Underground Injection Control Management Plan

City of Keizer, OR

August 2013

Prepared By:

City of Keizer
Stormwater Division Personnel

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date 8/28/13

Bill Lawyer
Public Works Director
City of Keizer, OR

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ACRONYMS

ACWA	Association of Clean Water Agencies
BMP	Best Management Practice
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CITY	City of Keizer
CWA	Clean Water Act
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
GIS	Geographic Information System
GPS	Global Positioning System
IDDE	Illicit Discharge Detection and Elimination
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System (permit)
O & M	Operations and Maintenance
OAR	Oregon Administrative Rule
OWRD	Oregon Water Resources Department
PE	Public Education
PERP	Protectiveness Evaluation and Response Process
PI	Public Involvement
Revised SWMP	Document submitted to DEQ in August 2011 as part of the NPDES Renewal Package
SARA	Superfund Amendments and Reauthorization Act
SPRP	Spill Prevention and Response Plan
SWAC	Stormwater Advisory Committee
SWDA	Safe Drinking Water Act
SWMP	Stormwater Management Plan for the NPDES permit
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control (device)
UICMP	Underground Injection Control Management Plan
WPCF	Water Pollution Control Facilities (permit)

Section ES: Executive Summary

The purpose of the City of Keizer Underground Injection Control (UIC) Management Plan (UICMP) is to meet state and federal safe drinking water requirements within Keizer. Furthermore, the UICMP was developed to identify City activities that will protect groundwater as a source of drinking water, and implement activities that ensure proper management of the stormwater system.

The UICMP was developed as an extension to the City's overall stormwater management program. This management plan will build on the existing best management practices (BMPs) established with the first Stormwater Management Plan (SWMP) for Keizer's National Pollutant Discharge Elimination System (NPDES) Phase II permit as well as the Revised SWMP. The Revised SWMP was submitted to DEQ in August 2011 with the NPDES permit renewal package. The City also implements the BMPs approved in the Total Maximum Daily Load Implementation Plan for the Willamette Basin.

Utilization of the BMPs in the Revised SWMP, UICMP, and TMDL Implementation Plan not only serve to protect water quality, but also address potential property damage from localized flooding, and potentially reduce stormwater system maintenance costs.

Many of the activities designed to protect surface water through the NPDES Phase II program are identical to the defensible BMPs that can be implemented to protect groundwater. While the City of Keizer has not yet integrated management plans for stormwater, utilizing and enhancing existing BMPs to provide both surface water and groundwater protection is the goal of this management plan.

The City of Keizer will look to complete integration of stormwater programs and management activities in the future. Keizer has chosen not to develop an integrated plan at this point given the path forward for the Phase II program is unclear. Merging the documents will be a more fluid process when the City has clear direction from DEQ for the NPDES permit which applies to the Municipal Separate Storm Sewer System (MS4).

Section 1 – Introduction

1.1 UIC Management Plan Purpose

The City of Keizer Underground Injection Control (UIC) Management Plan (UICMP) represents the guiding strategy to meet the requirements of the Water Pollution Control Facilities (WPCF) permit. The UICMP is the umbrella document for those components of the permit that ensure adequate system management, monitoring, and assessment in order to protect groundwater as a potential drinking water source.

The UICMP and its contents apply specifically to publically owned and operated Class V UICs unless otherwise specified.

The UICMP provides the foundation for the City of Keizer UIC Management Program. The goals of the program are to:

- Ensure that UICs are constructed, operated, and maintained in a manner that meets WPCF permit requirements, protects groundwater as a drinking water resource, and that meets state and federal drinking water requirements.
- Manage stormwater by utilizing operating facilities that support the natural hydrogeologic cycle, reduce direct discharge to waterways thereby restoring normal stream flow, and recharge groundwater providing baseflow for streams.
- Collect stormwater data that is representative of the overall UIC system to identify where system improvements are needed.
- Implement a program this is fiscally defensible for the citizens of Keizer.

1.2 Regulatory Requirements

The City of Keizer has developed this UICMP to meet the requirements of the WPCF permit issued to the City in October 2013. The City has approximately 86 publicly owned UICs. As used in this document, UIC refers to Class V underground injection control devices owned or managed by the City of Keizer.

The United States Congress enacted UIC rules in 1974 under the federal Safe Drinking Water Act (SDWA) and modified the rules in 1999. The Environmental Protection Agency (EPA) administers these rules under Title 40 of the Code of Federal Regulations (CFR) Parts 144-148. In Oregon, the EPA has delegated the regulation of UICs to the Department of Environmental Quality (DEQ). Oregon Administrative Rules (OAR) 340-044 regulate all groundwater as a potential source of drinking water and require municipalities with more than 50 UICs to operate under a WPCF permit.

1.3 UIC Management Plan Organization

The UICMP is required in Schedule B(2) and Schedule D(5) of the WPCF permit. Schedule D(5) specifies the elements that must be implemented in order to protect groundwater quality which includes the following:

a. A stormwater monitoring plan
b. An injection system decommissioning process
c. Employee education and public outreach
d. An injection system operation and maintenance plan
e. A process to protect injection systems from accidental spills or illicit disposal of wastes or contaminants
f. A process to prevent injection of stormwater from loading docks, refueling areas, areas of hazardous and toxic material storage or handling, materials storage or handling areas, or other discharges that may contain pollutants above levels of concern
g. Implementation of good housekeeping practices
h. Facility designs or practices that allow blockage of discharge into any UIC in the event of an accident, spill, or emergency fire-fighting activity

Furthermore, Schedule D(5) specifies that the permittee must implement the DEQ approved management plan and approved updates.

1.3.1 Existing Stormwater Programs and Their Relationship to the UICMP

The City of Keizer is a National Pollutant Discharge Elimination System (NPDES) permit holder. Permit #102904 was issued in March 2007. As is required in the NPDES permit, the City submitted a permit renewal application in August 2011. Furthermore, the City is a Designated Management Agency (DMA) for the Willamette Basin Total Maximum Daily Load (TMDL). DEQ approved the City's original TMDL Implementation Plan in April 2008.

The UICMP was organized in a manner that incorporates the principles and best management practices (BMPs) of the NPDES program and the TMDL Implementation Plan. Under Phase II Municipal Separate Storm Sewer System (MS4) rules, the permittee must address 6 minimum control measures in its Stormwater Management Plan (SWMP). Because there is some overlap in programmatic elements, the UICMP was developed utilizing the 6 minimum control format as well as incorporation of additional categories that meet the requirement of the WPCF permit.

As was noted above, the City of Keizer submitted a NPDES permit renewal application to DEQ in August 2011. That package included a Revised SWMP. In addition, the TMDL Implementation Plan was revised in December 2012. The TMDL Implementation Plan was designed to operate in concert with the NPDES SWMP, although it does contain some unique BMPs. The Revised SWMP is attached as Appendix A. The TMDL Implementation Plan Matrix is attached as Appendix B.

For the purpose of this document, SWMP shall refer specifically to the original NPDES SWMP. The document submitted to DEQ in the permit renewal process is the Revised SWMP.

Sections 4 through 10 of the UICMP are organized according to the minimum control measures referenced earlier. Each of those sections will discuss the current BMPs of the Revised SWMP and TMDL Implementation Plan that apply to measures for groundwater protection and this management plan as a whole. Any new BMPs that specifically address the requirements of the WPCF permit and UICMP will be included in the appropriate section. A measureable goal and implementation timeline will be included for all new BMPs. For existing BMPs, the timeline established in the Revised SWMP or TMDL Implementation Plan will apply.

The City of Keizer intends to use the Revised SWMP as its core stormwater document at this time. The City has not truly developed an integrated management plan due to the unclear path forward for renewal of the NPDES permit. However, the UICMP has been developed in a manner to facilitate that update at some point in the future. When the documents can be integrated the Revised SWMP format will be utilized. More detail is provided Section 2.2 in regard to annual reporting and Section 2.3, adaptive management.

As a point of clarification, the Revised SWMP contains some of the original BMPs approved under the first NPDES permit, and some new BMPs. In addition, some of the original BMPs from the SWMP have been elevated. The City of Keizer is confident that DEQ will make very minor adjustments to any new or elevated BMPs. See Section 2.3.1 for a more detailed discussion on adaptive management activities currently underway for the Revised SWMP.

The format for Sections 4 through 10 are as follows:

X.1 Regulatory Requirements
As they pertain to the WPCF permit

X.2 Existing BMPs and Programs
NPDES SWMP and TMDL Implementation BMPs that apply to groundwater protection and UIC operation

X.3 New BMPs and Rationale
WPCF permit specific BMPs and associated rationale

X.4 Measureable Goals and Timeline
Measureable goals and timeline for new BMPs

The UICMP is organized as follows:

Section 1 – Introduction: This section describes the purpose of the UICMP, regulatory requirements, and a description of the organization of the Plan and its relationship to the Revised SWMP and TMDL Implementation Plan. Section 1 also includes a description of the relationship of the UIC program to other stormwater documents and activities within the Keizer organization.

Section 2 – Program Administration/Planning: Section 2 provides the legal authority measures referenced in the WPCF permit, it includes an overview of annual reporting specifications, and it discusses the City's approach to adaptive management. The section also includes a table of City personnel responsible for program implementation.

Section 3 – System Description/Management Procedures: This section describes the community, associated demographics, and the stormwater system. It includes a description of the MS4 in relation to the stormwater system as a whole. Section 3 includes the overview of the decommissioning process and an overview of the systemwide assessment. Finally, the section includes a description of the Protectiveness Evaluation and Response Process (PERP) which is a decision matrix for those UICs that do not automatically fall into the protected UIC category.

Section 4 – Public Outreach: See Subsection 1.3.1

Section 5 – Public Involvement: See Subsection 1.3.1

Section 6 – Illicit Discharge Detection and Elimination/Spill Prevention and Response: In addition to the information listed in Subsection 1.3.1, Section 6 also includes an overview of the City's Spill Prevention and Response Plan (SPRP) including a discussion on employee training.

Section 7 – Construction Site Stormwater Activities: See Subsection 1.3.1

Section 8 – Post Construction Stormwater Management in New and Redevelopment: See Subsection 1.3.1

Section 9 – Operations and Maintenance In addition to the information listed in Subsection 1.3.1, Section 9 provides an overview of the Operations and Maintenance Plan.

Section 10 – Good Housekeeping: In addition to the information listed in Subsection 1.3.1, Section 10 includes an overview of the Good Housekeeping Manual.

Section 11 – Recordkeeping: Section 11 discusses the City's current stormwater related recordkeeping activities and those that will be undertaken for implementation of the UICMP.

Section 12 - Monitoring: Section 12 includes the regulatory requirements for monitoring and an overview of Keizer's UIC monitoring program.

The **Appendices** to this UICMP contain the following documents:

Appendix A	Revised (NPDES) SWMP
Appendix B	TMDL Implementation Plan Matrix
Appendix C	Systemwide Assessment
Appendix D	Decommissioning Plan

Exhibit A	Monitoring Plan

Section 2 – Program Administration/Planning

2.1 Legal Authority

According to Schedule D(1) of the WPCF permit, the *permittee must adopt and maintain, through ordinance or other means, adequate legal authority to implement and enforce the provisions of the permit. At a minimum, the legal authority must enable the permittee to:*

- *Implement the DEQ-approved Stormwater Monitoring Plan and Underground Injection Control System Management Plan required in Schedule B, condition 2 and Schedule D, condition 5;*
- *Prohibit discharge to an underground injection system that may cause a violation of the conditions of this permit from publicly or privately owned properties; and*
- *Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with the conditions of this permit.*

The City's Stormwater Advisory Committee (SWAC) has had an opportunity to review and hear staff's recommendation for development of the document. That meeting was held on July 24, 2013. In addition to the DEQ public comment period, the UICMP will go before City Council to be adopted by resolution prior to January 1, 2014

2.2 Reporting

Schedule B(4) of the WPCF permit requires annual reporting. The annual reporting period for the City of Keizer will be for the fiscal year July 1 to June 30 of each year. The City will submit annual reports to DEQ by December 31st of each year. Annual reporting will commence as indicated by DEQ in the WPCF permit.

The annual report will include:

a. The results of stormwater monitoring conducted in accordance with the stormwater Monitoring Plan. Sampling data from UICS will be provided in the analytical laboratory reports;

b. A discussion of any Table 1 action level exceedances and actions taken to address the exceedances;

c. A description of any actions taken to implement the UICMP, any proposed modifications, and any additional actions taken to manage injection systems to ensure groundwater protection;

d. A description of any actions described in the UICMP that the City was unable to complete and why;

e. Identification of any public injection systems that were closed, retrofitted, or installed during the year;

f. A description of future (the next year) known plans to install, modify, convert, or close any UIC;

g. One hard copy and one electronic copy of the annual UIC report to DEQ. Copies of laboratory results will be retained by the City according to WPCF permit specifications

Other reporting elements required in the WPCF are included in the UIC Monitoring Plan which is discussed in Section 11 and attached as Exhibit A.

2.2.1 Annual Reporting / Relationship of Existing Stormwater Programs

The NPDES Phase II permit requires annual reporting as does the City's TMDL Implementation Plan. As was noted in Section 1, both of these programs have a number of overlapping BMPs. In order to reduce the redundancy of the regulatory review of similar programs, the TMDL Implementation Plan yearly report is included in a Section of the NPDES annual report. TMDL information is also captured in a matrix showing overall TMDL progress. Incorporation of the TMDL Implementation Plan yearly report with the NPDES annual report is an efficient way to review overall stormwater programmatic progress.

The City of Keizer is not proposing integrating the WPCF annual report into this format at this time. However, as was covered in Section 1, the City intends to use the Revised SWMP as the core document. As such, the WPCF annual report will reference the NPDES annual report and include the document or appropriate sections as an appendix in the WPCF annual report. Again, the City believes this will be the most efficient way to tie Keizer's stormwater programs together at this point.

2.3 Adaptive Management

Schedule F(6) of the WPCF permit requires *an adaptive management approach to assess annually, and modify as necessary, any or all existing UICMP components, and adopt new or revised UICMP components to ensure the program is efficient and effective. The City must at least annually assess the need to further improve groundwater quality and protect groundwater beneficial uses, review of available technologies and practices, and review monitoring data and analyses as required in Schedule B, and evaluate resources available to implement the program.*

The City's NPDES permit also requires an adaptive management approach to assess options for improving controls on stormwater discharges. The Revised SWMP, which was submitted to DEQ in August 2011 with the NPDES permit renewal application, specified BMPs to ensure adaptive management was addressed.

Adaptive management is addressed under the Public Involvement BMPs in the Revised SWMP. In short, the City intends to continue to utilize the SWAC for annual review of both the UICMP and the Revised SWMP. Under BMP PI-1, the City has stated that it intends to utilize 5 phases of adaptive management for annual review. The 5 phases are as follows:

1. Program implementation
2. Data and information collection
3. Evaluation
4. Needs identification
5. Program modification

Annual review of management plans will be added to the SWAC meeting schedule prior to the end of the fiscal year in order to make any recommended changes that require approval from DEQ. A more robust adaptive management review will occur during the 5th year of permit implementation.

