HGE INC

ARCHITECTS
ENGINEERS
SURVEYORS
PLANNERS

Offices:
19 NW 5th AVE.
PORTLAND,
OREGON
97209

503.222.1687
FAX 503.222.2754
genera[illegible]gepdx.com

375 PARK AVE.
COOS BAY,
OREGON
97420

541.269.1166
FAX 541.269.1833
gener[illegible]hge1.com

Project #: 04.97

STORM WATER DRAINAGE MASTER PLAN

for:

City of Wheeler, Oregon

Final - August 2005

This project has been funded in part by the United States Environmental Protection Agency under assistance agreement C9-000451.04 to the Oregon Department of Environmental Quality. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. This project was also funded in part from Oregon Lottery proceeds with a technical assistance award from the Water/Wastewater Financing Program administered by the State of Oregon Economic and Community Development Department.

Project No. 04.97

STORM WATER DRAINAGE MASTER PLAN

Prepared for:

CITY OF WHEELER
P.O. BOX 147
WHEELER, OREGON 97147
(503) 368-5767

Final - August 2005

Prepared by:

HGE, INC., ARCHITECTS, ENGINEERS, SURVEYORS, & PLANNERS
19 NW Fifth Avenue, Suite 300
Portland, Oregon 97209
(503) 222-1687 Fax: (503) 222-2754

Expires 12/31/06

This project has been funded in part by the United States Environmental Protection Agency under assistance agreement C9-000451.04 to the Oregon Department of Environmental Quality. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. This project was also funded in part from Oregon Lottery proceeds with a technical assistance award from the Water/Wastewater Financing Program administered by the State of Oregon Economic and Community Development Department.

TABLE OF CONTENTS

Summary

Section 1: Introduction

Section 2: Physical Environment

Section 3: Socio-economic Environment

Section 5: Regulatory Considerations

Section 6: Hydrologic/Hydraulic Analysis

Section 7: Recommended Plan

Section 8: Financing and Implementation

SUMMARY

S.1 BACKGROUND

The City of Wheeler is located in Tillamook County approximately 22 miles north of Tillamook. It is situated on the east bank of Nehalem Bay and is surrounded by hillsides that extend upwards approximately 1,300 feet in elevation and include a drainage area of approximately 4,400 acres. The current (July 2004) population is 410 persons. Residential development is very active and anticipated to continue in the foreseeable future.

In 2003, DEQ completed its total maximum daily load (TMDL) study for the North Coast Subbasins. The study includes the Nehalem River and its tributaries. Its purpose was to establish water quality goals within the North Coast Subbasins. A TMDL is the total quantity of a specified pollutant that enters the water body without violating water quality standards. The Federal Clean Water Act (CWA) requires the establishment of TMDLs for water quality limited bodies of water under Section 303 (d) of the CWA. Nehalem Bay, adjacent to Wheeler, was listed in 1998 as water quality limited for fecal coliform. The TMDL study found, based on modeling, that water quality standards, for fecal coliform near Wheeler, were generally met during the later summer, and that the greatest violations of water quality standards were likely to occur in the late fall and early winter. Exceedence of the fecal criteria is the basis for DEQ's requirement that the City prepare this storm water drainage master plan.

S.2 EXISTING STORMWATER INFRASTRUCTURE AND ISSUES

Wheeler's storm drainage system is largely undocumented and the product of adhoc efforts to solve localized problems. Relatively few areas are served by a system of stormwater intakes and pipelines; most areas are served by ditches and isolated culverts. "Ditch" is a very broad term in this context, since many of the ditches have largely filled in or are simply or are simply low areas that have eroded sufficiently to act as channels. Many culverts are filled with sediment which severely limits their utility. Some culverts have filled in to the point where it is almost impossible to locate them without prior knowledge of their existence and approximate location.

Many of the City streets lack sufficient surface curvature (crown) to direct water effectively to a suitable ditch or intake. Rainfall sheets directly down roadways in many places. In some gravel roadways, the sheeting has eroded channels on the surface itself.

Extensive fieldwork was conducted in winter and spring 2005 to locate and document the

existing culverts and other storm water related problems and infrastructure. City provided plans (for various improvement projects) were also checked and field verified for storm water related features. Problem areas were more noted and, as part of the visual survey, potential pollutant sources were also noted. Most fieldwork was conducted during the extensive dry weather periods that characterized early 2005. Surface water flow patterns were noted on several wet weather visits. This latter information was used to refine basin delineation and to help define problem areas and project needs.

Detailed mapping was prepared to show locations of existing physical features, drainage basins, general drainage flow directions, and stormwater infrastructure. Hydrologic analyses were performed for each basin, using HydroCAD software, for 24-hour storms with 25, 50, and 100-year return intervals. Most of the drainage area lies outside of the City limits. Four streams drain through the City. The streams originate high in the drainage area; consequently, only the lowest parts of the streams are affected by municipal drainage.

Issue of note include:

A 36" pipe conveys Gervais Creek to the Nehalem River. The pipe system passes under several buildings and has resulted, under combined high tide and heavy rainfall conditions, in flooded basements. Flooding is likely in the future if the situation isn't rectified. Obstruction of the intake could result in flooding along Rorvik Street.

