term adverse impacts
		2	maintenance and/or repair is required after flooding
		1	Facility is accessible after storm event
		0	Not flooded during storm event

ATTACHMENT B

STUDY AREA BOUNDARY & BASIN MAP


COOS BAY STORM WATER MASTER PLAN
STUDY AREA BOUNDARY & BASIN MAP
FIGURE NO.
A-2
THE DYER PARTNERSHIP
ENGINEERS & PLANNERS
DATE: SEPT., 2004
PROJECT NO.: 100.07
LEGEND
BASIN NUMBER
STUDY BOUNDARY
DRAINAGE BASIN BOUNDARY
FLOW DIRECTION

ATTACHMENT C

COST ESTIMATES

City of Coos Bay
Downtown Pump Station for Basin 11

Item	Description	Unit	Quantity	Unit Cost	Subtotal
1	Const. Fac. & Temp. Controls[2]	LS	ALL	$121,517	$121,517
2	Demolition & Site Preparation[3]	LS	ALL	$95,478	$95,478
3	Misc. Appurtenances[4]	LS	ALL	$60,759	$60,759
4	Shoring and Piling[5]	LS	ALL	$43,399	$43,399
5	Pump Station	EA	1	$325,000	$325,000
6	Check Valve	EA	1	$3,000	$3,000
7	15" Storm Drain - Class C Backfill	LF	173	$110	$19,030
8	18" Storm Drain - Class C Backfill	LF	260	$115	$29,900
9	24" Storm Drain - Class C Backfill	LF	200	$120	$24,000
10	24" PVC Storm Drain - Bore	LF	150	$500	$75,000
11	24" Outfall w/Tidegate	EA	1	$25,000	$25,000
12	24" Rail Road Crossing	LF	80	$3,500	$280,000
13	Standard Storm Drain Manhole	EA	2	$5,500	$11,000
14	72" Storm Drain Manhole	EA	2	$7,500	$15,000
15	72" Storm Drain Manhole w/Tidegate	EA	1	$20,000	$20,000
16	Catch Basin	EA	1	$1,500	$1,500
17	AC Pavement R&R	TON	320	$120	$38,400
18	Foundation Stabilization	CY	23	$50	$1,150
19	Dewatering[10]	LS	ALL	$17,360	$17,360
			Construction Total		$1,206,492
			Civil Engineering[6]		$241,298
			Geotechnical Engineering		$20,000
			Environmental Study		$25,000
			Resource Agency Permitting[9]		$40,000
			Contingency[7]		$301,623
			Legal & Administration[8]		$36,195
			Total Project Cost		$1,870,608 [1]
			Range:	**$1,683,548 to**	**$2,431,791**

Notes:

1) Cost Estimate does not include permitting through DSL.
2) Constr. Fac. & Temp. Controls = (the sum of Item 5 thru Item 18 multiply by 14%)
3) Demolition & Site preparation = (the sum of item 5 thru item 18 multiply by 11%)
4) Misc. Appurtenances = (the sum of item 5 thru item 18 multiply by 7%)
5) Shoring and Piling = (the sum of item 5 thru item 18 multiply by 5%)
6) Civil Engineering = (Construction total multiply by 20%)
7) Contingency = (Construction total multiply by 25%)
8) Legal & Administration = (Construction total multiply by 2%)
9) Resource Agency permitting (ODOT, ODOT RAIL, COE, DEQ)
10) Dewatering = (the sum of Item 5 thru 18 multiply by 2%)

City of Coos Bay
Golden Pump Station/Interceptor (Basin 14)[1]