2.3.1 Adaptive Management Prior to Renewal of NPDES Permit

The Revised SWMP submitted to DEQ with the permit renewal package was developed in 2011. At this time the City has received no direction as to when permit renewal will occur or in what form. The City's stormwater program has continued to evolve and in doing so, staff have identified the need for adaptive management in BMPs listed in the Revised SWMP.

The City contacted the DEQ MS4 Technician who indicated that the City may apply adaptive management in the interim until the NPDES permit is renewed. The process will include proposing a revised BMP electronically or in writing to DEQ. DEQ may approve the BMP outside of the new permit. The MS4 Technician has indicated revised BMPs will be added to the permittee's file for inclusion at the time of permit issuance. As it applies to the WPCF permit, the City will include any BMP changes in the annual report including measureable goal status as well as timeline compliance. Because the Revised SWMP is a somewhat fluid document, and will be prior to permit issuance, the attached document will not represent the final approved Revised SWMP.

2.4 Implementation Schedule

The WPCF permit is a 10 year permit which will expire in 2023. As was covered in Section 1, the City of Keizer intends to utilize a similar format to the Revised SWMP. Sections 4 through 10 of the UICMP are formatted in a similar manner to the Revised SWMP. An implementation schedule is included for each BMP in the referenced Section. In addition, an implementation schedule is included in an UICMP Implementation Matrix at the end of this document. The Matrix will be submitted with the annual report to capture any adaptive management changes. Furthermore, the matrix will be fully evaluated and revised during the 5th year of plan implementation.

2.5 Responsible Personnel

The City of Keizer Stormwater Division is divided into two groups which includes a regulatory/technical group and a maintenance group. When the NPDES permit was issued in 2007, the Department first hired regulatory staff to implement the permit and the bulk of the BMPs listed in the SWMP. The existing Department had no experience with regulatory stormwater programs or the obligation of maintenance personnel to implement approved BMPs. While progress has occurred, the Department continues to look for tools that will strengthen

coordination between the regulatory/technical group and maintenance personnel. Under the leadership of a new Public Works Director the Department is undergoing growth and change.

Table 2.5 identifies key personnel positions and contact information for those staff members responsible for establishing and maintaining compliance with the conditions of the WPCF permit requirements. Contact information includes the employee's name, title, email, and phone number. The City will have quarterly meetings with responsible parties to make certain milestones are being met and the City remains in compliance with approved BMPs and measureable goals.

At present, the Stormwater Division staff is somewhat in flux and responsibilities have not been entirely solidified. The Responsible Personnel identified in this table may change over the upcoming months as the City welcomes a new employee and duties are assigned and reassigned with existing personnel. The Environmental Program Coordinator is the City's lead for regulatory stormwater program implementation, and will act as the point of contact for the components of this plan. The Responsible Personnel table will be updated annually to provide DEQ with the most current information.

Table 2.5 Responsible Personnel

Key Personnel	*Area of Responsibility*
Bill Lawyer, Public Works Director P.O. Box 21000 Keizer, OR 97307 (503)390-3700 lawyerb@keizer.org	Department Director Stormwater Budget Inter-Agency Lead Citywide Communication
Elizabeth Sagmiller, Environmental Program Coordinator P.O. Box 21000 Keizer, OR 97307 (503)856-3563 sagmillere@keizer.org	Management of Permitted Stormwater Programs Annual Reporting/Regulatory Reporting Stormwater Fiscal Analysis Operational Plan Development Maintenance/Repair Policy Development Recordkeeping Policy Development Community Education Inter-Agency Coordination
Kat LaFever, Senior Environmental Program Technician P.O. Box 21000 Keizer, OR 97307 (503)856-3526 lafever@keizer.org	Systemwide Assessment Monitoring Plan Data Analysis/Recordkeeping Stormwater GIS Management/Maintenance
Mike Griffin, Streets/Storm Field Supervisor P.O. Box 21000 Keizer, OR 97307 (503)856-3551 griffinm@keizer.org	Employee Training Implementation of Operations and Maintenance Plan Implementation of Good Housekeeping Plan Implementation of Spill Response Manual In-house Stormwater System Repairs Field Investigation and Response (IDDE, Spills)
Matt Reyes, Construction/Distribution Supervisor P.O. Box 21000 Keizer, OR 97307 (503)856-3558 reyesm@keizer.org	New UIC Installation New Construction UIC Decommission/Retrofits Contracted Stormwater System Repairs

Section 3 – System Description/Management Procedures

3.1 Community Overview / Demographics

The City of Keizer is located in Marion County, just north of the City of Salem, and is part of the Salem/Keizer Urban Area. Keizer incorporated in 1982. The population in 2013 was 37,215 according to the Oregon Blue Book. The City is operated by a City Council/City Manager structure. Elected officials include 6 Council members and the Mayor.

The City encompasses approximately 7.5 square miles, and is almost entirely built-out to the Urban Growth Boundary (UGB). Land use within Keizer is predominantly residential. There is some limited industrial zoned property, but no heavy industrial activity. New development within the community is primarily infill residential housing, with some new commercial development occurring near Interstate 5 at Keizer Station. The Willamette River flows along the western portion of Keizer from the south. Claggett Creek divides Keizer, flowing to the north from Salem. Labish Ditch follows a northern UGB boundary west to its confluence with Claggett Creek in the north central portion of Keizer. Claggett Creek intersects Clear Lake located in Marion County. This feature is a meander scar of the Willamette River. There is a surface water connection between the two features.

The City of Keizer utilizes groundwater for its municipal drinking water source. City well drain water from a minimum depth of 100 feet. Most of the City is moderately well drained with less interflow adjacent to confined waterways and elevation peaks. Much of the higher elevations around Keizer are comprised of lacustrine and fluvial sedimentary rocks (Walker, G.W., and MacLeod, N.S., 1991). Much of the lower portions of the city are comprised of alluvial deposits (Walker, G.W., and MacLeod, N.S., 1991).

3.2 Storm System Overview

The City is a Municipal Separate Storm Sewer System (MS4) Phase II community and obtained its National Pollutant Discharge Elimination System (NPDES) Permit #102904 in March 2007. The City submitted a permit application renewal package to DEQ in August 2011. The initial permit expired in February 2012. The City is waiting to negotiate conditions for renewal of the permit. City staff continue to implement the BMPs of the original SWMP as well as some of the new BMPs in the Revised SWMP.

The MS4 inventory at this time includes approximately 73 miles of solid pipe and 135 outfalls. There are approximately 2650 MS4 catchbasins within the community although the inventory may include some private catchbasins. Keizer has traditionally connected some UICs to the MS4 system. These devices are generally sections of shallow perforated pipe in areas where the role of the perf pipe is to either 1) decrease flow to the outfall, 2) provide a type of underground detention, or 3) both. A more detailed description of Keizer's UIC system is included in the Systemwide Assessment in Appendix C. Keizer operates 86 UICs. At least 19 of those were installed by Marion County prior to the City's incorporation in 1982.

3.3 Protectiveness Evaluation and Response Process (PERP)

Keizer entered into a contract with GSI Water Solutions Inc. in 2012. The scope of services called for a Groundwater Protectiveness Model. The results of the model will demonstrate that

some of Keizer's UICs that do not meet regulated well setback standards are actually protective of groundwater. The GSI process was approved by DEQ at a meeting with City staff in October 2012. The groundwater protectiveness demonstration is also discussed in the Systemwide Assessment. The Systemwide Assessment is attached in Appendix C.

As was noted earlier in this section, the City of Keizer incorporated in 1982. Because the City is relatively young, comprehensive recordkeeping and asset information for stormwater related infrastructure was not a consistent part of Public Works operations until about 2010. As part of asset building efforts the City added private water wells to the GIS database from the Oregon Water Resources Department (OWRD), to determine which UICs complied with the horizontal setback standards. Information collected by OWRD does not always provide exact well location and therefore, City staff electronically placed the well in the center of the subject property. No field work has been conducted to verify exact location or actual status of the well (e.g. active, abandoned, or closed).

Because limited research has been done in regard to privately owned water wells, it will be necessary for City staff to investigate well status for those wells that do not meet protective horizontal setbacks prior to following the procedures outlined in Schedule A(7) of the WPCF permit. In addition, there may be additional factors that should be considered such as the depth of water wells that do not meet protectiveness standards.

In order to provide a clear path forward for assessing UICs that are not deemed protective, Stormwater staff developed a process to follow after receiving the results of the groundwater demonstration. The field investigation and records search required for the initial assessment of water wells will be conducted by City staff. If it is determined that there are insufficient setbacks, the City will work with DEQ to determine if there are other means to demonstrate protection of groundwater. Failing to demonstrate protection of groundwater will result in the actions listed in Schedule A(7) of the WPCF permit.

City staff developed a process to evaluate new and existing UICs in order to ensure adequate separation to groundwater and horizontal setbacks. The Protectiveness Evaluation and Response Process (PERP) will be utilized by staff for existing and new UICs. The PERP is displayed in Figure 3.3.

The PERP is described in the following steps:

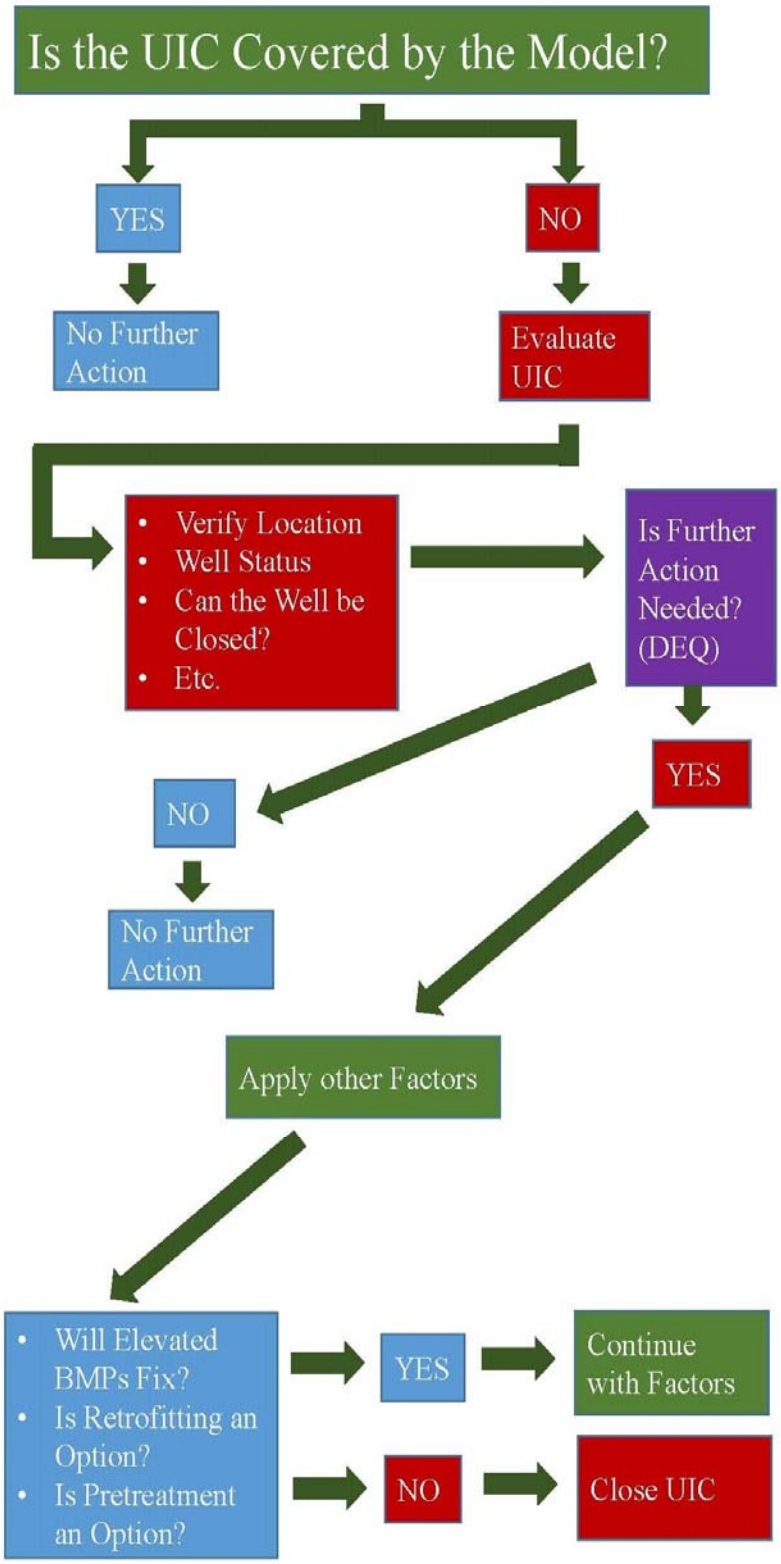
Step 1 – UICs not covered by the model will be evaluated by City staff to determine if there is another protectiveness measure that can be applied. Such examples might include field verification of wells or determining if the well is still active.

Step 2 – Those UICs for which the City cannot demonstrate protectiveness will be called the **Response Needed Group**. For this group the City will look at additional measures that may demonstrate protection. DEQ will be included in this process to approve any request by the City. Examples might include elevation of BMPs, or opportunities for some type of pretreatment or retrofits.

Step 3 –UICS that cannot demonstrate protection of groundwater will be decommissioned and closed.

Should closure be required, the City has included its UIC Decommisioning Plan in Appendix D.

Figure 3.3
Protectiveness Evaluation and Response Process



3.4 Systemwide Assessment Overview

The WPCF permit requires development of a Systemwide Assessment for UICs the City owns or operates. The Systemwide Assessment must be updated by the end of the fifth year of the permit term. The purpose of the Systemwide Assessment is to inventory, evaluate, assess and report on the location and physical characteristics of existing and new Class V UICs owned and operated by the City of Keizer. The Systemwide Assessment is a requirement of the WPCF permit under Schedule B(1). The Systemwide Assessment is included as Appendix C.

Section 4 – Public Outreach

4.1 Regulatory Requirements

The DEQ WPCF Permit Schedule D(5) specifies the requirement for development of a UICMP. Under the requirements of this Schedule, the UICMP must include a description of how the requirements of the Plan will be implemented. The language also states that the permittee must implement a number of elements in the management plan in order to protect groundwater quality. Schedule D(5) c. specifies employee education and public outreach.

Employee education/training is covered in Sections 6, 9, and 10 of this document.

4.2 Existing BMPs and Programs

As was noted in previous sections of the UICMP, the City has implemented 6 + years (2007 to 2013) of the NPDES Phase II permit conditions and has prepared for a permit renewal. Likewise, the City has implemented and renewed their TMDL Implementation Plan. BMPs for those programs were developed and tailored over time to overlap with both programs. While the City has not developed an educational program specifically geared toward UICs and groundwater protection, Keizer has recently added applicable messages to new and existing material. The City provides outreach to the citizens of Keizer using various methods such as public events, annual mailings, the City website, and written material.

Existing BMPs

PE-1 Utilize an Advisory Committee to Develop a Public Education Program
The City will involve a group of stakeholders and volunteers to reach target audiences with key messages.

The BMP was originally developed to fine tune the Phase II educational material, but this BMP can easily be expanded to include groundwater protection.

