SECTION 2
STUDY AREA CHARACTERISTICS

General

This section presents a summary of the City of Sheridan study area and its land uses, demographics, economics, geographic and environmental features, and overlying local, state, and federal regulations relative to the preparation of the Storm Drainage Master Plan.

Study Area

The study area for this storm drainage master plan is the area within the current Urban Growth Boundary (UGB) of the City of Sheridan, excepting the Federal Correctional Institute (FCI). The privately owned and operated FCI storm drainage system drains directly to the South Yamhill River is not maintained by the City.

Many areas within the UGB receive contributing runoff from drainage basins extending upstream and outside of the current UGB boundaries. These upstream drainage areas are included within this study for analytical purposes as they influence both the quantity and quality of stormwater runoff collected and conveyed through the City system.

Planning Area

The planning area for this plan is comprised of approximately 1,591 acres of land within the UGB. This includes an area of approximately 1,270 acres of residential, commercial, industrial and institutional land within the existing City limits boundary and 321 additional acres of land within the UGB designated for expansion outside of the existing City limits. The study area, with the UGB and City limits, is illustrated on Figure 2-1.

Contributing Area

The City is located entirely within the South Yamhill River drainage basin. The flood plain and uplands area to the north of the South Yamhill River consists of 10 minor basins and incorporates a total of approximately 2,436 acres. The uplands area drains south through the stormwater collection systems within the City and discharges into the South Yamhill River.

The area south of the South Yamhill River is divided into 8 minor basins, totaling 979 acres, with drainage dominated by a single 832-acre subbasin. This large subbasin drains north to the South Yamhill River and extends from the flood plains adjacent to the river to higher elevations south of Highway 18. The north and south drainage basins are shown in Figures 2-2 and 2-3, respectively, and are described in detail in Section 3.

A separate drainage basin collects runoff from the FCI and surrounding areas up to Highway 18 and discharges directly to the South Yamhill River east of the City limits and south of

Highway 18. As previously noted, the FCI drainage system is not maintained by the City and is therefore outside the scope of this study.

Demographic Characteristics

Demographic characteristics are important in stormwater planning because of the impact they have on the transformation of rainfall to runoff. Of primary concern are the projected uses of land and the general pattern of development within the study area.

Land Use

Land use characteristics are critical in estimating existing and future stormwater flows in an urban setting. The land use determines the amount of impervious area within a basin, and stormwater runoff increases with impervious area. Land use and zoning classifications within the City's UGB are established under the Sheridan Development Ordinance and the most current City of Sheridan Comprehensive Land Use Plan. Existing land uses within the study area include residential, commercial, industrial, institutional, mixed use, public service and urban transitional. The 1998 Buildable Lands Inventory developed by the City planning staff provides guidance for estimating the types of future growth. Land use and zoning areas within current City limits and UGB have been calculated based on Yamhill County Geographical Information System (GIS) data. Land use and zoning classifications for proposed expansion areas are based on City planning staff input and GIS information provided by Yamhill County. The zoning typically reflects the land use of adjacent areas. Table 2-1 summarizes land use, zoning classifications and associated acreage within the existing UGB. Figure 2-1 illustrates the land use in the City.

Existing Development Patterns

The inventory of buildable lands provided in the 1998 City of Sheridan Comprehensive Plan Amendment shows that approximately 281 acres of vacant, residentially designated lands within the City limits were available for future development. Since that time, the City has annexed an additional 33 acres while approximately 61 acres have been developed. Therefore, approximately 253 acres are available for residential development within the current City limits.

Future Development of Expansion Areas

Approximately 321 acres of land between the City limits and UGB are currently designated for residential, commercial, industrial and public facility development. The Yamhill County Land Use Designations and Zoning Ordinance currently regulates land use areas located outside the City limits and within the UGB. As the City annexes residential areas into the City limits, it is anticipated that those areas will remain residential, but will be rezoned in accordance with the zoning code, with densities increased accordingly. These areas are generally located east of Richard Street and north of the river. Expansion areas located west of Richard Street would likely be rezoned for light industrial use, given the nature of the surrounding industrial use.