Item	Description	Unit	Quantity	Unit Cost	Subtotal
	Golden Pump Station				
1	Const. Fac. & Temp. Controls[3]	LS	ALL	$157,006	$157,006
2	Misc. Appurtenances[11]	LS	ALL	$78,502.83	$78,503
3	Dewatering	LS	ALL	$19,000	$19,000
	Storm Drain Piping				
4	AC Pavement R&R	LF	40	$120	$4,800
5	36" Strom Drain Pipe, Dike Xing	LF	50	$255	$12,750
6	36" Storm Drain Pipe, Class B	LF	100	$140	$14,000
	Piling				
7	Furnish Pile Driving Equipment	LS	ALL	$31,670	$31,670
8	Furnish Concrete Piles	LF	800	$38	$30,400
9	Drive Concrete Piles	EA	8	$1,520	$12,160
10	Sheet piling	SF	5000	$38	$190,000
11	Site Excavation	LS	ALL	$38,000	$38,000
12	Manholes	EA	2	$10,135	$20,270
	Interior Manhole Work				
13	Trash Rack/Screens	EA	1	$12,670	$12,670
14	Grouting	EA	1	$5,070	$5,070
	Pump Station Piping				
15	Force Main Piping	LS	ALL	$6,335	$6,335
16	Connections, Fittings	LS	ALL	$12,670	$12,670
17	Supports	LS	ALL	$6,335	$6,335
	Pump Station Backfilling				
18	Material	CY	500	$32	$16,000
	Top Deck/Walls/Etc.				
19	Reinforced Concrete	CY	200	$700	$140,000
20	Grating	LS	ALL	$6,335	$6,335
21	Fencing	LF	200	$32	$6,400
22	Slide Gate	EA	1	$6,335	$6,335
23	Slide Gate Installation	EA	1	$1,900	$1,900
	Building				
24	Split Face Block Building	SF	400	$190	$76,000
25	Mechanical Louvers	EA	2	$6,335	$12,670
	Electrical				
26	Materials	LS	ALL	$17,735	$17,735
27	Telemetry/Controls	LS	ALL	$15,200	$15,200
28	Standby Generator	LS	ALL	$76,000	$76,000
	Equipment				
29	Pump	EA	2	$107,675	$215,350
30	Pump Installation	EA	2	$10,135	$20,270
31	Wetwell Level Monitor	EA	1	$6,335	$6,335
32	36" Tide Gate	EA	1	$25,000	$25,000
33	Tide Gate Installation	EA	1	$2,535	$2,535
	Sitework				
34	Site Restoration	LS	ALL	$15,454	$15,454
35	Access Road	LS	ALL	$38,000	$38,000
36	AC Pavement	TON	20	$76	$1,520
37	Rip Rap	CY	100	$63	$6,300
	Golden Interceptor				
38	Const. Fac. & Temp. Controls[8]	LS	ALL	$23,555	$23,555
39	Demolition & Site Preparation[9]	LS	ALL	$18,508	$18,508
40	Misc. Appurtenances[10]	LS	ALL	$11,778	$11,778
41	Foundation Stabilization	CY	42	$50	$2,100
42	18" Storm Drain - Class C Backfill	LF	650	$115	$74,750
43	30" Storm Drain - Class C Backfill	LF	500	$125	$62,500
44	Standard Storm Drain Manhole	EA	4	$5,500	$22,000
45	Catch Basin	EA	6	$1,500	$9,000
				Construction Total	$1,581,167
				Civil Engineering[4]	$316,233.50
				Geotechnical Engineering	$40,000
				Structural Engineering	$20,000
				Environmental Study	$25,000
				Resource Agency Permitting[7]	$40,000
				Contingency[5]	$395,291.87
				Legal & Administration[6]	$47,435.02
				Total Project Cost	$2,465,128 [2]
				Range: $2,218,615 to	$3,204,666