PE-2 Develop a statistical method to analyze public awareness of stormwater issues
City staff will develop a process to statistically evaluate public awareness of stormwater issues. This activity will be implemented several years after initiating the new public education program listed in PE-1. As was stated above, this BMP can easily be expanded to evaluate UIC outreach efforts.

PE-3 Utilization of the Annual Consumer Confidence Report (CCR) for Drinking Water
The City began using the annual CCR for stormwater related public education starting in 2008. In 2008, a short article was included in the CCR. Since that time a two-sided insert has been utilized. In 2011 and 2012 the City included groundwater messages and/or UIC information. The CCR reaches approximately 11,000 residences in Keizer, including multi-family facilities; far more than a utility bill insert.

PE-4 Annual Website Updates
The City actively began updating the Stormwater section of the website in 2010 with current data and some limited resource material. By 2012, Stormwater Technical personnel had included

substantial educational and resource information on the website. Information is consistently added to the website including annual reports for all stormwater programs. The website includes educational material on UIC devices and the protection of groundwater.

TMDL Mid-Willamette Outreach Group (MWOG)
The City of Keizer is a member of a regional group of agencies dedicated to providing consistent stormwater related messages throughout the Mid-Willamette Valley. The Mid-Willamette Outreach Group (MWOG) includes the City of Salem, the City of Keizer, Marion County, the Marion Soil and Water Conservation District, the City of Albany, and the City of Corvallis. At this time, the primary purpose of this group is to host and facilitate 2 regional events per year.

The Annual Erosion Control Summit is held in January or February. The event was developed to bring the development community, engineers, planners, landscapers, and regional agencies together for erosion control training. The event has evolved into a day of training on sound BMPs as well as new technologies including those associated with low impact development and maintenance. The group hosted approximately 130 participants in January 2013.

Howl-a-Palooza is the second annual event that MWOG sponsors. This event is directed toward bacteria issues and the message is safe and consistent removal of pet waste. MWOG partners with the Marion County Animal Services Department for a license amnesty event. An off-shoot of this is event is the Capital Canine Club (CCC) which is a regional pledge based program for conscientious pet owners and their dogs.

TMDL Public Events and Presentations
The City of Keizer has been flexible and innovative in providing outreach messages when appropriate opportunities arise. Staff participate in an annual Public Services Fair geared toward educating the public about the services that Public Works provide. Keizer utilizes groundwater as its source of drinking water and the Public Services Fair has been a useful tool for helping the public to understand the importance of this resource.

Stormwater staff also provides presentations to the public through neighborhood association meetings, City Council presentations, watershed council meetings, school programs, and other similar community activities. Outreach and educational materials are displayed in brochures, presentations, and a traveling display board.

4.3 New BMPs and Rationale

The Stormwater Division has a robust public education and outreach program. The City will utilize the existing BMPs and add UIC related efforts to ensure that the groundwater protection is included in outreach efforts. Furthermore, the City will add one new BMP devoted toward educating the business community on the importance of groundwater protection and maintenance of privately owned UICs. At present the City has limited information about the location of private UICs. Stormwater staff anticipates that this information will become more apparent when private storm inspection is conducted in accordance with the BMPs referenced in the Revised SWMP, ID-4. This BMP lays out a process to inventory and inspect private stormwater infrastructure located on commercial and residential properties.

New BMPs

PE-U-1 Develop a brochure for commercial, retail, SARA sites, and multi-family property owners or managers that manage stormwater with UICs. Brochures will be sent or hand delivered upon discovery of the UIC.

Specific SARA sites are identified in Appendix C.

4.4 Measureable Goals/Timeline

Table 4.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Public Education in the UICMP.

Table 4.4 BMP Measureable Goals / Timeline

BMP	Measureable Goal	Timeline - Start/Complete
PE-1	1. Organize the advisory committee. 2. Develop materials and schedule. 3. Implement activities to reach target audiences with key messages.	1. 2014 / 2015 2. 2015 / 2016 3. 2015 / 2016 - ongoing
PE-2	Develop statistical method to assess public awareness and implement	2017/2018
PE-3	Track date and content of CCR insert	Annually - Ongoing
PE-4	Track annual updates to the website	Annually - Ongoing
PE	MWOG – events. Track participants and applicable content of each event	Annually - Ongoing
PE	Track public events, participants, and material presented or handed out	Annually - Ongoing
PE-U-1	Track the number of private UICs identified. Add this information to GIS. Provide findings in the annual report.	2014/2015 - Ongoing

Section 5 – Public Involvement

5.1 Regulatory Requirements

The EPA believes that the public can provide valuable input and assistance to a regulated Phase II stormwater management program and therefore, suggests that the public be given opportunities to play an active role in both the development and implementation of the program. Although the UIC program does not have similar public involvement requirements, the City of Keizer values this component of the Phase II program and will apply it to all stormwater programs.

5.2 Existing BMPs and Programs

A Stormwater Advisory Committee (SWAC) was organized in 2008 as a condition of the SWMP addressing the Public Involvement minimum control measure. The purpose of the advisory committee was to assist staff with development of stormwater ordinances in conjunction with the minimum control measures listed in the SWMP. Stormwater staff identified the value of this group early in the meeting process. The SWAC has become an official City of Keizer committee and review all stormwater programs, and the associated recommendations by staff. The SWAC is also used to address funding issues associated with the City's stormwater programs.

The committee is composed of 9 members when all positions are filled. Currently the committee participants include the following:

The City's Mayor
2 City Council Members (appointed by the Mayor)
1 City of Salem Representative
1 Marion County Representative
1 Member of the Building/Development Community
1 Business Representative
2 Citizens at Large

The SWMP also includes a storm drain marking activity under the public involvement minimum control measure. Community groups have been utilized to implement this BMP. A blue aluminum medallion was chosen for MS4 catchbasins. In order to quickly identify UIC structures in the community, Public Works personnel have marked all UIC catchbasins with a red medallion. See Figure 5.2

Figure 5.2 – UIC Catchbasin Marker

Using Public Works staff to mark UIC catchbasins would not generally be considered a public involvement activity, but installing new markers will be added to the Illicit Discharge and Spill Prevention and Response measures listed in Section 6.

Existing BMPs and activities that can or do apply to groundwater protection:

PI-2 Utilize the Advisory Committee for Annual Program Review. This BMP as written includes an annual review of the SWMP and TMDL Implementation Plan by the SWAC. Review of the UICMP will be included. The BMP was developed in order to address adaptive management.

5.3 New BMPS and Rationale

In order to ensure that UIC management and operation is being closely followed by the advisory committee, a minimum of 2 SWAC meetings per year will be devoted solely to UIC related issues outside of the annual review.

New BMPs

PI-U-1 The SWAC will devote at least 2 of their annual meetings solely to UIC issues.

5.4 Measureable Goals/Timeline

Table 5.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Public Education in the UICMP.

Table 5.4
BMP Measureable Goals / Timeline

BMP	Measureable Goal	Timeline - Start/Complete
PI-2	Document UICMP review and any adaptive management recommendations in the annual report	Annual / Ongoing
PI-U-1	Document meeting topics and any actions taken in the annual report	Annual / Ongoing

Section 6 – Illicit Discharge Detection and Elimination Spill Prevention and Response

6.1 Regulatory Requirements

Schedule D(5) specifies that the permittee must submit a UICMP to DEQ for approval. The permittee must implement the plan after DEQ has approved it. The management plan must include a description of how certain elements will be implemented in order to protect groundwater quality. Item e. states that injection systems must be protected from *accidental spills or illicit disposal of wastes or contaminants.* Item f. states that the permittee must prevent *injection of stormwater from loading docks, refueling areas, areas of hazardous and toxic material storage or handling, materials storage or handling areas, or other discharges that may contain pollutants above levels of concern.*

6.2 Existing BMPs and Programs

The City of Keizer adopted Stormwater Discharge Ordinance #2009-585 in March 2009. While the ordinance was a BMP listed in the SWMP, staff included language that would provide equal protection to UICs. The applicable language is included below.

<u>Section 9 Prohibition of Illegal Discharges</u> – *No person shall discharge or cause to be discharged into the municipal storm drain system, **UICs**, or waterways any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation in applicable water quality standards.*

<u>Section 11 Waste Disposal Prohibitions</u> – *No person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, left, or maintained, in or upon any public or private property, driveway, parking area, street, alley, sidewalk, component of the storm drain system, **UICs**, or Waters of the State, any refuse, rubbish, garbage, litter, or other discarded or abandoned objects articles, and accumulations, so that the same may cause of contribute to pollutions.*

<u>Section 19 Requirement to Eliminate or Secure Approval for Illicit Connections</u> – *The Public works Director may require by written notice that the person responsible for an illicit connection to the storm drain system comply with the requirements of this Ordinance to either eliminate the connection or secure approval for the connection by a specified date, regardless of whether or not the connection or discharges to it had been established or approved prior to the effective date of this Ordinance.*

In addition to the Stormwater Discharge Ordinance, the City developed an internal operation plan for illicit discharges in 2008. The IDDE Plan provides operational measures for personnel who respond to illegal dumping, spills, and illicit discharges. The plan also includes a process for conducting annual outfall inspections. Because the plan was written in 2008 it needs to be revised to reflect current conditions and goals.

The City of Keizer initiated a TV inspection program for the storm system in 2011. Approximately 70% of the City's UICs have been TVd and about 6% of the City's MS4. This activity is a BMP listed in the Operations and Maintenance Section of the Revised SWMP. The program has validity in a number of ways. The work is being conducted in order to verify the

City's asset inventory, and identify high priority repair needs. DEQ also approved this BMP as an effective tool to identify illegal connections and illicit discharges. The measureable goal for the BMP is to TV 10% of the storm system annually.

Existing BMPs:

ID-1 Revise the IDDE Plan. The plan needs to be updated to address current conditions and activities. The IDDE Plan does not address UICs as written, but that content will be added to the revised document. Internal training is to be included as part of the revision process. In addition, maintenance personnel will be involved in the revision process in order to allow staff to fully understand the specifics of the plan and activities.

ID-2 Develop Criteria for High Risk Areas. The goal of the BMP was to identify high risk areas that are prone to illegal stormwater activity. Developing the criteria and identifying areas will allow for a more efficient inspection process.

ID-3 Map Potential High Risk Areas in GIS High risk areas will be added to the GIS system using the information obtained in BMP ID-2.

6.3 New BMPs and Rationale

No new BMPs are being proposed for the IDDE minimum control measure. An updated IDDE Plan, training for maintenance personnel, and the TV inspection program provide significant coverage for the prohibited activity addressed in this minimum control measure. Groundwater protection will be emphasized in the new IDDE plan and training will include UIC identification, location, and operation strategies.

The Spill Prevention and Response Plan attached as Appendix E and the discussion in Subsection 6.5 provide additional measures for addressing spills, dumping, and illegal connections.

6.4 Measureable Goals and Timeline

Table 6.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Illicit Discharge Detection and Elimination in the UICMP.

Table 6.4
BMP Measureable Goals / Timeline

BMP	Measureable Goal	Timeline - Start/Complete
ID-1	Complete the Revised IDDE plan. Conduct employee training for the new document and include follow-up in annual report.	Start 2014 – Finish 2015
ID-2	Develop high risk criteria and provide findings in the annual report.	Start 2014 – Finish 2014
ID-3	Add high risk areas to GIS and update new information annually	Start 2015 - ongoing

6.5 Spill Prevention and Response Overview

The City of Keizer Public Works Department has approximately 20 staff members who have the ability to respond to spills or illegal dumping within the community. For the most part, these individuals are part of the maintenance staff which perform duties assigned to the various sections of the Department. Prior to 2008 when the City acquired a VacCon truck, staff requested assistance from outside agencies for many stormwater or wastewater related events that posed a risk to the public or the environment. The acquisition of that piece of equipment broadened the City's response capabilities, however the City was not able to take on the lead role in many emergency activities until 2011 when the asset inventory was more fully developed. Currently Keizer has field inspected all UICs and responds to emergency spills and reports of dumping. The City maintains a water quality log which is included in the NPDES annual report.

The NPDES Permit requires that the City report if any other entity is implementing any portion of the minimum control measures listed in the NPDES SWMP. The City has reported that they are solely responsible for implementing all measures in the program.

The City of Salem maintains the sanitary sewer in Keizer. The Keizer Fire Department is not part of the City of Keizer agency. Marion County Fire also responds to emergencies within the City of Keizer.

6.6 New BMPs and Rationale

The City currently has a draft Spill Prevention and Response Plan (SPRP) and a draft Spill Response Manual for Public Works employees. In addition to completing those documents, Public Works staff will need to coordinate with outside agencies in order to make certain the UICs are protected in the event of a large spill that would require response from outside agencies such as the City of Salem, Keizer Fire, or Marion County Fire. The City is proposing 3 new BMPs to complete the spill prevention and response components associated with the WPCF permit.

New BMPs

SP-U-1 Complete the draft Spill Response Manual. The manual is currently in draft form. Review and input is required from Public Works maintenance personnel.

SP-U-2 Conduct annual training for employees who respond to spills that involve UICs. Training will include a recordkeeping and reporting component.

SP-U-3 Complete the SPRP. This is the guiding document for spill response in the City of Keizer.

SP-U-4 Coordinate with emergency response agencies for activities which involve UICs. Coordination efforts will include a method to identify UICs in the field, regulatory measures which includes a means to protect injection systems during emergency fire-fighting activities, and the wash down of spills.

SP-U-5 Install catchbasin markers on newly installed UICs The red medallion shown in Figure 5.2 will be installed for all new publicly owned UICs.

6.7 Measureable Goals/Timeline

Table 6.7 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Spill Prevention and Response in the UICMP.

Table 6.7
BMP Measureable Goals / Timeline

BMP	Measureable Goal	Timeline - Start/Complete
SP-U-1	Complete the Spill Response Manual. Document completion in annual report.	2013/2014
SP-U-2	Conduct annual training for employees. Document training activities in annual report	2014 - annually
SP-U-3	Complete the Spill Prevention and Response Plan (SPRP) Document in the annual report.	2013/2014
SP-U-4	Document meetings and outcome in annual report.	2014/2015
SP-U-5	Track number of new markers installed annually	2014 - annually

6.8 Spill Prevention and Response Plan

The SPRP is the guiding document for the City of Keizer emergency spill prevention and response activities. The plan is intended to apply to the City's UIC devices as well as the MS4. The primary goals of the SPRP are to:

1. Implement spill prevention and response practices related to UICs and the MS4 that manage flows from public rights-of-way and City owned property
2. Implement emergency preparedness, prevention, mitigation and response activities
3. Identify the roles and responsibilities assigned to City staff for spill/emergency prevention and response
4. Coordinate with response support agencies in order to provide protection to UICs and the MS4 and in turn, protection of groundwater and surface water
5. Ensure that regulatory reporting and data collection are accurate and comprehensive.

6.9 Spill Response Manual

The City of Keizer Spill Response Manual will describe the policies, plans, and procedures the organization has in place to deal with hazardous spills as they relate to the protection of groundwater and surface water. The manual is being developed to provide field personnel guidance on how to prevent and respond to spills which could impact Keizer's stormwater system including UICs and the MS4.

