

CHAPTER 1

INTRODUCTION

1.0 VISION

The vision for the Stormwater Master Plan (SWMP) is an outgrowth of the Corvallis 2020 Vision Statement. Its purpose is to paint a picture for how stormwater will be addressed in the future.

We value our rivers, streams, and watersheds, carefully managing them to protect the purity of our water, their aesthetic and biological qualities, and their value as recreational areas. The City's streams and wetlands act as the backbone for a system of "green fingers" that weave through and connect the City's open space resources. These "green fingers" provide habitat corridors where native plants and wildlife flourish in their natural state. These "green fingers" widen out at community parks and open space preserves to provide additional storage capacity for flooding events.

Our natural open space helps buffer flood events, purify our air and water, provide recreational and educational opportunities, and reinforce the community's distinctive character. Corvallis has identified its open space resources, and has established criteria and priorities for open space protection. Natural flooding is encouraged, while urban flooding is managed through detention, enhanced stream capacity, and additional forest cover.

The community's water supply, streams, and creeks are clean and clear. Water conservation efforts decrease the amount of water City residents consume. Drinking water quality has been improved by convincing upstream entities to stop polluting the Willamette and its tributaries. Runoff from roads and other pollution sources is collected and treated before being discharged. We guard our precious water sources closely, by exercising extreme care in disposing of hazardous wastes, and we closely follow state and federal environmental regulations.

Pollution obeys no human boundaries. Recognizing that, the City coordinates its water quality efforts with other communities, surrounding counties, and resource management agencies in the Willamette Valley. This cooperative strategy has created a cleaner, healthier environment by encouraging improved farming and forestry techniques. Oregon State University and valley ranchers have helped improve stream water quality through better animal management practices and waste disposal methods.

The City provides leadership by managing each of its watersheds to accommodate natural hydrological processes. This is achieved through innovative low-technology approaches to watershed management. The City maintains stream functions within the urban areas while achieving compact urban form. Land use regulations for both urban and rural development ensure that stream functions are preserved and in some cases enhanced. Developers are informed of the implications associated with soil erosion during construction, and take special precautions to control unwanted erosion. The City has taken steps to protect and restore natural habitats, which have improved ecosystem functions. The City has developed implementation measures to ensure that long-term costs associated with new stormwater measures will benefit future generations.

Property owners adjacent to streams take an active role in maintaining and enhancing streamside property. This has been accomplished through an ongoing educational campaign that has heightened community awareness of natural stream functions.

1.1 INTRODUCTION

The City's SWMP recommends policies, activities, and programs formulated to improve water quality, address existing and future conflicts between flooding and development, and preserve and enhance valuable natural resources, including stream and floodplain systems. The recommendations will directly affect the City's capital improvement and operating programs. In addition, new policies and development standards have been recommended that will affect the way future development is conducted within the area. Implementation of the SWMP will require the active involvement and cooperation of all property owners, City departments, and State and federal agencies.

1.2 AUTHORIZATION AND PURPOSE

In December 1997, the City began developing an updated SWMP for guiding upgrades and expansion of the stormwater system to meet the area's needs over the next 20 years. The SWMP provides recommendations to address existing system deficiencies, projected growth-related requirements, and the requirements of State and federal regulations. The capital and operating costs for implementing project recommendations are identified.

1.3 BACKGROUND

The SWMP addresses the management of stormwater and natural stream systems within the study area illustrated in Figure 4-1. The study area extends beyond the City boundary and, in some places, outside of the current Urban Growth Boundary (UGB). The study area includes the entire drainage basin that contributes flow to each of the streams that pass through the City. This watershed-based approach to stormwater management provides a perspective for addressing all of the needs of each stream system and for including all of the stakeholders in the planning and implementation process. Stakeholders include the citizens living within the watershed, private and public property owners, the City, Benton County, and OSU.

1.3.1 Historical Drainage Management

The surface water drainage system has developed as one of the necessary components of infrastructure required to support City growth and vitality. Throughout the City's history, the drainage system has been constructed to convey surface runoff, to drain low areas as part of new development, and to prevent flooding. Water quality and natural resource protection objectives were not a part of early development activities. The area's streams were used, and continue to be used, as receiving points for local stormwater drainage.

Urbanization and past stormwater management practices have taken a toll on the City's streams, wetlands, and riparian areas. Increased development has increased the quantity of impervious areas, which directly affects stormwater runoff volumes and velocities. Increased stormwater runoff and

higher velocities have upset the natural equilibrium of the stream, resulting in streambed and stream-bank erosion that is evident throughout the City. In addition, development tends to decrease the width of riparian and upland areas adjacent to streams. Loss of these natural areas reduces water quality, increases runoff rates, and decreases biological diversity. In general, urbanization negatively impacts the stream, riparian, wetland, and upland ecosystem. Chapter 4 provides a more in-depth discussion on the impacts of urbanization.