Table 2-1
Land Use Summary

Zone	Zone Description	Area Within Planning Area (gross acres)
R-1	Low Density Residential District	233
R-2	Medium Density Residential District	283
R-3	Mixed Use Residential District	166
C	Commercial District	62
I	Industrial District	325
PF	Public Facilities District	487
UT	Urban Transitional District	35
	Total	**1,591**

Population

The population of the City of Sheridan was approximately 6,035 people in 2008 according to the 2008 Oregon Population Report (Population Research Center, College of Urban and Public Affairs, Portland State University). Currently, the FCI accounts for approximately one-third of the City's total population. According to the City's Water System Master Plan (2007), Sheridan's population is projected to reach 10,136 in 2030.

Economic Conditions and Trends

The western Willamette Valley is known for its rich, fertile farmland and access to the timber of the Coast Range. As a result, a combination of agriculture, lumber, construction, light manufacturing and commercial establishments drive the local and regional economy. The City's largest employer is the FCI, which employs approximately 150 people. Taylor Lumber & Treating, Liberty Homes, Willamina Lumber and the Sheridan School District are large employers in Sheridan. Located west of Sheridan, the Confederated Tribes of Grand Ronde Spirit Mountain Casino is a regional employer.

Growth in the City of Sheridan is anticipated to continue through the identified planning period. The City has a large supply of developable lands available within the UGB. Other surrounding communities such as McMinnville and Lafayette have instituted voter approval of annexations that may ultimately limit the growth of these cities. The FCI facility is anticipated to be a substantial component of future growth, both in inmates and employees. Additionally, the Spirit Mountain Casino will likely continue to have an impact on the Yamhill County economy as a whole. The State of Oregon recently published data showing that the Spirit Mountain Casino has created the most significant growth impact of all casinos in the State. In general, the timber related industry is not anticipated to grow, and may shrink in employment, although the regional mills, which have a large amount of privately owned land, are generally anticipated to remain a stable employment base over the planning period.

Environmental Conditions

Many environmental conditions affect the quantity and quality of stormwater runoff within the study area. The particular environmental conditions that are relevant to this Storm Drainage Master Plan are summarized below.

Climate

The study area has a temperate climate. Rainfall for the study area averages approximately 42 inches annually based on information from the National Climatic Data Center for McMinnville for the period 1971 through 2000. Most of the precipitation occurs during the fall, winter and spring months. Snowfall is not a common occurrence in Sheridan. Dry periods from one to two months in duration can be expected during the summer months. Temperatures range from an average high of approximately 80 °F in the summer to an average low of approximately 39 °F during the winter months.

Topography

The City is located on flat, gently sloping grasslands ranging in elevation from approximately 180 to 200 feet mean sea level (MSL). The City is bound to the north by steeply sloping valley walls with peak elevations near 1,000 feet MSL. Figures 2-2 and 2-3 show the general topography.

Geology

According to the Yamhill County Soil Survey published by the National Resource Conservation Service (NRCS), the soils in and around the City consist generally of alluvial materials deposited by both the late Pleistocene Missoula floods and modern-day streams. Quaternary silt and sands make up a majority of the alluvial soil and the surrounding hills are composed of clays. The hills around Sheridan are composed of weathered clay material from the decomposition of basalt and sandstone rock formations. The underlying bedrock is occasionally exposed on the steeper slopes.

Detailed information on the soils found throughout the entire planning area is summarized in the U.S. Soil Conservation Service's Soil Survey of the Yamhill Area, Oregon (1974). The soil types identified in this survey generally identify the soils in the study area to be moderate to poorly drained silt loams and silty clay loams formed in alluvial deposits. Table 2-2 summarizes the various soils found and their hydrologic grouping. Figure 2-4 illustrates where these soils can be found within the study area.