The manual will focus on prevention, response, proper material disposal, and reporting. The document also calls for the organization of a Spill Action Team. This group is available to provide instructions to responders and will be the individuals responsible for any regulatory

reporting. The Spill Action Team will take the lead in working with response support agencies and conducting annual training for all Public Works field personnel.

Section 7 – Construction Site Stormwater Management

7.1 Regulatory Requirement

Schedule D(5) of the WPCF permit specifies that the permittee must submit a UICMP to DEQ for approval. The permittee must implement the plan after DEQ has approved it. The management plan must include a description of how certain elements will be implemented in order to protect groundwater quality. Item f. states that *the permittee must prevent injection of stormwater from loading docks, refueling areas, areas of hazardous and toxic material storage or handling, material storage or handling areas, or other discharges that may contain pollutants above levels of concern.*

7.2 Existing BMPs and Programs

The City of Keizer adopted an Erosion Control ordinance in May 2011. Development of this ordinance was a BMP in the first SWMP which addresses construction site runoff. Protection for UICs was included in the ordinance language as follows:

Section 3 Definitions - Stormwater System. All natural and human-made facilities that regulate the direction, quantity and quality of surface or groundwater, including drainage easements, culverts, storm drains, catch basins, **underground injection control systems**, stream corridors, rivers, ponds, ditches, swales, intermittent waterways, or wetlands and impoundments.

Section 10 Prohibited Activities (a) No person shall cause or suffer visible and measurable erosion or pollutants to leave the project site, or to otherwise drag, drop, track, or otherwise place or deposit, or permit to be deposited any pollution from the site upon a public or private street or into any part of the stormwater system, or any part of a private storm drainage and surface water system which drains or connects to the public storm drainage and surface water system, or bury on any portion of the construction site. (b) No person shall wash or flush any pollutant-layden water into any part of the stormwater system.

The City of Keizer currently conducts erosion control plan review and site inspections. Inspectors have erosion prevention sediment control (EPSC) training and certification.

Existing BMPs

CS-1 Conduct EPSC Training for Applicable City Staff This BMP includes annual refresher training. The BMP specifies that City inspectors will obtain specialized training during the permit term. Certified Erosion and Sediment Control Lead (CESCL) should be the standard for primary inspectors and inspectors of any 1200-C sites.

CS-3 Revise the Construction Site Pollution Prevention Plan (CSPPP) and Ordinance This BMP was developed to allow staff to streamline the program if possible and include additional regulations in the ordinance if warranted. The original BMP as written included a specification that the City would require flow reduction elements for new development. The CSPPP and ordinance will be revised, but flow reduction specifications will be proposed for inclusion in the City's Design Standards which are scheduled for revision. (See Section 8)

CS-4 Establish Hotline to Receive Complaints from the Public The City currently has an after-hours phone system that will route callers to a Public Works employee assigned to stormwater/streets issues. Along with the City's business hours system, citizens with inquiries or emergencies can receive a response 24 hours a day, 7 days a week. No formal process has been developed for documentation of calls or follow-up activities. Implementation of this BMP calls for a separate hotline and the development of a call log.

7.3 New BMPs and Rationale

With a suite of robust existing BMPs for this control measure, the City is only proposing one new BMP in this category.

Stormwater personnel developed erosion control field inspection standard operating procedures (SOP) in 2013. The purpose of the procedures, and associated enforcement measures, were to ensure all City inspectors were providing the same level of service to the development community. Furthermore, the Public Works Department seeks to provide consistent enforcement measures. In addition, a database has been developed that captures field inspection activities for all regulated development sites.

The SOPs and their purpose, as described above, did not include inspection of permitted UICs being installed on the project site. Routine inspection during site visits will ensure that groundwater is protected during construction and that the system is designed in accordance with City standards.

New BMPs

CS-U-1 Add Inspection of UICs to the City's Erosion Control Field Inspection SOP

Public Works personnel will review and approve the revised SOPs. Completion of this task will be noted in the annual report. Inspection database will be routinely updated.

7.4 Measureable Goals and Timeline

Table 7.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Construction Site Runoff in the UICMP.

Table 7.4
BMP Measureable Goals / Timeline

BMP	Measureable Goal	Timeline - Start/Complete
CS-1	Conduct annual refresher training Obtain specialized training for inspectors	Annually 2014 / 2015
CS-3	Revise CSPPP and Erosion Control Ordinance	2014 / 2015
CS-4	Report completion in annual report and maintain a log of incoming calls	2015 / 2016
CS-U-1	Revise erosion control SOPs and update database	2014 / 2015 - Ongoing

Section 8 – Post Construction Stormwater Management in New and Redevelopment

8.1 Regulatory Requirements

According to the EPA, Phase II MS4s are required to develop measures to address post construction runoff in new and redevelopment. Minimum control measure #5 looks toward the development of strategies to reduce the impact of runoff from new and redevelopment.

Implementation of this measure will help to meet the City's goals for the UICMP discussed in Section 1 of this document. Post Construction activities help support the natural hydrogeologic cycle, reduce direct discharge to waterways, and restore normal stream flow.

8.2 Existing BMPs and Programs

The NPDES Phase II Post Construction Stormwater Management minimum control measure directs permittees to mitigate stormwater impacts from new development by utilizing practices to treat, store, and infiltrate runoff onsite before it can affect local waterways. Site designs that reduce impervious surfaces and utilize low impact development practices are useful ways to achieve the goal of reducing flow and improving water quality.

During the first NPDES permit period, Keizer was required to develop an ordinance, conduct plan review and enforcement, and provide employee training for Post Construction Stormwater Management in New and Redevelopment. The existing Design Standards were adopted by ordinance. The Design Standards reference King County, Washington and the City of Portland Bureau of Environmental Services for design alternatives to meet the goal of this minimum control measure.

Keizer is currently requiring low impact development features for all new commercial development. Staff conducts plan review and inspections are performed through the erosion control program.

Keizer developed 3 new BMPs in the Revised SWMP. The most critical of the 3 is the revision of City Design Standards and Development Code.

<u>Existing BMPs</u>

<u>DS-1 Revise Design Standards and Development Code to include capture and treatment for new and re-development. Formally adopt revisions.</u> The BMP as written in the SWMP needs to have a slight revision approved by DEQ prior to the submittal of the new NPDES permit. This measure states that the new standards will require capture and treatment of 80% of stormwater in new and re-development. The BMP needs to establish the project scale for this requirement and a mitigation process needs to be developed for sites that do not have sufficient infiltration rates.

In regard to UICs, the revisions noted above will include language regarding the process for adding new UICs to the City's existing inventory.

DS-2 Implement the revised standards and conduct plan reviews, inspections, and enforcement activities

DS-3 Conduct training for implementation of revised water quality development standards

8.3 New BMPs and Rationale

No new BMPs are being proposed for this minimum control measure other than including UIC related standards to the Design and Development Code revisions. In addition, the City will implement BMPs DS-2 and DS-3 with UIC elements as is related to the BMP.

8.4 Measureable Goals and Timeline

Table 8.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Post Construction Stormwater Management in New and Redevelopment in the UICMP.

Table 8.4
BMP Measureable Goals/Timeline

BMP	Measureable Goal	Timeline - Start/Complete
DS-1	Adopt new standards by 2016. Report activities in annual report	2014 / 2016
DS-2	Implement new standards and track program elements including enforcement activities	2016 - ongoing
DS-3	Train employees when standards are completed and in subsequent years as needed	2016 - ongoing

Section 9 – Operations and Maintenance

9.1 Regulatory Requirements

The DEQ WPCF Permit Schedule D(5) specifies the requirement for development of a UICMP. Under the requirements of this Schedule, the UICMP must include a description of how the requirements of the Plan will be implemented. The language also states that the permittee must implement a number of elements in the management plan in order to protect groundwater quality. Schedule D(5) d. calls out operations and maintenance.

9.2 Existing BMPs and Programs

Minimum control measure #6 in the NPDES Phase II program combines operations and maintenance (O & M) and good housekeeping in municipal operations under the single measure. For the purpose of this document, O & M and good housekeeping are addressed in separate sections. (See Section 10 for good housekeeping measures and BMPs).

The City has 3 BMPs listed in the Revised SWMP that currently can be applied to the management and operation of UICs. BMP OM-2 was developed to fine tune the City's stormwater asset inventory, identify illegal connections, and identify illicit discharges. The TV inspection process was also used to conduct initial inspection of most of the City's UICs in 2011. There are 13 UICs that have not been inspected using this process.

The initial catchbasin cleaning program called for cleaning a set percentage of the City's catchbasins; 25% during the first NPDES permit term. The BMP has been changed to a program that calls for inspection of all catchbasins annually. Those UIC and MS4 structures with 6" or more of debris will be cleaned. Records are retained for any structures that need repair which is completed in the annual cycle.

Existing BMPs

OM-2 Annually inspect 10% of the City's publically owned infrastructure covered by the NPDES Permit TV inspection. (Work to be contracted) The purpose of this BMP is to identify illegal connections and discharges. The BMP will also allow staff to fine tune the existing asset inventory in GIS.

OM-4 Catchbasin cleaning – implement a rotation program to include annual inspection, cleaning, and repair for catchbasins. This activity will allow staff to identify problematic areas of town and establish additional outreach or inspection as needed.

OM-5 Implement street sweeping program. This BMP includes changing the contract language to require environmental practices that protect groundwater and surface water quality.

9.3 New BMPs and Rationale

The WPCF permit calls out the requirement for operations and maintenance practices pertaining to UICs with the goal of protecting groundwater. A draft Operations and Maintenance Manual for UICs has been completed. Stormwater staff will include maintenance personnel in the review of the document to address any outstanding issues or practices. Once complete the manual will be implemented. Employee training is scheduled to occur annually.

The new BMPs coupled with the existing Revised SWMP BMPs provide a solid base for long term operation of UICs.

New BMPs

OM-U-1 Complete the UIC Operations and Maintenance Manual for UICs The UIC O & M Manual is in draft stage. Maintenance personnel will provide input and review the document.

OM-U-2 Implement the Operations and Maintenance Manual When the Manual is completed, it will be implemented.

OM-U-3 Conduct Employee Training Annual employee training will be conducted for City of Keizer maintenance personnel.

9.4 Measureable Goals and Timeline

Table 9.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Operations and Maintenance in the UICMP.

Table 9.4
BMP Measureable Goals/Timeline

BMP	Measureable Goal	Timeline – Start/Complete
OM-2	Provide footage of pipe inspected and findings in the annual report	Annual - ongoing
OM-4	Follow inspection, clean, repair protocol. Report trends in the annual report.	Annual - ongoing
OM-5	Annually report debris totals	Annual - ongoing
OM-U-1	Complete the O & M Manual for field personnel. Utilize field personnel for final review	2014 / 2015
OM-U-2	Implement the O & M Manual as designed.	2015 - ongoing
OM-U-3	Provide annual training. Document efforts in the annual report	2015 - ongoing

9.5 Operations and Maintenance Plan Overview

The City's draft O & M plan provides an overview of the system, and general regulatory background. The City has included a structure maintenance and scheduling section as well as a maintenance schedule. The O & M plan also includes BMPs for repair and replacement.

Section 10 – Good Housekeeping

10.1 Regulatory Requirements

Schedule D of the WPCF permit discusses UICMP requirements. Section 5 species that the permittee must implement the management plan and any updates that are approved by DEQ. The language also states that the permittee must implement a number of elements in the management plan in order to protect groundwater quality. Schedule D(5) g. *requires the City to implement housekeeping practices to protect groundwater quality, and c. requires employee education.*

10.2 Existing BMPs and Programs

Operations and Maintenance, and Pollution Prevention in Municipal Operations (Good Housekeeping) are rolled into one minimum control measure for NPDES Phase II permittees. As was discussed in Section 9, these measures have been broken out into two activities for the purpose of the UICMP.

During the first permit term, the City of Keizer developed a Good Housekeeping Manual as was required in the NPDES permit. The existing Good Housekeeping Manual does not include UIC related information or BMPs. However, the format of the manual lends itself to adding additional information geared specifically toward UIC management practices and good housekeeping activities.

10.3 New BMPs and Rationale

New BMPs

GH-U-1 Revised the existing Good Housekeeping Manual to include UIC related information and BMPs Revision of the manual is specified in the Revised SWMP as BMP OM-1. Staff has added the revision in as a new BMP for the UICMP. Field staff will be included in the revision process.

GH-U-2 Conduct Employee Training Annual training will occur for use of the manual as well as inspection and recordkeeping activities.

10.4 Measureable Goals and Timeline

Table 10.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Good Housekeeping in the UICMP.

Table 10.4
BMP Measureable Goals/Timeline

BMP	Measureable Goal	Timeline - Start/Complete
GH-U-1	Involve maintenance personnel in document revisions. Document changes in the annual report	2013 / 2014
GH-U-2	Utilize maintenance personnel to provide training for Public Works employees. Document training in the annual report.	2014 / Ongoing

10.5 Good Housekeeping Manual

The existing Good Housekeeping Manual was developed in a booklet like format for easy use in the field. The introduction includes regulatory information as well as the environmental implications of poor housekeeping activities.

The manual was designed by activity. The user can look up what he or she intends to do for the day. Each activity has a suite of BMPs for personnel to consider and implement if appropriate. For the purpose of incorporating UIC good housekeeping practices, staff intends to evaluate the activities in the existing manual and add the appropriate BMPs.

Section 11 – Recordkeeping

11.1 Regulatory Requirements

Schedule F(3) d of the WPCF permit states that the City must retain records of all monitoring and maintenance information, including field notes, calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, all analyses of the data generated, all reports required by the permit, and records of all data used to complete the application for the permit. The City must keep this information for a period of at least 10 years from the date of sample, measurement, report, or application.

11.2 Existing BMPs and Programs

The City of Keizer began formally maintaining records for stormwater related activities and actions when the first NPDES permit was issued.

The City currently uses the GIS system for most of the stormwater asset management. Stormwater staff has also recently redesigned the filing system for the Public Works Stormwater Division computer drive which has resulted in a more efficient way to store and retrieve information.

Existing BMPs

RR-1 Develop an electronic stormwater database to track SWMP program elements including repair and maintenance activity. This BMP was developed to provide a comprehensive data management program for the maintenance of stormwater data.

11.3 New BMPs and Rationale

While BMP RR-1 does not specifically address tracking and storage of the materials required in the WPCF permit, the City considers 'stormwater', in this case as being all inclusive of stormwater programs and activities in the City of Keizer.

As is covered in Section 2, the SWMP records and activities are provided to DEQ in the annual report. New BMPs included with this document will be included in the WPCF annual report.

11.4 Measureable Goals and Timeline

Table 11.4 includes the BMP identifier, measureable goal, and timeline for implementation of the activities that address Public Education in the UICMP.

Table 11.4
BMP Measureable Goals/Timeline

BMP	Measureable Goal	Timeline - Start/Complete
RR-1	Develop the electronic stormwater database framework. Update information annually	2014 / 2015 - ongoing

Section 12 - Monitoring

12.1 Regulatory Requirements

A Monitoring Plan is required under Schedule B of the WPCF permit. Under Schedule B(2) of the permit, the City must implement the DEQ approved monitoring plan within 180 days of the issuance of the WPCF permit, and comply with the plan requirements. The City must submit any proposed revisions to the plan to DEQ and have the changes approved before implementation.

