

CHAPTER 1 – INTRODUCTION



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1.1 OBJECTIVE AND PURPOSE

Development projects in urban areas generally result in the replacement of open land, where rainfall can infiltrate into the soil, with impervious surfaces that prevent infiltration. This changes the patterns of stormwater runoff, which can lead to flooding problems—at the project site and on properties downstream—and can affect water quality, as sediment and pollutants are transported into streams, wetlands, lakes and groundwater.

The *Spokane Regional Stormwater Manual* establishes standards for stormwater design and management to protect water quality, natural drainage systems and down-gradient properties as urban development occurs. The Manual meets or exceeds applicable criteria from the Washington State Department of Ecology’s *Stormwater Management Manual for Eastern Washington* (SWMMEW), available online at www.ecy.wa.gov/programs/wq/stormwater/tech.html, for underground injection and discharge to surface waters.

The purpose of this Manual is to help communities in the Spokane region to protect water quality, prevent adverse impacts from flooding, and control stormwater runoff to levels equivalent to those that occurred prior to development. Acceptable stormwater management should be achieved when the criteria and standards presented in this Manual are met.

1.2 VISION STATEMENT

The *Spokane Regional Stormwater Manual* was developed jointly by Spokane County and the Cities of Spokane and Spokane Valley, whose vision is to provide a document with clearly defined stormwater management design and maintenance criteria to serve the current and future stormwater needs of the Spokane region. The criteria in this document are meant to enhance and promote future development in a way that reasonably protects the health, safety, and welfare of current and future property owners, while at the same time preserving or enhancing the existing natural drainage systems.

1.3 USING THE STORMWATER MANUAL

This Manual provides engineers, developers and the general public with procedures and assistance for designing stormwater management facilities associated with land development, road and drainage projects. It outlines minimum requirements for the design of stormwater management systems. The Manual is sufficiently comprehensive that its contents, along with good engineering judgment, will address the myriad of drainage concerns in the Spokane region.

The Manual provides essential information for development project proponents (owners or their agents) in two key areas: technical guidelines and government policies.

1.3.1 TECHNICAL INFORMATION

Technical information in this Manual consists of design criteria and minimum requirements for use in the analysis and design of specific stormwater management facilities. The technical information is generally organized to match eight basic requirements for stormwater management associated with development:

- Chapter 2 generally describes the eight basic requirements.
- Chapter 3 describes requirements for a “drainage submittal” that verifies compliance with all applicable requirements for a given project (Basic Requirement No. 1).
- Chapter 4 describes geotechnical requirements (Basic Requirement No. 2).
- Chapter 5 describes procedures for hydrologic analysis that are to be used in conjunction with several of the basic requirements.
- Chapter 6 describes requirements for water quality treatment (Basic Requirement No. 3).
- Chapter 7 describes requirements for flow control (Basic Requirement No. 4)
- Chapter 8 describes requirements for conveyance systems (Basic Requirement No. 5).
- Chapter 9 describes requirements for erosion and sediment control (Basic Requirement No. 6).
- Chapter 10 describes requirements for controlling sources of pollutants (Basic Requirement No. 7).
- Chapter 11 describes maintenance requirements (Basic Requirement No. 8).

In general, each chapter describes minimum requirements for compliance with this Manual and explains design procedures and criteria. Appendices to many of the chapters give example calculations to demonstrate procedures for facility analysis and design. Full compliance with this Manual may require exceeding the minimums presented in the chapters.

The Manual is intended to provide project proponents, regulatory agencies, and others with technically sound stormwater management practices which are *presumed* to meet the stated stormwater objectives of federal, state and local regulations. Project proponents always have the option of not following the stormwater management

practices in this Manual. However, if a project proponent chooses not to follow the practices in the Manual then the project proponent may be required to individually *demonstrate* that the project will not adversely impact surface waters, groundwater or neighboring properties by collecting and providing appropriate supporting data to show that the alternative approach satisfies all relevant stormwater regulations.

It is the intention of this Manual that project proponents who fully comply with all its requirements will also be in compliance with the requirements of Ecology's *Stormwater Management Manual for Eastern Washington*. Some of the requirements and definitions presented in this Manual are established by Ecology's manual, and future changes to Ecology's manual may affect these requirements and definitions. It is the obligation of the project proponent to refer to the most recent version of the Ecology manual as needed to ensure compliance with its requirements.

1.3.2 POLICY INFORMATION

The policy portions of this manual explain the conditions under which projects are subject to the requirements of this Manual and outline the procedures that are to be followed to ensure compliance. Development that affects stormwater management is subject to requirements laid out in federal, state and local rules and regulations. The Manual identifies the key sources of these rules and regulations and describes the steps toward compliance or directs users of the Manual to other resources for compliance information. Policy information is included throughout the Manual as appropriate.