Zimmerman Creek passes through a 24" culvert across Hemlock Street. The culvert plugged a few years ago and the resulting back up and runoff severely compromised the roadway and bank, and resulted in subsidence of many parts of the roadway. Municipal utilities, including water and sanitary sewer are located in the roadway and, like the roadway itself, are susceptible to further damage. There is potential for future flow obstructions and damage associated with redirected stream flows and erosion.

Gervais Creek crosses 3rd Street via a 48" culvert that is highly degraded and allowing water to pass along the outside of the culvert. Fill over the culvert includes a major municipal water system pipeline. Failure of the culvert is likely to result in failure of the water line.

S.3 REGULATORY AND FINANCIAL CONTEXT

Oregon adheres to the civil law doctrine of drainage which stems from common law or

court-made law. This doctrine provides for the maintenance of natural drainage across adjoining properties. There are three basic provisions:

1. A landowner may not divert water onto adjoining land that would not otherwise have flowed there.

2. A landowner may not change the place where water flows onto a lower, adjoining property.

3. A landowner may not accumulate large quantities of water, then release it with the result of greatly accelerating on the flow on the lower, adjoining property.

Improvement projects that impact highways, streams, and floodplains are likely to involve coordination with state and/or federal regulatory agencies. Regulatory coordination and permitting can significantly alter the project's scope of work, timeline, and cost.

The City's financial resources are limited and there are few grant/low-interest loan programs potentially available to the City for design and construction of storm water improvements. Financing improvements will require careful project selection and phrasing, and the identification and pursuit of appropriate funding for each project selected. Grant funding alone is unlikely; consequently, most projects will result in cost impacts to the citizens of Wheeler.

S.4 RECOMMENDATIONS

S.4.1 Capital Improvement Plan

S.4.1.1 Improvement Priorities

Specific capital improvements are developed and presented in Section 7.1 of this plan. The projects are summarized below according to relative priority.

Table S.1 Storm Water Capital Improvement Summary

Project Number	Construction Total	Project Total
Priority: Urgent		
#10 (Gervais/3rd)	$32,500	$48,900
Subtotal	**$32,500**	**$48,900**
Priority: Urgent/High		
Hemlock St.[1]	$39,900	$53,800
Subtotal	**$39,900**	**$53,800**
Priority: High		
#8 (Rowe)	$22,900	$30,900
#13 (Alder)	$33,400	$45,100
#19 (Basin N5)	$1,500	$1,500
#24 (Hemlock)	$6,200	$8,400
Subtotal	**$64,000**	**$85,900**
Priority: to be determined by City		
#12, Alt.2 (Gervais Cr.)	$327,400	$452,000
#12, Alt.1 (Gervais Cr.)	$546,000	$747,000
Subtotal	**$327,400-$546,000**	**$452,000-$747,000**
Priority: Medium		
#3 (Pennsylvania)	$61,400	$82,900

[1] Hemlock St. project and costs include portions of other projects. Costs attributable to Hemlock St. stabilization independent of other projects are :$22,500 (construction subtotal) and $30,400 (project total). See discussion in Section 7.2.

#7 (3rd, near Hall)	$2,100	$2,800
#14 (Gregory/2nd)	$50,900	$68,700
#15 (Gregory/1st)	$41,000	$55,400
#17 (Rector)	$13,300	$18,000
#23 (4th)	$70,400	$95,000
Subtotal	**$239,100**	**$322,800**

Priority: Low		
#1 (Dichter)	$18,500	$29,000
#2 (Dichter/Penn.)	$3,500	$8,700
#4 (DuBois)	$9,900	$13,400
#5 (DuBois/2nd)	$6,500	$8,700
#6 (4th near Vosburg)	$2,500	$7,400
#11 (Hwy 101/Hall)	$21,900	$32,700
#16 (Rector/1st)	$7,100	$9,600
#18 (Pine/2nd)	$3,900	$5,300
#20 (Spruce)	$14,700	$19,900
#21 (Hwy 101/Spruce)	$48,00	$66,800
#22 (4th)	$53,700	$72,500
Subtotal	**$190,200**	**$274,000**
Total[2] (excluding project #12)	**$549,300**	**$762,000**
Project #12	**$327,400-$546,000**	**$452,000-$747,000**
Total (all projects)	**$876,700-$1,095,300**	**$1,214,000-$1,509,000**

[2] Total adjusted according to footnote #1 above.

S.4.1.2 Improvement Scheduling

Actual scheduling of improvements will be dependent on the City's perception of need relative to affordability. Projects should be pursued according to the following schedule:

Priority	Timeline
Urgent	As soon as possible
High	Within next 2 years
Medium	Within next 5 years
Low	Within next 20 years

The timeline is not intended to be an inflexible schedule, but rather a guide based on current perception of problem area and needs. Some low priority projects, because of perceived benefits relative to cost, may be constructed prior to higher priority projects. Also, street improvement projects should incorporate recommended storm drainage improvements regardless of priority classification because of the cost effectiveness of coordinated design and construction.