12.2 Existing Conditions / Background

The City of Keizer was not required to do stormwater sampling under the conditions of the first NPDES permit. There has been no formal sampling program for stormwater prior to the approval of the Monitoring Plan required as part of the WPCF permit. Keizer has conducted intermittent stormwater related sampling for isolated incidents and in preparation for the development of the WPCF permit and monitoring plan.

In March 2013, Keizer conducted a large sampling of UICs for Table 1 Pollutants listed in the latest draft WPCF Permit Template. The goal was to characterize stormwater for those UICs which were the most proximate to water wells. Samples were taken at 18 UICs, located within 37-185 feet of a water well (according to ArcGIS records). The Table 1 pollutants sampled, and associated Method Reporting Limits and Action Levels were as follows:

Pollutant Sampled	*MRL*	*Action Levels*	*Highest Detected Level*
Benzo(a)pyrene	0.1 µg/L	2 µg/L	No Detections
Di(2-ethylhexyl)phthalate	1.0 µg/L	300 µg/L	5.16 µg/L
Pentachlorophenol	0.2 µg/L	10 µg/L	0.37 µg/L
Copper	0.5 µg/L	1300 µg/L	15.8 µg/L
Lead	0.1 µg/L	500 µg/L	18.3 µg/L
Zinc	1.0 µg/L	50,000 µg/L	695 µg/L

The results were that for all of the 18 UIC sample sites, readings for all pollutants were well below Action Levels. The highest pollutant readings were less than 4% of Action Levels, and most were less than 2%. There were no detects at all for Benzo(a)pyrene.

In regard to UIC sampling, the City has been involved in the collaborative sampling program with other Association of Clean Water Agencies (ACWA) since 2003. The City conducted sampling at UIC # 21 for 2 events per year. Annual reporting has been conducted for this effort and those findings submitted to DEQ.

12.3 Overview of Monitoring Plan

The City of Keizer monitoring plan was developed to represent the Keizer UIC system in its

entirety. The City's plan focuses on monitoring in areas where there is highest risk both in relation to pollutant loading and physical location to groundwater or to water wells.

The City of Keizer UIC Monitoring Plan is attached as Exhibit A.

ATTACHMENTS, APPENDICES, AND EXHIBITS

UIC Implementation Matrix

Appendix A – Revised SWMP
Appendix B – TMDL Implementation Plan Matrix
Appendix C – Systemwide Assessment
Appendix D – Decommissioning Plan

Exhibit A – Stormwater Monitoring Plan

UICMP Implementation Matrix

ID	BMP Description	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Public Education and Outreach (PE)						**5th Year**					
PE-1	Utilize an Advisory Committee to Develop a Public Education Program.	Organize Committee	Develop Materials Implement Activities								
PE-2	Statistically Evaluate Public Awareness of Stormwater Issues.				Statistical Activity						
PE-3	Utilize the Annual Consumer Confidence Report for Drinking Water.	Annual Ongoing									
PE-4	Update the Website Annually.	Annual Ongoing									
PE	MWOG -events. Track participants and applicable content of each event.	Annual Ongoing									
PE	Track public events, participants, and material presented or handed out.	Annual Ongoing									
PE-U-1	Develop a brochure for commercial, retail, and multi-family property owners or managers that manage stormwater with UICs. Brochures will be sent or hand delivered upon discovery of the UIC.	Annual Ongoing									
Public Involvement (PI)											
PI-2	Utilize the Advisory Committee for Annual Program Review.	Annual Ongoing									
PI-U-1	The SWAC will devote at least 2 of their annual meetings solely to UIC issues.	Annual Ongoing									
Illicit Discharge Detection and Elimination (ID)/Spill Prevention (SP)											
ID-1	Revise the IDDE plan.	Revise Plan									
ID-2	Develop Criteria for High Risk Areas.	Develop Criteria									
ID-3	Map Potential High Risk Areas in GIS.		Link to GIS	Update Annually							
SP-U-1	Complete the Spill Response Manual.	Complete Manual/2014									
SP-U-2	Conduct annual training for employees who respond to spills that involve UICs.	Training 2014	Ongoing								
SP-U-3	Complete the Spill Prevention and Response Plan (SPRP).	Complete SPRP / 2014									
SP-U-4	Coordinate with emergency response agencies for activities which involve UICs.	Start Coordination	End Coordination								

UICMP Implementation Matrix

BMP	BMP Description	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Construction Site Runoff (CS)						**5th Year**					
CS-1	Conduct EPSC Training for Applicable Staff	Training	Annual Ongoing								
CS-3	Revise the Construction Site Pollution Prevention Plan (CSPPP) and Ordinance.	Revise CSPPP and Ordinance									
CS-4	Establish Hotline to Receive Complaints from the Public.		Establish Hotline								
CS-U-1	Add Inspection of UICs to the City's Erosion Control Field Inspection SOP.	Edit SOP	Ongoing								
Post Construction / Development Standards (DS)											
DS-1	Revise Design Standards and Development Code to include capture and treatment for new and re-development.	Initiate Project	Complete Project								
DS-2	Implement the revised standards and conduct plan reviews, inspections, and enforcement activities.			Implement New Process							
DS-3	Conduct training for implementation of revised water quality development standards.			Training							
Pollution Prevention in Operations and Maintenance (OM)											
OM-2	Annually inspect 10% of the City's publically owned infrastructure covered by the NPDES Permit.	Annual Ongoing									
OM-4	Catchbasin cleaning -implement a rotation program to include annual inspection, cleaning, and repair for catchbasins.	Annual Ongoing									
OM-5	Implement street sweeping program.	Annual Ongoing									
OM-U-1	Complete the UIC Operations and Maintenance Manual for UICs.	Complete Manual									
OM-U-2	Implement the O & M Manual as designed.		Implement BMPS 2015								
OM-U-3	Conduct Employee Training.		Training 2015								

UICMP Implementation Matrix

ID	BMP Description	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Good Housekeeping (GH)						**5th Year**					
GH-U-1	Revised the existing Good Housekeeping Manual to include UIC related information and BMPs.	Revise Manual 2014									
GH-U-2	Conduct Employee Training.	Implement Activities	Annual Ongoing →	→	→	→	→	→	→	→	→
Recordkeeping (RR)											
RR-1	Develop the electronic storm water database framework to track SWMP program elements including repair and maintenance activity.	Develop Database	Routinely Update →	→	→	→	→	→	→	→	→

DRAFT REVISED SWMP

National Pollutant Discharge Elimination System
Municipal Separate Storm Sewer System (NPDES MS4)
Phase II Stormwater Management Plan

City of Keizer, OR

P.O. Box 21000
Keizer, OR 97307

August, 2011

Prepared By:

City of Keizer
Public Work Department
Stormwater Division

City of Keizer, Oregon

Stormwater Management Plan (SWMP)
National Pollutant Discharge Elimination System
Individual Permit Application – Second Permit Period

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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Appendix A - Benchmark Calculation

Appendix B – Revised SWMP Implementation Schedule

Table 1
Acronyms and Abbreviations

1200-C	**DEQ Erosion Control permit for construction Activities**
ACWA	**Oregon Association of Clean Water Agencies**
BA	**Budget Analysis**
BMP	**Best Management Practice**
CFR	**Code of Federal Regulations**
City	**City of Keizer**
CS	**Construction Site Standards**
CSPPP	**Construction Site Pollution Prevention Plan**
CWA	**Clean Water Act**
DEQ	**Oregon Department of environmental Quality**
EPA	**United States Environmental Protection Agency**
ERP	**Enforcement Response Plan**
ESA	**Endangered Species Act**
ESU	**Equivalent Service Unit**
FTE	**Full Time Equivalent**
GIS	**Geographic Information System**
IDDE	**Illicit Discharge Detection and Elimination**
MEP	**Maximum Extent Practicable**
MOU	**Memorandum of Understanding**
MS4	**Municipal Separate Storm Sewer System**
NPDES	**National Pollutant Discharge Elimination System**
O & M	**Operations and Maintenance**
OAR	**Oregon Administrative Rules**
ODFW	**Oregon Department of Fish and Wildlife**
OWEB	**Oregon Watershed Enhancement Board**
PE	**Public Education**
PI	**Public Involvement**
PLR	**Pollutant Load Reduction**
PY	**Permit Year**
RR	**Record Keeping and Reporting**
SDWA	**Safe Drinking Water Act**
SWAC	**Stormwater Advisory Committee**
SWMP	**Stormwater Management Plan / Program**
TMDL	**Total Maximum Daily Load**
UGB	**Urban Growth Boundary**
UIC	**Underground Injection Control**
WPCF	**Water Pollution Facilities Permit**

Revised Stormwater Management Plan
Second Permit Term

Section 1 Background / Introduction

1. 1 Background

In 1987 the federal Clean Water Act (CWA) was amended to include the requirement that stormwater be regulated as a point source discharge under the National Pollutant Discharge Elimination System (NPDES). The NPDES program was implemented in two phases. Phase I regulations were adopted in 1990 requiring medium to large Municipal Separate Storm Sewer Systems (MS4s) with populations of 100,000 or more to obtain permit coverage for their stormwater discharges. Phase II regulations were adopted in 1999 which required small MS4s to obtain coverage under the NPDES program. In Oregon the Environmental Protection Agency (EPA) has delegated authority to the Oregon Department of Environmental Quality (DEQ) for administering and enforcing Phase I and Phase II permits. DEQ used federal guidelines to identify the jurisdictions that would be regulated as small MS4s under the Phase II NPDES program. The City of Keizer was identified as one of these jurisdictions, because it is located within the Salem/Keizer urban area. The City of Salem, a Phase I community, and the City of Keizer share an Urban Growth Boundary (UGB) at the southernmost boundary of the City.

The NPDES Phase II stormwater regulations described in the Code of Federal Regulations (CFR) under 40 CFR, Part 122.26, describe the process for municipalities to apply for MS4 permits. Among other things, the MS4 permit application requires the development of a Stormwater Management Plan (SWMP) that addresses six minimum control measures. When implemented throughout the permit period these measures are expected to result in reductions of pollutants discharged into receiving waters. The six minimum control measures are listed as follows:

#1 Public Education and Outreach
#2 Public Involvement / Participation
#3 Illicit Discharge Detection and Elimination
#4 Construction Site Runoff Control
#5 Post-Construction Stormwater Runoff Control
#6 Pollution Prevention/Good Housekeeping

The SWMP lists the Best Management Practices (BMPs) for each minimum control measure, the rationale for how and why the BMPs were selected, the parties responsible for implementation, the established measurable goals for each BMP, and the timeline for execution.

1.2 Introduction

The City of Keizer established a citizen's Stormwater Task Force to assist in developing the initial stormwater management program for the first permit term in order to meet the NPDES Phase II requirements. The final SWMP was prepared by URS Company of Portland, OR. DEQ issued NPDES permit #102904 to the City of Keizer in March 2007. According to the permit "*The permittee must fully implement its SWMP, as defined by the measurable goals established by the permittee's SWMP, by February 28, 2012.*"

In 2008, the City organized a modified Stormwater Task Force, the Stormwater Advisory Committee (SWAC), to review program specifics and assist with the development of required ordinances. The SWAC includes: the Mayor, 2 City Council members, 2 citizens at large, 1 City of Salem representative, 1 Marion County representative, and 2 members of the building/development community. The committee has been instrumental in moving the program forward throughout the first permit term.

The SWAC has reviewed and provided comment on the revised SWMP for the second permit term. The City will continue to utilize the group for program development and evaluation.

1.3 Permit Renewal Package

The permit renewal package requires that the applicant provide an evaluation of the current permit period. That information is located in *Stormwater Management Plan Evaluation – NPDES Permit #102904* which is being submitted as a separate document with the permit renewal package. The *Stormwater Management Plan Evaluation* includes a discussion of 1) Evaluation of SWMP BMPs, 2) Proposed BMP Modifications, 3) Non-stormwater Discharges, and 4) Adaptive Management. A Total Maximum Daily Load (TMDL) Benchmark Analysis is included as Appendix A in this document.

Section 2 Description of the Permit Area

2. 1 City Description

The City of Keizer incorporated in 1982. The current population is 36,295. The City is approximately 7.5 square miles in size and is nearly completely built-out to the Urban Growth Boundary (UGB). Future annexation is likely to occur northeast of the existing UGB. Keizer is located in Marion County and shares a southern boundary with the City of Salem. The Willamette River is located on the southwest boundary of the City with Marion County to the east and north. I-5 is located on the eastern boundary. Polk County lies to the west of the Willamette River.

Keizer is primarily a residential community. There is a commercial core along River Rd which transects the City north/south, and a large commercial center that abuts I-5, Keizer Station. The City manages stormwater through operation of the MS4 and the use of underground injection control (UIC) devices.

2.2 Waterways

As noted above, the Willamette River flows along the southwest boundary of the City of Keizer. Claggett Creek enters the City from Marion County and the City of Salem to the south and travels northwest through much of the City. Claggett Creek discharges to Clear Lake which lies outside of the western boundary of the City. Clear Lake discharges to the Willamette River. Clear Lake is an oxbow lake created by the Willamette River. Labish Ditch enters the City of Keizer from Marion County to the east. It travels west and then southwest. The confluence of Claggett Creek and Labish Ditch are adjacent to the McNary Golf Course located inside the Keizer UGB. There are several unnamed intermittent waterways that flow into or through the City.

The Oregon Department of Environmental Quality (DEQ) issued the Willamette Basin TMDL as an Order in September 2006. The Environmental Protection Agency (EPA) approved the TMDL on September 29, 2006. *"As part of the Willamette TMDL, DEQ developed a Water Quality Management Plan (WQMP) to describe the overall framework for implementing the Willamette Basin TMDL. The WQMP includes a description of activities, programs, legal authorities and other measures for which DEQ and other designated management agencies (DMAs) have regulatory responsibility."*

DEQ has named the City of Keizer as a Designated Management Agency (DMA). A DMA designation gives the City legal authority over the source(s) that contribute pollutants from approximately 4800 acres within the Keizer UGB to the Willamette River. Source(s) may include water from Claggett Creek, Labish Ditch, the in-ground stormwater system, and overland flow. The pollutants of concern for the Willamette Basin TMDL are Bacteria, Mercury, and Temperature.

Claggett Creek has been included on the DEQ integrated report that meets the requirements of the Clean Water Act, Section 303(d). According to the 2010 Integrated Report, Claggett Creek is a Category 5 water quality limited stream for Dissolved Oxygen and E. Coli.

Section 3 City of Keizer Revised SWMP Background

3. 1 Public Works Department

The Public Works Department for the City of Keizer includes a Water Division, a Streets Division, a Stormwater Division, and a Parks Division. The Public Works Department also oversees maintenance and management of the Keizer City Hall. The Water Division includes treatment and distribution. The wastewater system in Keizer is maintained by the City of Salem, but Keizer maintains ownership of the infrastructure. The Stormwater Division is split into two groups with field maintenance in one group, and regulatory/technical staff in the other group.