Table 2-2
Hydrological Groupings of Soils

Soil Classification and Slope	County Soil Map Label	NRCS Hydrological Group	Runoff Potential
Amity silt loam	Am	C	Moderate
Chehalem silty clay loam, 3 to 12 %	CeC	C	Moderate
Chehalis silty clay loam, overflow	Ch, Ck	B	Low
Cove silty clay loam, 0 to 3%	Cn, Co, Cs	D	High
Dayton silt loam, 0 to 3%	Dc	D	High
Peavine silty clay loam, 2 to 60 %	PcC, PcD, PcE, PCF	B	Low
Shale rock land	SH	D	High
Stony land	SL	A	Very low
Steiwer silty clay loam, 5 to 50 %	StD, StE, StF	C	Moderate
Wapato silt loam, 0 to 3 %	Wc	D	High
Willakenzie silty clay loam, 2 to 45 %	WeC, WeD, WeE, WeF	C	Moderate
Willamette silt loam, 0 to 12 %	WIA, WIC	B	Low
Woodburn silt loam, 0 to 7%	WkB, WkD	C	Moderate

The hydrological groups shown in Table 2-2 are very important in predicting area wide hydrological responses. Soils are classified by the NRCS into four Hydrologic Soil Groups based on the soil's runoff potential. The four Hydrologic Soils Groups are A, B, C and D where group A has the least runoff potential and D the greatest. The relationship of these soil groups and other important watershed characteristics to the hydrological techniques used in this study are described in Section 4.

Natural Hazards

The most severe natural hazards to be expected in the Sheridan area are flooding and the failure of steep slopes. A 1998 flood insurance rate map published by the Federal Emergency Management Agency (FEMA) indicates that a flood with a 100-year recurrence interval would raise the river level to approximately 193 feet MSL near the South Yamhill River bridge. It is expected that such a flood would inundate most of the currently developed portions of town and up to 70 percent of the land within the UGB. See Figure 2-4 for a general outline of the 100-year flood plain.

The upland areas of the study area have severe erosion hazards. According to the Oregon Department of Geology and Mineral Industries' earthquake hazard maps, hazards from earthquake-induced landslides in the City are low on the valley floor and moderate in the surrounding hills. The few areas of high hazard in the hills are associated with existing landslides. A designated high hazard area is located at the end of Cherry Hill Road in the northeast section of the study area. Earthquake liquefaction hazards exist in a small strip of land along the South Yamhill River where the alluvial sediments are thickest.

Water Resources

Local surface water sources include the South Yamhill River and its tributaries—Rock Creek, Canyon Creek and Mill Creek. The South Yamhill River runs through the center of the City from west to east. The river is used for recreation, irrigation and as a municipal water supply for the City.

Wetlands, including wetlands identified by the U.S. Fish and Wildlife Service, National Wetlands Inventory, are present in many undeveloped areas of the City. This inventory does not identify all of the wetland areas known to exist within the City's UGB. Recent wetland studies (Fernwood Environmental Studies, 2004 and Mroczec, 2001) have identified jurisdictional wetlands in the west area of the City, between Rock Creek Road and Richard Street.

Groundwater is present in shallow aquifers of varying size within the study area. Yields are generally very low and wells in the area are used primarily for low volume irrigation.

The local water quality is generally considered to be good. The creeks and rivers do not exhibit major pollution problems, although soil erosion, urban storm water runoff and infiltration and runoff from agricultural land influence the water quality. The South Yamhill River is water quality limited for temperature during the summer and water quality limited year-round for bacteria, iron and manganese as determined by the Oregon Department of Environmental Quality (DEQ) 303(d) List.

In addition, the DEQ began development of a Total Maximum Daily Load (TMDL) for the South Yamhill River in 2007. It is anticipated that the TMDL will be established in 2009-2010, and will set parameters for the following water quality constituents and pollutants:

- Chlorophylla
- Chlorpyrifos
- Dissolved oxygen
- Bacteria
- Iron
- Manganese
- Temperature

Flora and Fauna

Many small wildlife species are found in the study area, such as songbirds, which are compatible with urban development. Migrating waterfowl are also known to layover on the City's wastewater lagoons located in the southern part of the city.