Notes

1) The pump station and interceptor projects have been broke out separately for this cost estimate.
2) Cost estimate does not include permitting through DSL.
3) Constr. Fac. & Temp. Controls = (the sum of Item 3 thru Item 37 multiply by 14%)
4) Civil Engineering = (Construction total multiply by 20%) This includes both projects.
5) Contingency = (Construction total multiply by 25%) This includes both projects.
6) Legal & Administration = (Construction total times 2%) This includes both projects.
7) Resource Agency permitting (ODOT, ODOT RAIL, COE, DEQ)
8) Constr. Fac. & Temp. Controls = (the sum of Item 41 thru Item 45 times 14%)
9) Demolition & Site preparation = (the sum of Item 41 thru Item 45 multiply by 11%)
10) Misc. Appurtenances = (the sum of Item 41 thru Item 45 multiply by 7%)
11) Misc. Appurtenances = (the sum of Item 3 thru Item 37 multiply by 7%)

City of Coos Bay
Drainage Basin 11 Interceptor (Basin 11)

Item	Description	Unit	Quantity	Unit Cost	Subtotal
1	Const. Fac. & Temp. Controls [2]	LS	ALL	$44,398	$44,398
2	Demolition & Site Preparation [3]	LS	ALL	$34,884	$34,884
3	Misc. Appurtenances [4]	LS	ALL	$22,199	$22,199
4	Shoring and Piling [5]	LS	ALL	$15,856	$15,856
5	Foundation Stabilization	CY	40	$50	$2,000
6	12" Storm Drain - Class C Backfill	LF	660	$105	$69,300
7	18" Storm Drain Piping - Class C Backfill	LF	315	$115	$36,225
8	18" Rail Road Crossing	LF	20	$3,500	$70,000
9	Tidegate - 18"	EA	1	$20,000	$20,000
10	Catch Basin	EA	2	$1,500	$3,000
11	AC Pavement R&R	TON	960	$120	$115,200
12	Rip Rap	TON	20	$70	$1,400
13	Dewatering [10]	LS	ALL	$6,343	$6,343
	Construction Total				$440,804
	Civil Engineering [6]				$88,161
	Geotechnical Engineering				$20,000
	Environmental Study				$25,000
	Resource Agency Permitting [9]				$40,000
	Contingency [7]				$110,201
	Legal & Administration [8]				$13,224
	Total Project Cost				$737,390 [1]
	Range:	**$663,651**	**to**		**$958,606**

Notes:

1) Cost estimate does not include permitting through DSL.
2) Constr. Fac. & Temp. Controls = (the sum of Item 5 thru Item 12 multiply by 14%)
3) Demolition & Site preparation = (the sum of item 5 thru item 12 multiply by 11%)
4) Misc. Appurtenances = (the sum of item 5 thru item 12 multiply by 7%)
5) Shoring and Piling = (the sum of item 5 thru item 12 multiply by 5%)
6) Civil Engineering = (Construction total multiply by 20%)
7) Contingency = (Construction total multiply by 25%)
8) Legal & Administration = (Construction total multiply by 2%)
9) Resource Agency permitting (ODOT, ODOT RAIL, COE, DEQ)
10) Dewatering = (the sum of Item 5 thru 12 multiply by 2%)

City of Coos Bay
Pump Station 11 Upgrade (Basin 10A)

Item	Description	Unit	Quantity	Unit Cost	Subtotal
1	Const. Fac. & Temp. Controls[2]	LS	ALL	$15,075	$15,075
2	Demolition & Site Preparation[3]	LS	ALL	$11,845	$11,845
3	Misc. Appurtenances[8]	LS	ALL	$2,154	$2,154
4	New 15hp Pumps	EA	2	$19,000	$38,000
5	Catch Basin Backflow Preventers	EA	10	$2,534	$25,340
6	Wetwell Retrofit	LS	ALL	$12,668	$12,668
7	Electrical Controls and Panels	LS	ALL	$31,670	$31,670
	Construction Total				$136,751
	Civil Engineering[4]				$27,350
	Geotechnical Engineering				$20,000
	Environmental Study				$25,000
	Resource Agency Permitting[7]				$40,000
	Contingency[5]				$34,188
	Legal & Administration[6]				$4,103
	Total Project Cost				$287,392 [1]
	Range:	**$258,652**	**to**		**$373,609**