In February 2008, a Stormwater Program Manager [later reclassified to the Environmental Program Coordinator]was hired to implement the regulatory components of the NPDES SWMP and to write and implement the City's TMDL Implementation Plan for the Willamette Basin. A Stormwater/Streets Field Supervisor was hired in May 2008, followed by 2 additional FTEs, Municipal Utility Workers (MUW).

In July 2009, the City hired a temporary stormwater technician to assist with the inventory data for the Underground Injection Control (UIC) devices. In September 2010, a Senior Environmental Program Technician, and a Environmental Program Technician were hired to assist will all active stormwater programs. In November 2010, an additional temporary stormwater technician was hired to assist with the regulatory components of stormwater programs. The Public Works Department is moving forward with the intent of converting the temporary position into a Full Time Equivalent (FTE) permanent position.

3.2 Program Implementation

The Public Works Department is responsible for implementing the NPDES SWMP within the City boundaries, including the design, construction, operation, maintenance and repair of the stormwater drainage system. The Public Works Department is also responsible for the record keeping, enforcement, reporting, data management, and ordinance development required under the permit. Implementation of the SWMP is primarily the responsibility of the Stormwater Division regulatory/technical staff.

3.3 Program Funding

The initial funding for the stormwater program was developed by City staff and a citizen's committee. The final SWMP for the first permit term was completed in 2004, although the actual permit was issued in March 2007. In order to fully implement the six minimum control measures, the City and citizen's committee proposed a stormwater fee for residents and business owners within Keizer. The first billing cycle started in late 2007. The initial fee was $5.40 billed every other month.

In 2009, the Public Works Department identified a significant need to increase staffing in order to meet the requirements of the NPDES permit, the TMDL Implementation Plan, and

the pending Water Pollution Control Facilities (WPCF) permit. Staff worked with the SWAC, (see Sub-Section 1.2) to propose a fee increase. The efforts were successful, and in August 2010, the City increased the existing fee to $7.65 billed every other month.

The Public Works Department currently has 5.5 FTE staff members and one temporary employee. There is an identified need to convert the temporary position to an FTE in order to maintain existing program implementation.

3.4 Minimum Control Measures / BMPs

As referenced in Section 1.1, the City's SWMP addresses each of the six minimum control measures as required under the NPDES permit. The minimum control measures are listed as follows:

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-construction Runoff Control for New and Re-development
- Pollution Prevention / Good Housekeeping

The BMPs developed for the original permit period have been refined and demonstrate an increased effort in keeping with a second NPDES permit. In some cases, new BMPs have been added to the minimum control measure. See Table 2, Section 4 for a list of proposed BMPs.

Section 5 provides details for each minimum control measure and the associated BMPs. A summary sheet is included for each minimum control measure which includes the specific regulations, a list of the proposed BMPs, and the rational for their development. The summary sheet is followed by a set of fact sheets; one sheet for each of the selected BMPs. The fact sheets include information such as the responsible party for BMP implementation, existing conditions, proposed SWMP activities, measurable goals, and an implementation schedule. The first permit year will begin with the signing of the permit. An overall implementation schedule is included in Table 3 at the end of Section 6. City staff has utilized a similar format for the Revised SWMP as was developed for the first SWMP for ease of review and reference.

The Revised SWMP also includes measures intended to make the overall SWMP more robust and work toward the goal of reducing MS4 discharges of pollutants to the maximum extent practicable (MEP). Additional measures were included in the first SWMP for record keeping and reporting. This revised SWMP includes measures that cover fiscal

accountability, elevated enforcement activities, and a preliminary stormwater retrofit program . The additional measures are listed as follows:

- Budget Analysis (Annual)
- Enforcement Response Plan
- Stormwater Retrofit Program
- Record Keeping and Reporting

A discussion of the proposed additional measures are included in Section 6. They have been added to the implementation timeline covered in Table 3.

3.5 TMDL Implementation Plan / 303(d) Listed Waterways

The Total Maximum Daily Load (TMDL) Implementation Plan, approved by DEQ in April 2008, was to run concurrently with the SWMP for the first permit period. As such, both documents share a number of duplicate BMPs. Yearly reporting for the TMDL Implementation Plan is completed with the Annual Report for the NPDES permit.

The Revised SWMP was written to include BMPs that mesh with the pollutants of concern for local 303(d) listed streams as well as the Willamette Basin TMDL. When the City's TMDL Implementation Plan is revised, it will reference the appropriate BMPs in this document that pertain to water quality limited waterways in the region.

Section 4 Implementation Findings from the First Permit Term

4. 1 Overview

Schedule B(3) of the NPDES permit #102904 states that the *"renewal application package must incorporate the implementation findings from the current permit term to support the proposed SWMP for the renewal permit".*

The City of Keizer received correspondence from the Department of Environmental Quality (DEQ) on May 13, 2011 which provided guidance for the permit renewal process. In order to provide a comprehensive evaluation of the current SWMP, Stormwater Division staff developed a separate document, the *Stormwater Management Plan Evaluation for NPDES Permit #102904.* The referenced document, which is being submitted in the permit renewal application package, provides a detailed accounting of activities during the first permit term. Section 2 of the referenced document addresses program evaluation for each BMP in the current SWMP.

4.2 Rationale for Proposed Changes to the SWMP

The rationale for modifications to the revised SWMP is discussed in detail in Section 5 on each summary sheet associated with the referenced minimum control measure. As an overview, the information provided in this Section offers some insight as to how new BMPs and measurable goals were crafted. The following list is a short summary of new BMPs or measures included in the revised SWMP:

- An emphasis on training is being proposed to ensure that all Public Works personnel understand their responsibilities in regard to stormwater regulations and programs.

- As was indicated earlier, the City incorporated in 1982. Cleaning activities (other than catchbasin cleaning), inspection, maintenance, and repair has been somewhat limited. As such, the City will initiate an inspection of the piped system during the 5 year permit term in order to develop a repair schedule and ascertain the condition of the overall system. This activity is expected to generate the need for a stormwater capital improvement plan (CIP).

- While staff developed creative documents and operational plans over the first permit term, given limited staffing, many of these documents were created in a fairly short time frame without the benefit of thorough evaluation. The Public Works Department will be reviewing and revising existing documents.

- An Enforcement Response Plan (ERP) will be created in order to assist Public Works staff with following the proper protocol for offenders. This document will provide an even playing field for all involved.

- An annual budget analysis will alert elected officials and decision makers to deficiencies in program funding. This activity will allow the Department to plan for future needs.

- With an eye toward retrofitting activities and flow reduction, the Public Works Department will start the process of identifying project areas for linear bio-swales throughout the community. These projects will serve as on the ground demonstration that stormwater can be managed, in some instances, without the traditional piped system that discharges to a waterway. Maintenance of these facilities will provide a water quality educational opportunity for City staff.

See Table 3.1 in the Stormwater Management Plan Evaluation document for at 'at-a-glance' overview of modifications to current BMPs.

Table 2
Summary of Keizer's NPDES Revised SWMP

BMP	BMP Title
MCM #1 – Public Education and Outreach (PE)	
PE-1	Utilize advisory committee to develop a Public Education program
PE-2	Statistical analysis / public awareness of stormwater issues
PE-3	Utilize annual Consumer Confidence Report for citywide outreach
PE-4	Update stormwater website
PE-5	Provide staff support to Claggett Creek Watershed Council
MCM #2 – Public Involvement and Participation (PI)	
PI-1	Develop program evaluation methodology. Utilize new or existing advisory committee for annual review of stormwater program and adaptive management strategies
PI-2	Install 125 to 150 storm drain markers annually
PI-3	Utilize community groups and/or volunteers to maintain restoration sites
MCM#3 – Illicit Discharge Detection and Elimination (ID)	
ID-1	Revise IDDE Plan. Include dry weather inspections
ID-2	Develop criteria for high risk areas
ID-3	Link information to GIS and update annually
ID-4	Develop inspection and inventory plan for privately owned stormwater facilities connected to MS4 infrastructure. Conduct inventory and inspection.
ID-5	Analyze data and develop management strategy
MCM#4 – Construction Site Runoff (CS)	
CS-1	Conduct internal EPSC training for applicable City staff. Conduct annual refresher training. Obtain specialized training for site inspectors
CS-2	Develop and maintain an inventory of active construction sites that require a CSPPP
CS-3	Revise existing CSPPP and ordinance to require low impact development elements
CS-4	Develop separate erosion control hotline
MCM#5 – Post Construction Runoff in New and Re-Development (DS)	
DS-1	Revise Public Works Design Standards and Development Code to include flow reduction elements, limit impervious area, and require storm volume retention
DS-2	Conduct plan review, inspections, and enforcement activities as specified
DS-3	Conduct annual training for applicable personnel
MCM #6 – Pollution Prevention / Good Housekeeping (OM)	
OM-1	Review and revise existing O & M plan. Conduct annual training
OM-2	Annually inspect 10% of publically owned infrastructure. Develop and implement a repair schedule
OM-3	Develop a training schedule for the applicable elements listed in the SWMP
OM-4	Clean 50% of MS4 catchbasins annually

OM-5	Implement augmented street sweeping program annually
Budget Analysis (BA)	
BA-1	Provide annual fiscal analysis of the stormwater program to DEQ with the Annual Report
Enforcement Response Plan (ERP)	
ERP-1	Develop and implement an Enforcement Response Plan
ERP-2	Conduct annual training for applicable City staff
Stormwater Retrofit Program (SR)	
SR-1	Develop a strategy and plan for initial retrofit projects
SR-2	Develop maintenance and inspection plan for retrofit projects
SR-3	Complete identified projects annually based on project schedule
SR-4	Develop a downspout disconnection plan
Record Keeping and Reporting (RR)	
RR-1	Develop an electronic stormwater database to track SWMP program elements including repair and maintenance activity
RR-2	Maintain spatial information for private stormwater infrastructure. Add spatial information for SWMP program elements

Section 5 - Minimum Control Measures / Fact Sheets

5.1 Minimum Control Measure #1 – Public Education (PE)

Permit Requirements

According to the federal NPDES MS4 Phase II rules, the Phase II small operator [permittee] is required to implement a public education program. 40 CFR 122.34(b)(1) requires implementation of a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges on waterways and the steps that the public can take to reduce pollutants in stormwater runoff. To meet the intent of this minimum control measure the permittee is required to determine the appropriate best management practices (BMPs) and measurable goals for public education and outreach.

Applicable City of Keizer BMPs

PE-1 Utilize an advisory committee to develop a Public Education program to include one or more target audiences.

PE-2 Utilize a statistical method to assess public awareness of stormwater issues

PE-3 Utilize the annual drinking water Consumer Confidence Report (CCR) to distribute stormwater educational material citywide

PE-4 Annually update the City's Stormwater website

PE-5 Provide support to the Claggett Creek Watershed Council

Rationale

The City of Keizer selected the five BMPs listed above in order to enhance the existing public education and outreach program and ensure the continuance of the good work established in the first permit period. The BMPs proposed for Public Education/Outreach address the Willamette Basin TMDL as well as the applicable pollutants that apply to Claggett Creek, a 303(d) listed waterway.

During the first permit period Stormwater Division staff directed most educational efforts toward distribution of educational materials during public events such as the annual Public Works Open House, the local Iris Festival, and other community events. Staff has been creative in finding unique ways to reach the public, but the public education program is not fine-tuned or focused. Using a new or existing advisory committee to help develop a formal education and outreach program will allow the City to reach target audiences with key messages. In PY 4 the City will develop a statistical method to assess public awareness of

stormwater issues in order to assess deficiencies in the new program and plan for revisions if necessary.

The City has specified use of the annual Consumer Confidence Report (CCR) as an outreach tool in the Revised SWMP. The City has used the CCR as a means to distribute stormwater education throughout the community annually throughout the first permit term. The CCR is delivered to all Keizer residents including citizens living in multi-family housing. Staff has received good feedback from members of the community in regard to the CCR insert. Given the effectiveness of this tool, Stormwater personnel will continue this activity through the second permit period starting in PY 1.

As was discussed in the *Stormwater Management Plan Evaluation,* Subsection 2.2 Summary, the City of Keizer will continue to participate with the Mid-Willamette Outreach Group (MWOG). The City acknowledges the importance of promoting regional messages regarding stormwater. MWOG will be hosting an erosion control workshop in February 2012. The Marion-Polk Home Builders Association will co-host the event.

The Public Works Department has a website that contains information about all Divisions and activities within the Department. The website should be updated and refined to provide more stormwater related information to the public, and to include interactive tools that will allow access to the most up-to-date information. While Stormwater Division staff has made recent progress on this task, regular updates need to be completed on a routine basis.

The Claggett Creek Watershed Council was inactive at the start of the first permit term, but remaining members have made a significant effort to stay active and involved in community projects. It has become apparent that the group clearly benefits by partnering with the Stormwater Division for projects in the community. City staff will continue to attend meetings and provide technical support to the group. Staff is preparing to approach Willamette University about the possibility of using a senior student to develop a thesis project around developing a plan for recruitment options for the watershed council. The council does not receive funding from the Oregon Watershed Enhancement Board (OWEB), but does receive limited funding from Salem Electric.

BMP PE-1

Utilize an advisory committee to develop a Public Education program to include one or more target audiences

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has developed outreach materials including brochures, resource lists, a traveling display board, and more. These products were created without the benefit of a specifically designed outreach plan. The Environmental Program Coordinator has routinely given public presentations to neighborhood associations, City Council, and the Planning Commission.

BMP Description and Proposed Activities

Public Works personnel will utilize a new or existing advisory committee to facilitate the development of a formal Public Education program that will include the identification of targeted audiences and key messages. Education efforts will include topics on local pollutants of concern including bacteria, mercury, temperature, and dissolved oxygen.

Measurable Goals

1. Utilize a new or existing advisory committee, develop a public education program that identifies target audiences and includes key messages.
2. Annually develop materials, presentations, products, or utilize other identified tools to educate the community and target audience.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Utilize advisory committee to develop a Public Education program	Implement the program	Implement the program	Implement the program	Implement the program

BMP PE-2

Utilize a statistical method to assess public awareness of stormwater issues

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer designed a stormwater survey in 2009 to collect information about how the community uses local waterways and the willingness to change behavior. The results were inconclusive. Staff could not determine if questions were were answered honestly or if answers were representative of social perception.

BMP Description and Proposed Activities

Stormwater personnel will develop a statistical method to analyze public awareness and understanding of stormwater issues. This activity will take place in PY 4 to evaluate activities in the second permit term and to prepare for activities in the third permit term

Measurable Goals

1. Develop a statistical method to analyze public awareness of stormwater issues
2. Provide results in the Annual Report for PY4
3. Publicize results for the public

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
			Statistical analysis for public awareness	

BMP PE-3

Utilize the annual drinking water Consumer Confidence Report (CCR) to distribute stormwater educational material citywide

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer currently utilizes the annual CCR to provide stormwater education to the community. The CCR is distributed to all citizens of Keizer including those residing in apartment complexes or multi-family facilities. The CCR is generally completed in April or May of each year.

BMP Description and Proposed Activities

Public Works personnel will continue to utilize the annual CCR to provide stormater education to the community. Topics will change annually based on program factors and timely community issues.