1.3.2 Previous Plans

Several planning documents have been previously developed to assist the City with its stormwater management:

- *Corvallis Drainage Master Plan*, CH2M Hill, May 1981
- *Dixon Creek Flood Reduction Analysis*, KCM, December 1997
- *South Corvallis Drainage Master Plan*, KCM, December 1998

The *Corvallis Drainage Master Plan*, completed in May 1981, formed the basis of the City's stormwater management for the next 20 years. Its focus was to develop infrastructure for the safe conveyance of stormwater flows. Water quality and natural resources were not addressed.

The *Dixon Creek Flood Reduction Analysis* addresses the specific needs of Dixon Creek. Frequent flooding along this stream, and in particular, the severe storm events of February and November 1996, threatened private property and the safety of local residents. In response, the City initiated the analysis to identify flood control measures for Dixon Creek. The analysis recommends 11 projects to address flooding, several of which have been implemented.

The *South Corvallis Drainage Master Plan* (SCDMP) was developed in 1996 and approved by the City in December 1998. The SCDMP addresses stormwater drainage issues in the southern portions of Corvallis that hinder development of vacant lands in the area. The SWMP augments the recommendations proposed by the SCDMP through measures that will affect stormwater management throughout the City.

1.3.3 Existing Stormwater Financing

In 1978, the City Council approved an ordinance establishing a stormwater utility. The utility was formed to fund capital improvements and activities as required for managing the City's stormwater conveyance system. In general, funds are generated by monthly fees to the utility users and by one-time System Development Charges (SDCs) for new construction. The funds generated by the monthly fees are used to address existing system deficiencies and to operate and maintain the conveyance system. Unlike the monthly fees, the SDCs are used to address extra-capacity or growth-related stormwater improvements.

In fiscal year 99-00, monthly fees generated approximately \$1.5 million in revenue for funding stormwater related activities and improvements. Approximately 13,600 accounts (customers) contribute to the stormwater fund with rates based on equivalent surface units (ESUs). An ESU

represents approximately 2,750 square feet of impervious surfaces. A monthly charge is levied against each ESU; in fiscal year 99-00 the charge was \$4.23.

A citywide study in 1999 updated the SDCs. The charges will be updated again to include the funding recommendations of the SWMP. SDCs are an important component of the stormwater fund with approximately \$44,000 added to the fund in fiscal year 99-00. In 2001, the storm drainage component of the SDC was calculated based on \$0.0306 per square feet of impervious surface. For a 2,600 square foot single-family residence, this is equal to a one-time charge of \$79.56.

1.4 SWMP OBJECTIVES

Early in the development of the SWMP, the City and the citizen-based Stormwater Planning Committee (SWPC) identified watershed-related management issues that needed to be addressed in the SWMP. Each issue constitutes an element of the overall watershed approach that forms the basis for the SWMP:

- Stormwater quality
- Stormwater quantity
- Uplands and wetlands natural resources
- Floodplain
- Stream system
- Public participation and information outreach
- Cross-jurisdictional stormwater management

The City and the SWPC identified objectives for each issue identified above. The overall management strategy focuses on achieving these objectives. Chapter 5 describes the objectives and the policies that were developed for addressing the issues.