Notes:

1) Cost estimate does not include permitting through DSL.
2) Constr. Fac. & Temp. Controls = (the sum of Item 4 thru Item 7 multiply by 14%)
3) Demolition & Site preparation = (the sum of item 4 thru item 7 multiply by 11%)
4) Civil Engineering = (Construction total multiply by 20%)
5) Contingency = (Construction total multiply by 25%)
6) Legal & Administration = (Construction total multiply by 2%)
7) Resource Agency permitting (ODOT, ODOT RAIL, COE, DEQ)
8) Misc. Appurtenances = (the sum of Item 4 thru 7 multiply by 2%)

City of Coos Bay
Alder Avenue Outfall (Basin 9)

Item	Description	Unit	Quantity	Unit Cost	Subtotal
1	Const. Fac. & Temp. Controls[2]	LS	ALL	$29,806	$29,806
2	Demolition & Site Preparation[3]	LS	ALL	$23,419	$23,419
3	Misc. Appurtenances[4]	LS	ALL	$14,903	$14,903
4	Shoring and Piling[5]	LS	ALL	$10,645	$10,645
5	Foundation Stabilization	CY	20	$50	$1,000
6	12" Storm Drain - Class C Backfill	LF	550	$70	$38,500
7	12" Rail Road Crossing	LF	20	$3,500	$70,000
8	Tidegate -12"	EA	1	$15,000	$15,000
9	Standard Storm Drain Manhole	EA	3	$5,500	$16,500
10	Catch Basin	EA	3	$1,500	$4,500
11	AC Pavement R&R	TON	550	$120	$66,000
12	Rip Rap	TON	20	$70	$1,400
	Construction Total				$291,673
	Civil Engineering[6]				$58,335
	Geotechnical Engineering				$20,000
	Environmental Study				$25,000
	Resource Agency Permitting[9]				$40,000
	Contingency[7]				$72,918
	Legal & Administration[8]				$8,750
	Total Project Cost				$516,676 [1]
	Range:	**$465,008**	**to**		**$671,679**

Notes:

1) Cost estimate does not include permitting through DSL.
2) Constr. Fac. & Temp. Controls = (the sum of Item 5 thru Item 12 multiply by 14%)
3) Demolition & Site preparation = (the sum of item 5 thru item 12 multiply by 11%)
4) Misc. Appurtenances = (the sum of item 5 thru item 12 multiply by 7%)
5) Shoring and Piling = (the sum of item 5 thru item 12 multiply by 5%)
6) Civil Engineering = (Construction total multiply by 20%)
7) Contingency = (Construction total multiply by 25%)
8) Legal & Administration = (Construction total multiply by 2%)
9) Resource Agency permitting (ODOT, ODOT RAIL, COE, DEQ)