Measurable Goals

1. Annually produce an insert for the CCR containing pertinent stormwater information.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Utilize CCR on an annual basis	Utilize CCR on an annual basis	Utilize CCR on an annual basis	Utilize CCR on an annual basis	Utilize CCR on an annual basis

BMP PE-4

Update the City's Stormwater website

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer Public Works Department has a website that contains information about the Stormwater Division. The site was not consistently updated with current stormwater regulatory, program, or system information during the first permit term. The site has been refined, but a substantial amount of work needs to be completed.

BMP Description and Proposed Activities

City staff will redesign and update the Stormwater Division website to provide current and useful information to the public in regard to the SWMP, TMDL Implementation Plan, and UIC program.

Measurable Goals

1. Redesign the Stormwater Division portion of the Public Works website in PY1
2. Update the website annually
3. Post annual reports on the website

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Redesign the stormwater website	Update website	Update website	Update website	Update website

BMP PE-5

Provide support to the Claggett Creek Watershed Council

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

Stormwater Division staff has provided support to the Claggett Creek Watershed Council during the first permit term. Staff attends monthly meetings. The watershed council is currently partnering with the City of Keizer on restoration projects within the City.

BMP Description and Proposed Activities

Stormwater staff will continue to provide support to the Claggett Creek Watershed Council by attending monthly meetings, providing technical support when appropriate, and partnering with the Council on restoration activities in the watershed. Staff will continue to include educational components related to the temperature, mercury, bacteria, dissolved oxygen and other pollutants of concern within the region.

Measurable Goals

1. Attend monthly meetings
2. Involve the watershed council members in restoration activities
3. Maintain records of staff participation with Council activities

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Provide staff support to the Claggett Creek Watershed Council	Provide staff support to the Claggett Creek Watershed Council	Provide staff support to the Claggett Creek Watershed Council	Provide staff support to the Claggett Creek Watershed Council	Provide staff support to the Claggett Creek Watershed Council

5.2 Minimum Control Measure #2 – Public Involvement / Participation (PI)

Permit Requirements

According to the federal NPDES MS4 Phase II rules, the Phase II small operator [permittee] is required to provide opportunities for citizens to participate in program development and implementation, including effectively publicizing public hearings and /or encouraging citizen representatives on a stormwater management panel.

EPA believes that the public can provide valuable input and assistance to a regulated small MS4's municipal stormwater management program and, therefore, suggests that the public be given opportunities to play an active role in both the development and implementation of the program. An active and involved community is crucial to the success of a stormwater management program because it allows for broader public support, shorter implementation schedules, a broader base of expertise and economic benefits, and a conduit to other programs.

Applicable City of Keizer BMPs

PI-1 Develop stormwater program evaluation methodology. Utilize an advisory committee for annual review of the stormwater program and application of adaptive management

PI-2 Install 125 - 150 storm drain markers annually

PI-3 Utilize community groups and/or volunteers to maintain restoration sites

Rationale

The City of Keizer selected the three BMPs listed above in order to enhance the existing public involvement and participation activities facilitated by the Public Works Department. The BMPs proposed for Public Involvement/ Participation address the Willamette Basin TMDL as well as the applicable pollutants that apply to Claggett Creek, a 303(d) listed waterway.

The Stormwater Division has utilized the Stormwater Advisory Committee (SWAC) to review the stormwater program periodically over the first permit term, but no evaluation methodology has been developed to assess program status. Development of a more formal process for program evaluation will produce useful findings to the committee, as well as staff. Program evaluation findings are intended to help the Stormwater Division staff apply adaptive management for the BMPs listed in the SWMP. Conducting these activities on an annual basis will ensure a quick and regular response for required actions or program alterations such as adaptive management measures.

The Public Works Department has utilized community groups for storm drain marking during the first permit term. In order to elevate the effort, the goal for this BMP will be to install 125-150 markers per year. The first permit required handouts or door-hangers for educational outreach during the installation project. Stormwater Division staff has found it useful to have the community group play a role in the creation of the outreach material. As such, the outreach product designed will be suitable for the community group and level of understanding.

The BMP as originally written did not take into account the City had no inventory of catchbasins, and structures were not delineated as to which were MS4 catchbasins and which were associated with underground injection control (UIC) systems. Additional background for this BMP is addressed in the *Stormwater Management Plan Evaluation* under BMP PI-3, page 13.

BMP PI-3 addresses ongoing maintenance for City restoration sites. The City of Keizer currently has several small project sites that require annual maintenance. Stormwater Division staff recognizes the need to conduct inspection and maintenance activities in order to ensure long term function. The City will utilize volunteer or community groups for maintenance or installation activities. These types of opportunities provide an 'outdoor education' opportunity that resonates throughout the community.

BMP PI-1

Develop stormwater program evaluation methodology. Utilize an advisory committee for annual review of the stormwater program

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer utilizes the existing advisory committee or City staff to annually review the stormwater program. The City has not been proactive in implementing adaptive management during the first permit term. Adaptive Management was utilized for the City's TMDL Implementation Plan.

BMP Description and Proposed Activities

Develop stormwater program evaluation methodology to be used in conjunction with the annual review of the stormwater program and SWMP. The evaluation is expected to identify the need and application process for adaptive management.

The City of Keizer will utilize the 'five' operational phases of adaptive management as outlined by DEQ. The operational phases are listed as follows:

1) program implementation,
2) data and information collection,
3) evaluation,
4) needs identification,
5) program modification

Measurable Goals

1. City staff will develop stormwater program evaluation methodology during PY1
2. An advisory committee will be used to annually review the program according to the developed methodology
3. The need for adaptive management will be assessed annually. Staff will maintain documentation for these activities.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Develop stormwater program evaluation methodology	Utilize advisory committee for annual program review	Utilize advisory committee for annual program review	Utilize advisory committee for annual program review	Utilize advisory committee for annual program review

BMP PI-2

Install 125 to 150 storm drain markers annually

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has utilized community groups to install storm drain markers during the first permit term. The BMP for storm drain marking as written for the first permit term did not account for the total number of structures or those that discharged to the subsurface versus those that discharged to systems that outfall to waterways. The Public Works Department now has a comprehensive inventory for storm drains.

BMP Description and Proposed Activities

Public Works personnel will work with community groups for storm drain marking projects throughout the City. Marking will occur on those structures which collect water that is discharged to waterways. UIC catchbasins will be identified by a different marker and will not be included in this activity.

Measurable Goals

1. Install 125-150 storm drain markers annually utilizing community groups
2. Develop an outreach product in conjunction with each activity that is suitable for the community group
3. Utilize the annual report to catalog group activities and outreach products

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Install storm drain markers annually	Install storm drain markers annually	Install storm drain markers annually	Install storm drain markers annually	Install storm drain markers annually

BMP PI-3

Utilize community groups and/or volunteers to maintain restoration sites

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has several restoration sites. Public Works staff has partnered with groups such as the Claggett Creek Watershed Council and SOLV volunteers for site maintenance.

BMP Description and Proposed Activities

Beginning in Permit Year 1, the Public Works Department will recruit and utilize community groups and/or volunteers for long term maintenance of restoration sites adjacent to local waterways. These activities will include educational content regarding the pollutants of concern in the Willamette Basin.

Measurable Goals

1. Track activities for each restoration site including the date and number of volunteers. The goal for this BMP is to conduct a minimum of two projects per year.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Utilize volunteers to maintain restoration sites	Utilize volunteers to maintain restoration sites	Utilize volunteers to maintain restoration sites	Utilize volunteers to maintain restoration sites	Utilize volunteers to maintain restoration sites

5.3 Minimum Control Measure #3 – Illicit Discharge Detection and Elimination (ID)

Permit Requirements

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement and enforce an illicit discharge detection and elimination program. This program must include the following:

- A storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;
- Through an ordinance, or other regulatory mechanism, a prohibition (to the extent allowable under State, Tribal, or local law) on non-stormwater discharges into the MS4, and appropriate enforcement procedures and actions;
- A plan to detect and address non-stormwater discharges, including illegal dumping, into the MS4;
- The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste; and
- The determination of appropriate BMPs and measurable goals for this minimum control measure.

Applicable City of Keizer BMPs

ID-1 Revise IDDE Plan. Include dry weather inspection schedule

ID-2 Document criteria to identify illicit discharge 'high risk' areas

ID-3 Map 'high risk' areas in GIS

ID-4 Develop and implement an inspection and inventory plan for privately owned stormwater facilities connected to MS4 infrastructure. Link inventory information to GIS

ID-5 Analyze inspection data and prepare a management strategy for response to problematic private facilities. Implement the strategy

Rationale

The City of Keizer selected the five BMPs listed above in order to enhance the existing Illicit Discharge Detection and Elimination (IDDE) program. The BMPs proposed for Illicit Discharge Detection and Elimination address the Willamette Basin TMDL as well as the applicable pollutants that apply to Claggett Creek, a 303(d) listed waterway.

The BMPs under this minimum control measure have been expanded to include development of a process to inspect privately owned stormwater facilities that are connected to publicly owned infrastructure that discharges to waterways. Stormwater personnel will continue to complete annual dry weather outfall inspections.

The IDDE plan was developed in 2008. Stormwater personnel were relatively inexperienced at inspection procedures and the overall purpose for this BMP. While the existing IDDE plan has been useful for the first permit period, there are likely portions of the document that should be revised to capture more relevant information and streamline inspections and reporting data.

ID-2 and ID-3 are new BMPs. Over the first permit term, Stormwater staff has recorded information in regard to illicit discharge occurrences. For the revised SWMP, criteria will be established using information such as land use, past enforcement actions, or hazardous material storage to identify 'high risk' areas which may indicate an increased chance of illicit discharge. Developing these criteria to identify potential problem areas in the field will allow for a more targeted and efficient inspection effort.

Stormwater maintenance personnel conduct dry weather outfall inspections, but staffing levels do not allow for routine inspections at other times during the year. As such, mapping identified 'high risk' areas in the GIS system will allow staff to quickly and efficiently respond to spills. The information in the GIS system will include 'upstream' uses, helping to pinpoint likely sources in the event of a discovered spill or discharge. This will allow staff to quickly ascertain where a spill may have originated.

Approximately 95% of the City's publically owned stormwater infrastructure has been added to ArcMap. As discussed in BMP OM-2, the City is developing a process to inspect the system with the intent of identifying condition and developing a repair schedule. The Public Works Department will utilize a contractor to TV inspect storm pipe.

In order to evaluate privately owned infrastructure, BMP ID-4 and ID-5 set out a process to inventory and inspect those private systems that are connected to the City's MS4. The overall goal of these BMPs is to collect information about the location and condition of private infrastructure to initiate required and regular maintenance by the property owner. Private infrastructure will be inspected on commercial, industrial, and multifamily property.

Staff expects to take 3 permit years to notify property owners, complete the inventory and inspection process, link the data to ArcMap, and analyze the data which will result in a

management strategy. During the inspection process, staff will have the opportunity to require repair action for those structures most in need of maintenance. Overall, the City hopes to develop an ongoing program that can be implemented into the next permit term and on a routine basis.

BMP ID-1

Revise IDDE Plan. Include outfall inspection schedule

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer developed an internal Illicit Discharge Detection and Elimination (IDDE) Plan in 2008. The City adopted the Stormwater Discharge Ordinance in 2009. City staff maintains records of illicit discharge actions and responses.

BMP Description and Proposed Activities

Public Works personnel will review and revise the existing IDDE plan to correct any deficiencies in the existing plan. Stormwater personnel currently inspect all outfalls on an annual basis. The revised plan will include an appropriate dry weather inspection schedule.

Annual training will be held for Public Works personnel

Measurable Goals

1. Develop a revised IDDE plan during PY 1
2. Conduct annual refresher training for Public Works personnel in PY 1 and subsequent years as needed

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Revise IDDE plan	Implement	Implement	Implement	Implement

BMP ID-2

Document criteria to identify illicit discharge 'high risk' areas

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has recorded response actions in regard to illicit discharges over the first permit term. City staff responds to reports of potential illegal activity when notified.

BMP Description and Proposed Activities

Beginning in PY 1, criteria will be established based on land use, past history of discharge or dumping, hazardous material storage or use, etc, to identify 'high risk' areas prone to illicit discharge issues. Developing these criteria and using them to identify potential problem areas in the field will allow for a more targeted and efficient inspection effort. This information will be developed in preparation for BMP ID-3

Measurable Goals

1. Develop applicable criteria to identify high risk areas potentially prone to illicit discharge in permit year 1
2. Provide updated information in the annual report

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Develop criteria for high risk areas				
	Update annually	Update annually	Update annually	Update annually

BMP ID-3

Map potential 'high risk' areas in GIS

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

Stormwater personnel maintain records in regard to known illicit discharges, illegal dumping, and illegal connections. No data has been collected regarding potential areas within the City that may be linked to higher risk illegal activity.

BMP Description and Proposed Activities

Beginning in PY 2 Stormwater Division staff will map identified 'high risk' areas in the GIS system using the information obtained in BMP ID-2. This information will define known 'upstream' uses, helping to pinpoint likely sources of illicit discharge or spill.

Measurable Goals

1. Map identified 'high risk' areas in the GIS system
2. Update information annually

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
	Map high risk areas	Update annually	Update annually	Update annually

BMP ID-4

Develop and implement an inspection and inventory plan for privately owned stormwater facilities connected to MS4 infrastructure. Link findings to ArcMap.

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The Public Works Department has public infrastructure linked to ArcMap. Privately owned stormwater systems connected to the public system have not been inventoried to identify consistency with as-builts. The City has not yet inspected private systems to determine function or condition.

BMP Description and Proposed Activities

In order to reduce pollutants discharged to local waterways to the maximum extent practicable (MEP), the City of Keizer will develop a plan to inspect private stormwater facilities throughout the city starting in PY 2. Initial notification for property owners will be completed in PY 2. Inspection and inventory will occur in PY 3. Adding findings to the GIS system is expected to occur in PY 4.

Measurable Goals

1. In PY 2 Stormwater staff will develop an inspection and inventory plan for privately owned stormwater facilities connected to publicly owned stormwater infrastructure.
2. Perform inventory and inspection in PY 3
3. Link findings to ArcMap

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
	Develop an inspection and inventory plan for privately owned stormwater facilities	Inventory and inspection	Link information to ArcMap	

BMP ID-5

Analyze data from field work and prepare a management strategy for private stormwater facilities. Implement the management plan

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The Public Works Department has public infrastructure linked to ArcMap. Privately owned stormwater systems connected to the public system have not been inventoried to identify consistency with as-builts. The City has not inspected private systems to determine function or condition.

BMP Description and Proposed Activities

The inventory and inspection activities data from ID-4 will be analyzed and a management plan will be developed for how the City intends to inspect private facilities on a rotating basis in the future. The plan will take into account overall condition based on use, and percentage of property within the City. Implementation of the program will occur in PY 5.

Measurable Goals

1. Analyze data and develop management plan in PY 4
2. Implement program according to management plan in PY 5

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
			Analyze data and prepare management strategy	Implement plan

5.4 Minimum Control Measure #4 – Construction Site Runoff (CS)

Permit Requirements

According to the Final Phase II rule, the permittee must develop, implement, and enforce a program to reduce pollutants in any stormwater runoff to the permittee's small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Additional provisions must be included for activities less than one acre in size if the construction activity is part of a larger common plan of development that would disturb one acre or more. The permittee's program must include:

1. An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State or local law.

2. Requirements for construction site operators to implement appropriate erosion and sediment control best management practices (BMPs).