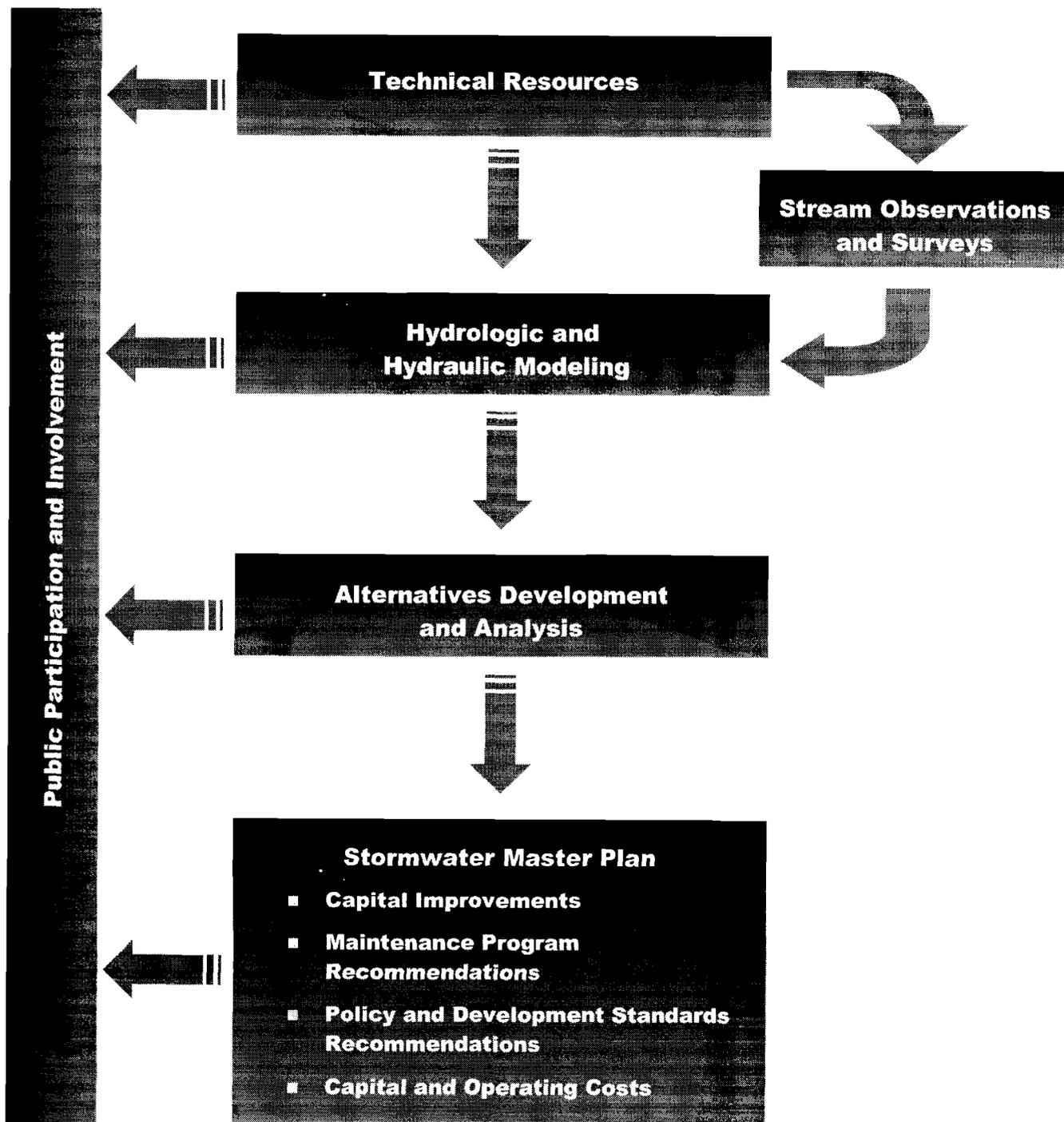
1.5 DEVELOPMENT PROCESS OF THE SWMP

The following tasks were required to be completed prior to the preparation of the SWMP.

- Public involvement process
- Field investigations
- Modeling and technical studies
- Identification of problem areas and opportunities
- Alternatives development
- Policy recommendation
- Capital improvement recommendation

Figure 1-1 shows the sequence of major tasks for developing the SWMP and the involvement of the public process.

Figure 1-1. Activity Flowchart



1.5.1 Public Involvement Process

The community's input and involvement during the planning process was of paramount importance to the City. The Mayor began the process by appointing the Stormwater Planning Committee (SWPC), as established by the City Council. The SWPC was to be involved with developing the community outreach program, participating in the selection of the consultant team, developing decision criteria for evaluation of options, overseeing technical work required for the plan, preparing draft and final plans, and making recommendations to the Council. The SWPC took a lead role in public outreach, including collecting citizen comments, identifying key public objectives and values to guide the planning, contributing to the selection and design of communications tools, facilitating public forums, and weighing the results of citizen feedback. In addition, the SWPC participated in the review and development of Chapters 1-5 of the SWMP and the development of policy recommendations.

Chapter 2 provides a detailed description of the public involvement process. The results of public meetings and surveys are summarized in Appendix A.

1.5.2 Collection and Development of Technical Resources

The recommendations provided by this SWMP are based in part on the physical characteristics of the City and surrounding study area. Information on rainfall quantity, intensity, and duration; soils; geology; topography; creek and storm conveyance system; land-use; and other physical factors were provided by the City or were obtained from other public-domain sources.

In addition, development of the SWMP involved conducting a field assessment of the existing channel and bank conditions at selected locations in each basin within the UGB. Locations were selected based on input from the SWPC and City staff, and a review of aerial photographs, maps, and information provided by the City (e.g., complaint and maintenance records). The first objective of the assessment was to characterize the general condition of the streams by noting items such as channel geometry, bank and bed stability, general floodplain functionality, vegetation and canopy, instream habitat, erosion and deposition, and accessibility for construction and maintenance.