The South Yamhill River provides significant habitat for native fish species, including salmon, steelhead, and trout. Permits administered by U.S. Army Corps of Engineers and

Oregon Department of State Lands would be required for any in-water work associated with projects recommended by this study.

Environmentally Sensitive Areas

There appear to be no environmentally sensitive areas within the UGB, beyond those associated with the various waterways in the study area.

Regulatory Considerations

Until relatively recently, it has been customary for municipal stormwater management programs to deal exclusively with the design, operation and maintenance of the stormwater system to optimize the conveyance of stormwater. In the last two decades there has been a growing awareness of the potential of non-point sources of pollution to degrade surface water quality and reduce the possible beneficial uses of the receiving water bodies. It has been estimated that non-point sources of pollution cause up to two thirds of the degraded stream miles in the United States. Non-point sources of pollution are typically carried to streams through stormwater runoff. Because of the extent of the surface water degradation caused by non-point sources of pollution, the regulations of the Federal Clean Water Act (CWA) apply to stormwater runoff.

National Permit Discharge Elimination System (NPDES)

In the early 1990's, the U.S. Environmental Protection Agency (EPA) promulgated regulations establishing Phase I of the National Pollutant Discharge Elimination System (NPDES). This program requires operators of municipal separate storm sewer systems (MS4s) in municipalities greater than 100,000 to obtain an NPDES permit to discharge stormwater to public waters.

Phase II regulations covering small MS4 permits were established in 2003. The permitting authority, which for Sheridan is the Oregon DEQ, can designate small MS4 permits by automatic nationwide designation as an "urbanized area" as defined by the Bureau of the Census; by physical interconnection to another MS4 permitted system; or by required evaluation. The required evaluation is required for any potential MS4s located outside of an urbanized area serving a jurisdiction with a population of at least 10,000 and a population density of at least 1,000 people per square mile. The EPA recommends that the DEQ use the following criteria when evaluating if a municipality should be regulated as an MS4 system:

- Discharge to sensitive waters
- High population density
- High growth or growth potential
- Contiguity to Bureau of the Census defined urbanized area
- Significant contributor of pollutants to the waters of the United States
- Ineffective protection of water quality concerns by other programs

The City's population puts it under the threshold for required evaluation as a small MS4 by the DEQ. At this time, it does not seem likely that the DEQ will choose to regulate the City storm drainage system as a MS4 for the following reasons:

- The South Yamhill River is not currently considered a sensitive water by DEQ.
- The City is not currently experiencing high growth, and this is anticipated to remain the case for the near future
- The City is not part of a defined urbanized area nor will it be in the foreseeable future.

Water bodies with an established TMDL are considered sensitive waters by the DEQ. The South Yamhill River does not currently have an established TMDL for any constituent. However, as discussed above, DEQ has identified the South Yamhill River as a Priority II water body with TMDL development scheduled to be completed by 2010.

It is not known if DEQ will designate the City as a "significant contributor" of pollutants to the South Yamhill River. This information will be determined in the DEQ water quality study of the South Yamhill River. However, similar sized Oregon communities have not been singled out as significant contributors, and it is unlikely that Sheridan will be designated as such for the remainder of the planning period.

Stormwater Quality Management

Without an NPDES permit or a final TMDL study there is no regulatory framework to establish water quality standards for the City's storm drainage system. The City may consider forming a study group or committee to define the need and purpose of water quality regulations until Federal water quality regulations are applied. The City can incorporate or recommend storm drain system facilities that provide both stormwater detention/conveyance capacity and treatment when replacing existing systems or designing/reviewing new systems. When feasible and where conditions warrant, facilities with storm water treatment benefits, such as open ditch conveyance and constructed wetlands as detention facilities, may be recommended in this report.