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# Central Oregon Stormwater Manual

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Updated August 2010



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# Central Oregon Stormwater Manual

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Developed in Conjunction With:

Crook County  
Deschutes County  
City of Bend  
City of Madras  
City of Prineville  
City of Redmond  
City of Sisters

Oregon Association of Clean Water Agencies  
Central Oregon Community Investment Board



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# FOREWORD

## OBJECTIVE AND PURPOSE

Urban development has been shown to cause changes in patterns of stormwater runoff that can affect water quality through sediment and pollutant transport into streams, wetlands, lakes and groundwater, and can also lead to negative downstream and onsite impacts if not managed properly.

The development of the Central Oregon Stormwater Manual (COSM) has been organized by the Central Oregon Intergovernmental Council and sponsored by the Cities of Bend, Madras, Prineville, Redmond and Sisters, and Crook and Deschutes Counties. Representatives from each agency have taken an active role in outlining goals for the COSM, reviewing technical content, and writing manual chapters in a process that has spanned more than five years and two editions. It is our hope that this collaborative process between Central Oregon cities and counties will provide regional standardization of stormwater design processes, and in turn protect the water quality of our streams, rivers and regional aquifer.

Pioneering work was done in the State of Washington resulting in the Eastern Washington Stormwater Manual, and then in the development of the Spokane Regional Stormwater Manual. The Spokane Regional Stormwater Manual was the starting point for the COSM. We are deeply grateful to all of those who contributed to the work in Washington State and made preparation of the COSM so much easier. In addition, we greatly appreciate the hard work and expert advice of Otak, our consultant on the COSM project, in guiding the adaptation of the Spokane Manual and producing the August 2010 update to the COSM.

The goal of this stormwater manual is to provide local engineers, developers, builders and agencies clear guidance and design standards on stormwater conveyance and treatment systems that are appropriate to our local climate, hydrogeology and geology. For example, required hydrology calculations include a snowmelt/frozen ground factor that results in larger sized facilities than would be found in more temperate areas.

The manual is intended to assist the development community with meeting the requirements for stormwater surface discharge and Underground Injection Control (UIC) water quality requirements outlined by the Oregon Department of Environmental Quality (DEQ). DEQ Stormwater and UIC staff conducted a full review of the manual and provided valuable comments and guidance towards the completion of the August 2010 update. Please see attached letter of review from DEQ.

The COSM contains minimum local requirements and standards for designing stormwater management systems within Central Oregon. The requirements apply to land development and municipal road and drainage projects in both urban and rural settings. The COSM contains procedures and assistance in the design of stormwater management facilities. It is not intended to be a textbook on hydrology or hydraulic engineering, nor is it an attempt to cover every scenario that may arise. It is intended to be sufficiently comprehensive so that its contents, along with good engineering judgment, will address the myriad drainage concerns in Central Oregon.

Where applicable, the COSM is intended to meet the intent of DEQ's design criteria for both underground injection control and discharge to waters of the state. It provides guidance on how to design stormwater management systems that meet DEQ's rule authorization requirements for underground injection of stormwater and reduce, to the maximum extent practicable (MEP), pollutants discharged to surface waters.

However, this Manual only addresses an important subset of DEQ requirements related to stormwater and underground injection. This manual is a reference to help facilitate regulatory approval. Compliance with the requirements in this Manual does not guarantee DEQ approval of projects. Project proponents should still familiarize themselves with all DEQ requirements and be prepared to comply with those requirements. DEQ's UIC rules are found in OAR 340-044.

As of August 2010, the City of Bend is the only municipality in Central Oregon subject to federal NPDES Phase II permit requirements for stormwater discharges to the Deschutes River. For at least the term of this Phase II NPDES MS4 Permit (i.e. until March 2012), the City of Bend has determined that the same requirements that apply to stormwater discharges underground will apply to river discharges. Therefore, compliance with this Manual should ensure compliance with both the UIC and Phase II Permit requirements.

The purpose of this Manual is to assist the community in achieving the overall goal of protecting water quality and receiving waters, and managing stormwater runoff to prevent adverse impacts from flooding and increased flows. It is presumed that when the criteria and standards found in this Manual are applied (which may require exceeding the minimums stated), runoff should comply with water quality standards and receiving waters should be protected against adverse impacts. Project proponents always have the option of pursuing other stormwater management practices not found in this Manual. However, the project proponent may be required to demonstrate that the stormwater management facilities proposed for the project will be able to achieve or exceed the goals set forth in the COSM.

Cities across the United States are using Low Impact Development (LID) techniques to reduce the discharge of contaminated stormwater to local water bodies and to maintain natural drainage patterns and hydrographs. LID facilities can frequently be less costly and less space consuming to construct and less costly to operate and maintain than traditional stormwater management facilities. The cities and counties of Central Oregon encourage project proponents to consider ways to incorporate LID techniques into their project designs. Chapter 11 has been included in the COSM to assist with adoption of LID techniques.

## VISION STATEMENT

Our vision is to provide a document with clearly defined stormwater management design and maintenance criteria that will serve the current and future stormwater needs in Central Oregon. 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 and/or enhancing the existing natural drainage systems.

## MANUAL UPDATES

The Manual is a living document. Comments and suggestions are welcome and should be sent by e-mail to Phil Chang, COIC Program Administrator, at [pchang@coic.org](mailto:pchang@coic.org). The Manual will be updated periodically as new information becomes available. Visit [www.coic.org/stormwater](http://www.coic.org/stormwater) for update information.

The August 2010 update was completed following a public survey to solicit comments from the local engineering and development community. At the same time, DEQ staff in the Stormwater and UIC programs conducted a full review of the manual and provided valuable comments and guidance toward the completion of this update. DEQ's letter of review is attached.

Significant changes were made during this update to better define the requirements and regulations for underground injection control facilities. The current version of the manual also includes a drainage submittal checklist (Chapter 3), updated intensity-duration-frequency curves for Bend, Redmond, and Prineville developed by the Oregon Climate Service (Chapter 5), a new plant selection appendix (Chapter 7), an erosion and sediment control inspection checklist (Chapter 9), and new maintenance standards checklists (Chapter 12). A more comprehensive summary of the changes made during this manual update can be found on the COIC website.

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