Areas that presented opportunities for both immediate and long-term urban stream restoration, early action, and stewardship projects were also documented in the field notes from the stream observations. The City and SWPC were to consider applicable early action projects to be implemented while the SWMP was under development. Projects that might impact downstream conditions or that might have a large financial impact on the City were deferred for consideration and addressed during the development of the watershed plans found in Chapters 6 through 13.

Detailed results of the field investigations are available in Appendix B.

1.5.3 Modeling and Technical Studies

Models of the existing and future hydrologic conditions were constructed, tested, and run for each stormwater basin. The modeling addressed the main-stem open drainage and piped components of the stormwater system within the UGB. The existing land use was based in part upon review of digi-

tized aerial photographs made available by City staff at the start of the project. Future scenarios were modeled using the full-buildout future land use condition, provided for in the City's Comprehensive Plan. Additionally, photogrammetric information from the City's geographical information system was used to estimate imperviousness for existing land uses. The models were used to identify problem areas and to provide an analysis tool during the alternatives analysis phase.

Technical Memorandum No. 1 in Appendix C summarizes the modeling process and lists the results of the modeling.

1.5.4 Alternatives Analysis

The alternatives analysis included analyzing the results of the public involvement, field investigation, and modeling tasks. It identified problem areas and proposed potential solutions. The City and the SWPC were involved during this stage to assist in crafting solutions that reflected the goals and values of the community.

1.5.5 The Plan

The City's existing stormwater planning documents are in need of significant review and updating to provide the necessary foundation for decisions related to the stormwater system and to future land use and development. The SWMP outlines the development of a new master plan for the planning, management, engineering, development, and regulation aspects of the City's stormwater utility for all areas within the Corvallis UGB. The new master plan incorporates environmental restoration and protection of the natural components of the stormwater utility.

The SWPC created the following evaluation criteria list that was used to guide the development of the new master plan.

- Maintains and accommodates natural hydrological processes.
- Protects and improves water quality.
- Protects and restores natural resources and ecosystem functions.
- Controls unwanted erosion.
- Meets current regulations and anticipated future regulations.
- Implements urban and rural land use objectives.
- Minimizes maintenance requirements and allows for maintenance access.
- Is designed and managed to avoid public health and safety hazards.
- Ensures that cost considerations are inclusive.
- Addresses cumulative impacts and off-site impacts.
- Explores and uses innovative and low technology approaches.
- Incorporates community awareness.

The SWMP integrates the broader watershed and its functional elements and processes into stormwater planning and implementation. Streams that were once viewed solely as water conveyance systems are seen as an integral part of the community's ecological health. Watershed planning is intended to provide a unified stormwater management strategy that will address water quality, water quantity, uplands natural resource and wetlands management, floodplain and stream-system management, and cross-jurisdictional basin management.

1.6 ORGANIZATION OF THE SWMP

The SWMP is organized as follows:

Executive Summary - Provides a brief summary of the SWMP in the form of a final project transmittal letter.

Chapter 1: Introduction - Describes the authorization and purpose, background, objectives, and processes for developing the SWMP.

Chapter 2: Public Involvement - Describes the major elements of the public involvement and outreach processes along with a summary of the results.

Chapter 3: Basis of Planning - Describes the basis for hydrologic and hydraulic modeling, the engineering standards to be used in developing alternatives, methods for estimating project costs, strategies used for developing improvement programs, and a summary of the regulations impacting the SWMP.

Chapter 4: Study Area Characteristics - Describes the physical characteristics of the study area, including geography, land use, geology, soils, climate, rainfall, and a description of the conveyance system.

Chapter 5: Community-Wide Stormwater Planning and Policies - Summarizes the existing planning framework and presents recommended policies for addressing the major issues that impact stormwater management within the City.

Chapters 6 - 13: Watershed Planning and Analysis - Describes the physical characteristics of the following watersheds, summarizes the major findings from the public process, documents City experience in the area, presents deficiencies in the conveyance system as identified by modeling, identifies problem areas, and recommends projects and activities to address deficiencies and to protect water quality, the creek, and natural resources in the area.

Chapter 6: Dixon Creek

Chapter 7: Squaw Creek

Chapter 8: Jackson/Frazier/Village Green Creeks

Chapter 9: Sequoia Creek

Chapter 10: Garfield Basin

Chapter 11: Oak Creek

Chapter 12: Marys River

Chapter 13: South Corvallis

Chapter 14: Implementation Plan - Summarizes the recommendations from all of the watershed chapters in terms of cost for the short- and long-term programs, identifies capital improvement and operating program costs, and discusses the next steps required for funding the SWMP.

Technical Appendices - Presents background and detailed information on the project, including stormwater-related regulations, public involvement process, summary of the streamwalk observations, a technical memorandum on the hydrologic/hydraulic modeling, technical memorandum describing the basis of costs, and other related information.