This Manual was jointly developed by Spokane County and the Cities of Spokane and Spokane Valley. It generally applies to development projects in unincorporated County areas or within the limits of the two cities. It is not intended for use outside Spokane County or in incorporated areas of the County other than Spokane and Spokane Valley. Developers of projects in other jurisdictions should contact those jurisdictions for guidance.

1.4 RELEVANT PROGRAMS AND CONCEPTS

A number of regulatory programs and technical concepts are more broadly relevant to the goals of this manual than specifically applicable to individual requirements or procedures. Brief discussions of these topics are presented below to familiarize users of the Manual with their history and implications.

1.4.1 UNDERGROUND INJECTION CONTROL PROGRAM COMPLIANCE

Stormwater can contain contaminants such as oil, grease, pathogens, nitrates, pesticides, and metals such as cadmium, chromium and lead. When stormwater is infiltrated into the ground through underground injection facilities such as drywells, these contaminants can pollute groundwater.

The U.S. Congress created the Underground Injection Control (UIC) Program to protect underground sources of drinking water from discharges of fluids to the ground. The UIC Program in the State of Washington is administered by the Department of Ecology. To implement the program, the Department of Ecology adopted Washington Administrative Code (WAC) Chapter 173-218—Underground Injection Control in 1984. The two requirements of the UIC Program are as follows:

- Register UIC wells with the state.
- Ensure that current and future underground sources of groundwater are not endangered by pollutants in the discharge (non-endangerment standard).

Pollution of groundwater from stormwater discharges can be prevented by proper design, siting, operation and maintenance of the UIC well, by the use of treatment before discharge to the sub-surface, and by reducing the stormwater contact with potential sources of contamination.

The entire Spokane region is subject to the Department of Ecology’s UIC regulations.

1.4.2 SPOKANE VALLEY-RATHDRUM PRAIRIE SOLE-SOURCE AQUIFER

Aquifer Description and Potential Water Quality Threats

The only source of water for most of the people in Spokane County, Washington and Kootenai County, Idaho is a high quality underground water body called the Spokane Valley-Rathdrum Prairie Aquifer. This aquifer extends across an area of about 325 square miles and provides drinking water for more than 500,000 people. Most of the developed areas in the Spokane region and in North Idaho lie directly over the aquifer.

Unlike many other aquifers, the Spokane Valley-Rathdrum Prairie Aquifer does not have protective layers of clay or rock to deter infiltration of surface contaminants. The soil layer above the aquifer is relatively thin in most areas, and fluids readily infiltrate into the porous sands and gravel that make up the aquifer materials. Potential contamination is the most important issue that must be addressed to preserve and maintain the aquifer as a regional drinking water resource. A contaminant on the

surface may reach the aquifer water table in a matter of hours or days, particularly contaminants that are dissolved in water that is recharging the aquifer. Contamination in the aquifer may be cleaned up, or remediated, but the clean-up process is costly and does not eliminate 100% of the contamination.

The water quality of the aquifer has been tested since 1977 and the monitoring suggests that human activities on the land surface over the aquifer are deteriorating the water quality. Contaminants are conveyed to the aquifer by stormwater, septic tank leachate, fertilizer leachate, leakage from underground storage tanks and other sources that percolate downward from the surface. Stormwater accounts for about 30% of the pollution reaching the aquifer. Stormwater can collect a large variety of contaminants as it flows across roads, parking lots, roofs and other impervious surfaces. Pollutants such as coliform bacteria, nitrates and volatile organic compounds have been detected in aquifer water samples.

Regulatory Steps to Protect the Aquifer

Sole-Source Aquifer Designation: One of the first important steps to protect the aquifer was taken by the U.S. Environmental Protection Agency (EPA) in 1978 when it designated the Spokane Valley-Rathdrum Prairie a “Sole-Source Aquifer” under Section 1424(e) of the federal Safe Drinking Water Act. It was the second aquifer in the nation to receive this designation.

Aquifer Sensitive Area: Groundwater recharge areas have critical impacts on aquifers used for potable water, as defined by 365-190-030 (2) WAC. Incorporated areas of Spokane County, including the Cities of Spokane and Spokane Valley, are subject to regulations governing the Aquifer Sensitive Area (ASA), as described in Section 6.2.1.

Critical Aquifer Recharge Areas: By Resolution No. 3-0754, Spokane County has designated Critical Aquifer Recharge Areas (CARA) for the protection of aquifer water quality. Requirements associated with this designation affect all unincorporated areas of the County. Section 6.2.2 provides detailed information about the CARA designation.