The relocation of Gervais Creek is a project that will require special consideration by the City because of the cost and complexity involved.

S.4.1.3 CIP Implementation and Financing

The study includes numerous projects; however, only a few require immediate or near-term attention. Of these, the most important is the replacement of the 48" culvert on Gervais Creek at 3rd Street (see Project #10 in Section 7.1.9 for details) with a total project cost of $48,900. The Hemlock Street stabilization project (see Section 7.2) is also very important, though complex because of potential geotechnical and groundwater factors. Cost for the surface

water component is $53,800; the geotechnical study is on the order of $30,000. Costs for remedial and stabilization work arising out of the geotechnical study are unknown at this time - as are the costs for reconstructing the road surface. There is no assurance that the recommended surface water improvements alone will fully stabilize the roadway; however, it does appear likely that further damage will occur on Hemlock if the surface water improvements are not constructed.

The Gervais Creek relocation project (Project #12 in Section 7.1.10) will require special consideration because of the high costs ($452,000 - $747,000) and complexity. Costs could escalate depending on requirements of the various agencies involved. If the City desires to proceed, a pre-design report is recommended ($20,000).

Other projects can be implemented in accordance with project need and affordability. Obviously, projects that are not implemented cannot provide benefits; therefore, the City must understand that "in accordance with project need and affordability" refers to the political reality. The physical reality is that many of these projects are needed now based on the theoretical possibility of large rainfall events.

Lack of adequate funding is a common frustration of all municipalities in dealing with drainage problems. Funding for maintenance and capital improvements of storm drainage systems is basic to its successful operation as an efficient conveyance of stormwater runoff. If funds are not made available to address existing problems, the risk of stormwater related damage becomes greater. Adequate funding of the capital improvement projects and completion of the projects recommended in this plan will greatly reduce the risk of major storm water related damage.

Grant funding is generally not available for funding stormwater related improvements; consequently, the "need" for any particular capital improvement is shaped in large

part by the cost of the project and the willingness of the City to devote the funds, or to incur the debt, necessary to complete the project. Priority is generally given to those projects that address existing or incipient problems that can be honestly characterized as urgent. Remaining projects are typically undertaken in accordance with prevailing perceptions of need and affordability.

In general, financing options for storm water related projects are limited. Of the projects identified, the following may be eligible for grant and low interest loan funding:

RD loan/grant for municipal water improvement project

• Project #10 (Gervais at 3rd Street)	$48,900
• Hemlock Street (Section 7.2) surface water improvements	$53,800
• Hemlock Street geotechnical	$30,000
Total:	$132,700

FEMA or ODOT

• Gervais Creek relocation (Project #12)	
Total:	$452,000 - $747,000

Other projects do not appear to be eligible for the grant/loan programs identified.

S.4.2 Other Recommendations

S.4.2.1 Systems Development Charge (SDC)

It is recommended that the City develop SDCs for future storm water improvements (Section 8.3.3).. Development of an SDC methodology by a consultant for storm water is likely to cost

approximately $3,000. SDC monies are not likely to accumulate at a rate that will allow significant, near-term construction of needed improvements.

S.4.2.2 Storm Water Utility

It is also recommended that the City create a storm water utility (Section 8.3.2). Keeping the rate structure very simple (example: $3.00 flat fee per sanitary sewer connection) can generate a reliable cash flow that can be used for debt service or maintenance activities. A $3.00 per month storm water charge attached to the sewer billings (234 connections) would yield $8,424.00 per year.

S.4.2.3 Ordinances

It is recommended that the City of Wheeler considered promulgation of an Erosion and Sediment Control (ESC) ordinance (see Section 7.4). Example ESC ordinances may be obtained from other municipalities with an existing ordinance or it can be provided by a professional consulting firm. Many Oregon cities have such ordinances currently in place. The League of Oregon Cities may be able to provide Wheeler a contact list.

To ensure that future development incorporates rational storm water planning and design, the City should consider development and adoption of storm drainage ordinances (see Section 7.6). Ordinances can be prepared by an engineering or planning consultant with final review and editing by an attorney.

Other storm water related ordinances that may be needed relate to the recommended SDC methodology and establishment of a storm water utility.

S.4.2.4 Maintenance

Maintenance activities should be conducted in accordance with the discussion in Section 7.5. To facilitate maintenance activities, it is recommended that the City purchase a backhoe. A good used backhoe will cost approximately $30,000.

S.4.2.5 Public Information

Dissemination of information to the public regarding storm water issues in general (as well as for specific projects, policies, ordinances, etc.) is essential for community support of needed actions by the City. With regard to improved water quality, it is probably the most important action the City can take. Public discussion can help stimulate interest in storm water related issues and water quality; this in turn can generate support for needed projects. Both Planning Commission meetings and City Council meetings can provide some information for projects and storm water related issues that have become sufficiently important for those bodies to discuss or consider.

With regard to public information, the most difficult part is in determining who or how to implement it. One possibility is to form a committee within the Council or a citizen's committee with close ties to the Council or Planning Commission. The committee should consist of people interested in the topic and capable of researching the needed information, making contacts, and implementing specific approaches.