ATTACHMENT D

PRIORITIZATION MATRIX

Drainage Project Prioritization Matrix

Criteria	Weighted Value	Total Score	Alder Outfall $671,679 Score Actual	Alder Outfall Weighted	Pump Station 11 Upgrade[1] $373,609 Score Actual	Pump Station 11 Upgrade Weighted	Drainage Basin 11 Interceptor[1,2] $958,606 Score Actual	Drainage Basin 11 Interceptor Weighted	Golden Pump Station & Interceptors $3,204,666 Score Actual	Golden Pump Station & Interceptors Weighted	Downtown Pump Station for Basin 11 (Egyptian Theatre Flooding) $2,431,791 Score Actual	Downtown Pump Station for Basin 11 (Egyptian Theatre Flooding) Weighted
1.0 - PUBLIC SAFETY IMPACTS	**30%**											
1.1 Emergency Vehicle (fire, police, EMT) access	4.725	3	1	1.6	1	1.6	3	4.7	2	3.2	1	1.6
1.2 Vehicular Impacts/Circulation (excluding emergency vehicles)	4.725	3	1	1.6	3	4.7	3	4.7	3	4.7	2	3.2
1.3 Road delineation visibility	4.725	3	1	1.6	2	3.2	3	4.7	3	4.7	1	1.6
1.4 ADA Impacts and Special Needs	4.725	3	1	1.6	2	3.2	3	4.7	3	4.7	1	1.6
Subtotal	18.9	12	4	6.3	4	12.6	12	18.9	11	17.3	5	7.9
2.0 - ECONOMIC IMPACTS	**20%**											
2.1 Private property value impact	3.15	3	1	1.1	2	2.1	1	1.1	1	1.1	1	1.1
2.2 Public property value impact	3.15	3	1	1.1	1	1.1	3	3.2	1	1.1	1	1.1
2.3 Identified in Master Plan	3.15	3	3	3.2	3	3.2	3	3.2	3	3.2	1	1.1
2.4 Enhance growth/development	3.15	3	2	2.1	2	2.1	2	2.1	2	2.1	2	2.1
Subtotal	12.6	12	7	7.4	8	8.4	9	9.5	7	7.4	5	5.3
3.0 - TECHNICAL CRITERIA	**20%**											
3.1 Frequency of drainage problem occurrence	2.52	3	2	1.7	3	2.5	3	2.5	2	1.7	3	2.5
3.2 Intensity of flooding caused by average storm	2.52	3	2	1.7	3	2.5	3	2.5	3	2.5	1	0.8
3.3 Design standards	2.52	3	3	2.5	2	1.7	1	0.8	3	2.5	3	2.5
3.4 Complexity of solution	2.52	3	3	2.5	3	2.5	1	0.8	0	0.0	0	0.0
3.5 Site accessibility (easements, permission to access)	2.52	3	1	0.8	2	1.7	3	2.5	1	0.8	1	0.8
Subtotal	12.6	15	11	9.2	13	10.9	11	9.2	9	7.6	8	6.7
4.0 - ENVIRONMENTAL/ECOLOGICAL IMPACTS	**20%**											
4.1 Habitat impacts from drainage problem	4.2	3	0	0.0	0	0.0	3	4.2	0	0.0	0	0.0
4.2 Habitat impacts from proposed drainage improvements	4.2	3	1	1.4	0	0.0	3	4.2	1	1.4	1	1.4
4.3 Permitting	4.2	3	2	2.8	3	4.2	3	4.2	2	2.8	2	2.8
Subtotal	12.6	9	3	4.2	3	4.2	9	12.6	3	4.2	3	4.2
5.0 - OTHER IMPACTS	**10%**											
5.1 Agency Impacts - Port of Coos Bay	1.26	3	0	0.0	3	1.3	3	1.3	0	0.0	0	0.0
5.2 Agency Impacts - Oregon Department of Transportation (ODOT)	1.26	3	3	1.3	3	1.3	0	0.0	1	0.4	2	0.8
5.3 Agency Impacts - ODOT Rail	1.26	3	0	0.0	3	1.3	3	1.3	0	0.0	0	0.0
5.4 Agency Impacts - North Bend	1.26	3	3	1.3	3	1.3	3	1.3	3	1.3	3	1.3
5.5 Access to recreation facilities (e.g. Boardwalk, Museum etc.)	1.26	3	0	0.0	0	0.0	1	0.4	1	0.4	1	0.4
Subtotal	6.3	15	6	2.5	12	5.0	10	4.2	5	2.1	6	2.5
Total	63	63	31	29.6	40	41.2	51	54.4	35	38.5	27	26.6

(1) This project was evaluated based on the fact the failure of the existing improvement had occurred.

(2) This project is identified as "Egyptian Interceptor" in 2004 Master Plan. To avoid confusion with the Egyptian Theatre flooding the name was changed.