1.4.3 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM COMPLIANCE

The National Pollutant Discharge Elimination System (NPDES) permit program was established by the federal Clean Water Act, which is the primary federal law protecting water quality. The Water Pollution Control Act (Revised Code of Washington (RCW) Chapter 90.48) is the primary Washington State law protecting water quality. The Washington Department of Ecology issues and implements combined permits for point source stormwater and wastewater discharges to waters of the United States and waters of the state that are designed to satisfy requirements of

the NPDES and the Water Pollution Control Act. “Waters of the state” means all lakes, rivers, ponds, streams, inland waters, ground waters, salt waters, and all other waters and water courses within the jurisdiction of the state of Washington (Washington Administrative Code (WAC) Chapter 173-216-030(20)).

In December 1999, the U.S. EPA adopted NPDES Phase II stormwater regulations, identifying municipalities that are subject to NPDES municipal stormwater permitting requirements. Federal regulations required that Phase II permits be issued by December 2002 and that designated Phase II communities submit an application for permit coverage by March 2003. The Department of Ecology issued the *Eastern Washington Phase II Municipal Stormwater Permit* on January 17, 2007, effective February 16, 2007, which applies to Spokane County and the Cities of Spokane and Spokane Valley. The Phase II Permit requires the development of a Stormwater Management Program (SWMP).

This Manual is intended to be technically equivalent to the Department of Ecology’s *Stormwater Management Manual for Eastern Washington* in order to meet the NPDES requirements for both permitted and non-permitted communities in Spokane County.

1.4.4 POLLUTANT GENERATING IMPERVIOUS SURFACE

Pollutant generating impervious surface (PGIS) areas are significant sources of pollutants in stormwater runoff. These areas include surfaces subject to vehicular use, industrial activities, or storage of erodible or leachable materials that receive direct rainfall. The following are considered PGIS areas: roads, unvegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, hydraulically connected sidewalks, parking lots, some roofs, fire lanes, vehicular equipment storage yards and airport runways. Please refer to Section 6-4.

1.5 GENERAL REQUIREMENTS

The owner or project proponent and his agent are responsible for the following:

- Coordinating project consultants
- Providing complete drainage submittals
- Ensuring adherence to:
 - The standards and criteria presented in this Manual
 - The Administrative Conditions of Approval, if applicable
 - Any conditions established by local jurisdiction staff
- General project management.

The owner or project proponent and his agent are required to obtain acceptance of the drainage submittal from the local jurisdiction prior to any of the following:

- Final plat approval
- Final short plat approval
- Binding site plan approval
- Issuance of a building permit
- Issuance of a road approach permit
- Any other land use action as defined by code, regulation or resolution of the local jurisdiction.

The drainage submittal shall be prepared in accordance with this Manual, the applicable version of the local jurisdiction's design standards, the International Building Code (IBC) and the International Residential Code (IRC). The submittal shall be prepared by a professional civil engineer currently licensed in the State of Washington and shall be submitted to the local jurisdiction for review and acceptance.

The rate and volume of stormwater runoff originating on any proposed land development, road or area draining to, across or through the project site shall be estimated in accordance with the criteria presented in this Manual. These estimates shall be the basis of the drainage report. Unless specifically approved by the local jurisdiction, the peak rate and volume of stormwater runoff from any proposed land development to any natural or constructed point of discharge downstream shall not exceed the pre-development peak rate or volume of runoff. A down-gradient analysis demonstrating that there will be no expected adverse impacts on downgradient properties will be required. Exceptions with regard to rate and volume control can be made for regional facilities planned by the local jurisdiction.

Stormwater runoff from a developed site shall leave the site in the same manner and location as it did in the pre-developed condition. Flow may not be concentrated onto down-gradient properties where sheet flow previously existed. Drainage shall not be diverted and released downstream at points not receiving drainage prior to the proposed development.

1.6 STANDARD OF CARE

The standards presented in this Manual should be considered the minimum requirements to be used in the design of stormwater facilities. Due to special site conditions, environmental constraints, or other applicable laws, stormwater management designs may frequently need to exceed the minimum requirements. It is incumbent upon the engineer to use good engineering practice and to be aware of, and implement, new design practices and procedures that reflect current techniques in stormwater design, providing sufficient measures to ensure that the drainage facilities function as intended. Good

engineering practice is defined in these standards as professional and ethical conduct that meets the current codes and regulations adopted for engineers. The proposed design shall consider functionality, constructability and maintenance, including the health, safety and welfare of the public.

1.7 SEVERABILITY

If any section, sentence, clause or phrase of this Manual should be held invalid or unconstitutional, the validity or constitutionality thereof shall not affect the validity or constitutionality of any other section, sentence, clause or phrase of this Manual.