3. Requirements for construction site operators to prevent or control waste that may cause adverse impacts to water quality such as discarded building materials.

4. Procedures for site plan review.

5. Procedures for receipt and consideration of information submitted by the public.

6. Procedures for site inspection and enforcement of control measures.

Applicable City of Keizer BMPs

CS-1 Conduct internal erosion prevention sediment control (EPSC) training for applicable City staff. Conduct annual refresher training. Obtain specialized training for site inspectors.

CS-2 Develop and maintain an inventory of active construction sites that require a Construction Site Pollution Prevention Plan (CSPPP).

CS-3 Revise existing CSPPP and ordinance to require flow reduction elements.

CS-4 Develop separate hotline for erosion control complaints from the public in PY 3 or before as needed.

Rationale

The City of Keizer selected the four BMPs listed above in order to enhance the existing construction site runoff program and ensure the continuance of the good work established

in the first permit period. The BMPs proposed for Construction Site Runoff address the Willamette Basin TMDL as well as the applicable pollutants that apply to Claggett Creek, a 303(d) listed waterway.

City of Keizer Public Works staff will all have the opportunity to interact with the development /building community in varying capacities. Stormwater staff believes that EPSC training will be beneficial for all Public Works personnel. This department-wide training will help provide additional support for the development / building community. The Public Works Department will have several employees that are designated as inspectors. In order to ensure that they have the technical skills needed to support building activities in the community, the City will see that they receive specialized training and/or certification.

The Public Works Department developed a Construction Site Pollution Prevention Plan (CSPPP) in the first permit term. Stormwater staff will link ongoing construction activities to the GIS system in order to readily access information about each active site.

The CSPPP was developed and adopted late in the first permit term. While the developed program goes beyond the minimum requirements for this minimum control measure, staff felt it was beneficial to the City as whole to enact additional BMPs that might be found in the second permit term in order to keep the program flowing smoothly over time. With that in mind, the program will be updated to require flow reduction elements for residential subdivision development of an acre or more in size and those activities that fall under the Large Scale Construction Site Pollution Prevention Plan (CSPPP) This change will require a revision to the existing CSPPP. Flow reduction elements will be included with plan submittal.

Finally, the establishment of an erosion control hotline was included in the SWMP for the first permit term. In lieu of developing a hotline, the Public Works Department expanded the 'after hours' phone system to include a menu option for callers to reach City employees responsible for Storm and Streets issues. The system has worked well to date, given development has been minimal and the Construction Site Runoff Program was completed so late in the permit term.

However, Keizer expects a sizeable expansion of the urban growth boundary within the next few years which will open the door to development within the City. Stormwater staff has proposed that the hotline be established in PY 3 to meet the needs of community expansion.

BMP CS-1

Conduct internal erosion prevention sediment control (EPSC) training for applicable City staff to include annual refresher training. Obtain specialized training for site inspectors

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has developed a Construction Site Runoff program that includes plan submittal, inspections, and is regulated by ordinance. The Constructions Site Runoff program was adopted in 2011. The City requires erosion control plan submittal for disturbance of 500 sq ft or more.

BMP Description and Proposed Activities

All Public Works personnel will be required to participate in EPSC training in order to assist the development/building community with design and construction for new projects. Training will occur annually.

Those Public Works employees designated as inspectors will receive specialized training that will allow them to provide technical guidance through the term of the project. If certification is received, recertification will occur as designated through the applicable program.

Measurable Goals

1. In PY 1 conduct EPSC training for all Public Works personnel. Conduct annual refresher training
2. In PY 2 obtain specialized EPSC training for City designated personnel

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Conduct EPSC training for applicable City staff.	Refresher training	Refresher training	Refresher training	Refresher training
	Obtain specialized training for City inspectors			

BMP CS-2

Develop and maintain an inventory of active construction sites that require a Construction Site Pollution Prevention Plan (CSPPP) and link to GIS

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has developed a Construction Site Runoff program that includes plan submittal, inspections, and is regulated by ordinance. The Constructions Site Runoff program was adopted in 2011

BMP Description and Proposed Activities

Stormwater staff will link CSPPP elements to the ArcMap system. This BMP will allow Public Works staff to query information about active sites throughout each permit year.

Measurable Goals

1. Link active development sites requiring a CSPPP plan to the City's GIS
2. Update information as permits are issued and throughout the term of the project

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
	Develop an inventory of construction sites and link to ArcMap	Update inventory	Update inventory	Update inventory

BMP CS-3

Revise existing CSPPP to require flow reduction elements

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has developed a Construction Site Runoff program that includes plan submittal, inspections, and is regulated by ordinance. The Constructions Site Runoff program was adopted in 2011. The plan in its entirety regulates development starting with a threshold of 500 sq feet.

BMP Description and Proposed Activities

Revise the existing CSPPP and the required plan for single family development to include a requirement for flow reduction elements.

Measurable Goals

1. Track measures used on new projects.
2. Provide findings in annual report.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
		Revise CSPPP and ordinance to require flow reduction elements	Implement	Implement

BMP CS-4

Establish hotline to receive complaints from the public

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City has utilized an after-hours number to meet the intent of the BMP. Citizens with inquiries or emergencies can call receive a response 24 hours a day, 7 days a week. The telephone menu directs the caller to various options, one of which includes 'Streets or Stormwater' emergencies. No formal process has been developed for documentation of calls or follow-up activities. The Public Works Department for the City of Keizer has conducted business on a response to need level. Phone calls coming in after business hours are addressed in a timely fashion, but during the day there is no system to tracks calls, responders, or follow-up activities.

BMP Description and Proposed Activities

Starting in PY 3 the City will establish a hotline to receive complaints from the public. The timeline for this BMP is expected to be in keeping with potential future development that may be created with an urban growth boundary (UGB) expansion.

Measurable Goals

1. Establish and begin operation of a hotline by the end of PY 3
2. Maintain a log of incoming phone calls throughout PY 3 through PY 5

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
		Establish hotline to receive complaints from the public	Operate hotline	Operate hotline

5.5 Minimum Control Measure #5 – Post Construction / Development Standards (DS)

Permit Requirements

According to the Final Phase II rule, the permittee must develop, implement, and enforce a program to ensure the reduction of pollutants in stormwater runoff to the maximum extent practicable (MEP) from new development and redevelopment projects that disturb one acre or more, or less than one acre if they are part of a larger common plan of development or sale, and if they discharge into the permittee's stormwater drainage system. The permittee's program must ensure that controls are in place that would prevent or minimize water quality impacts.

The permittee must develop and implement strategies that include a combination of structural and/or non-structural BMPs appropriate for the permittee's community, and

- Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law;
- Ensure adequate long-term operation and maintenance of BMPs; and
- Ensure adequate enforcement of ordinance or alternative regulatory program(s).

Applicable City of Keizer BMPs

DS-1 Revise the existing Public Works Design Standards to incorporate flow reduction, limit impervious area, and define a minimum storm volume to be retained on site. This BMP applies to new and re-development.

DS-2 Implement the revised water quality standards for new and re-development and conduct plan reviews, inspections, and enforcement activities

DS-3 Conduct annual training for program components for Public Works personnel

Rationale

The City of Keizer selected the three BMPs listed above in order to enhance the post construction runoff program. The BMPs proposed for Post-Construction Stormwater Runoff address the Willamette Basin TMDL as well as the applicable pollutants that apply to Claggett Creek, a 303(d) listed waterway.

The City of Keizer is built-out and little if any buildable land is available for large scale residential subdivisions of 1 acre or more in size. Existing opportunities for residential development are restricted to infill construction. A UGB expansion is expected at some point in the next permit term.

The City of Keizer has started the process of using innovative development within the community to help resident's adjust to future trends for stormwater. The City's new Civic Center and City Hall is a Silver Leed Certified building utilizing bioswales for capture and treatment of stormwater from parking lots and the roof of the facility. The building was completed in 2009.

In addition to the new City Hall, construction will begin in the fall of 2011 for roadside swales on approximately 1.5 miles of Chemawa Rd N in Keizer. The roadway currently has no existing stormwater infrastructure. Water is absorbed in front yards, City rights of way, and roadside ditches. An Oregon Department of Transportation (ODOT) grant will allow the City to capture and treat all stormwater runoff purely through surface infiltration.

During the first permit period, the City of Keizer was able to require low impact development (LID) for commercial property within the City. Large scale commercial development has occurred, and is being planned for the area known as Keizer Station which is adjacent to Interstate 5. LID is currently required through the City of Keizer Design Standards and Development Code. These documents were adopted by ordinance, and reference King County, Washington and the City of Portland Bureau of Environmental Services for design alternatives.

Although current code has allowed the City to require LID for development in Keizer, the Design Standards and Development Code need to be revised to include specific requirements for capture and treatment of stormwater. Under BMP DS-1, the City will revise existing code to capture and treat 80% of stormwater in new and re-development.

BMP DS-2 was developed to ensure that plan review, inspections, and enforcement activities are conducted for the revised Design Standards and Development Code. Staff expects this work to commence in PY 3 with implementation to occur during PY 4 and PY 5.

Finally training will be held for applicable staff with refresher training to occur in subsequent years as needed.

BMP DS-1

Revise Public Works Design Standards and Development Code to include capture and treatment for new and re-development. Formally adopt revisions through public process

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

During the first permit period, the City of Keizer was able to require low impact development (LID) for commercial property within the City through the Design Standards and Development Code. No large scale residential property is available for expansion, so these activities have occurred almost exclusively on commercial property. The Design Standards and Development Code were adopted by ordinance, and reference King County, Washington and the City of Portland Bureau of Environmental Services for design alternatives.

BMP Description and Proposed Activities

In PY 1 revise Public Works Design Standards and Development Code to include flow reduction, limit impervious surface, and retain established storm volume. New standards will require capture and treatment of 80% of stormwater in new and re-development.

Measurable Goals

1. Adopt revised Design Standards and Development Code by the end of PY 2.
2. Implement new standards in PY 3

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Revise Design Standards / Development Code	Continue and complete revision work	Implement new standards		

BMP DS-2

Implement the revised water quality standards for new and re-development and conduct plan reviews, inspections, and enforcement activities.

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City currently conducts plan review and inspections for the applicable commercial development referenced in this BMP. No formal enforcement activities are conducted.

BMP Description and Proposed Activities

The Public Works Department will develop a formal process for plan review, inspections and enforcement activities as a result of the revisions of the Design Standards and Development Code referenced in BMP DS-1. Staff anticipates using a process similar to that which was developed for the Construction Site Runoff program.

Measurable Goals

1. Develop a formal process for plan review, inspections and enforcement activities for the revised Design Standards and Development Code
2. Annually track program elements including enforcement activities

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
		Implement the revised standards for new and re-development and conduct plan reviews, inspections, and enforcement activities.	Implement revised standards	Implement revised standards

BMP DS-3

Provide training for applicable city employees in revised Design Standards, Development Code, and implementation factors

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

No formal training has been conducted for applicable City staff for flow reduction, stormwater treatment, or LID practices. Some employees are familiar with these elements

BMP Description and Proposed Activities

Training will be provided for applicable City personnel in regard to the revised Design Standards and Development Code referenced in BMP DS-1. In addition, training will include plan review components, enforcement procedures, and BMP installation techniques. Refresher training will be held annually as needed.

Measurable Goals

1. Conduct training for applicable City staff in PY 3 and in subsequent years as needed

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
		Train City employees regarding implementation of revised water quality development standards	Refresher training as needed	Refresher training as needed

5.6 Minimum Control Measure #6 – Pollution Prevention in Municipal Operations (OM)

Permit Requirements

According to the federal NPDES MS4 Phase II rules, the Phase II small operator [permittee] is required to develop and implement an operations and maintenance (O & M) program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. In addition, the permittee's program must include employee training to prevent and reduce stormwater pollution from activities including, but not limited to, park and open space maintenance, fleet and building maintenance, new municipal facility construction and related land disturbances, design and construction of street, water utilities, storm drain systems, and stormwater system maintenance.

In addition, the Phase II rule states that the Phase II small operator must:

- Reduce the discharge of pollutants to the "maximum extent practicable" (MEP);
- Protect water quality; and
- Satisfy the appropriate water quality requirements of the Clean Water Act.

Applicable City of Keizer BMPs

OM-1 Utilize Public Works personnel to review existing O & M plan. Revise the existing plan to address any identified deficiencies. Develop a comprehensive training program.

OM-2 Annually inspect 10% of the City's publically owned infrastructure covered by the NPDES Permit. (TV inspection. Work to be contracted).

OM-3 Develop a training program and schedule for all minimum control measures. Implement developed program.

OM-4 ~~Clean 50% of MS4 catchbasins annually~~

OM-5 Implement augmented street sweeping program annually

Rationale

The City of Keizer selected the five BMPs listed above in order to enhance the existing O & M program and ensure the continuance of the good work established in the first permit period. The BMPs proposed for Pollution Prevention in Municipal Operations will be developed to address the Willamette Basin TMDL as well as the applicable pollutants that apply to Claggett Creek, a 303(d) listed waterway.

During the first permit period the Stormwater Division developed an O &M manual, implemented the practices identified in that manual, and provided internal training for

Public Works personnel. In an effort to ramp up the overall plan during the second permit cycle, Public Works personnel will be utilized to review and update the existing plan. Incorporating ideas and activities by those who routinely use the manual will be useful for personnel as well as the program as a whole. This process will include an evaluation of inspection and recordkeeping activities identified in the manual.

The Stormwater Management Plan (SWMP) developed for the first permit period indicated that Keizer did not have funding or the staff available to complete regularly scheduled maintenance to the storm drainage system. In order to move forward with development of a maintenance program, Stormwater Division staff will develop a long term maintenance program that will include inventory, inspection, and a repair priority schedule for the storm system. A repair schedule with identification of priority work will allow the Public Works Department to annually conduct repair work and financially plan for such activities. The Public Works Department anticipates utilizing a contractor for inspection work. The BMP as written is likely to initiate a CIP program for the stormwater utility.

An emphasis on training has been included throughout the Revised SWMP. Under BMP OM-3, staff will develop a comprehensive training program for applicable City staff. This training program will include all BMPs with specific training needs listed for each minimum control measure.

Catchbasin cleaning has been a successful component of the City of Keizer stormwater maintenance program. ~~With this in mind, the BMP was not originally developed to specifically address MS4 catchbasins. While the City has consistently cleaned well over the 25% annual goal, a portion of those systems cleaned were UIC catchbasins. The revised BMP for cleaning catchbasins through the NPDES permit will be specifically address catchbasins that are connected to infrastructure that outfalls to a waterway.~~ In order to improve this effort and develop trends that identify areas of town where more maintenance and inspection is needed, the City will implement an annual inspect, clean, and repair activity. All City catchbasins will be inspected in late spring. Those structures with 6" or more of accumulated debris will be cleaned. Needed repairs will be noted during the inspection process in order for these activities to be completed at the end of the cleaning cycle. The City feels that this alteration in the original BMP will enhance the cleaning activity by addressing sections of town which need more attention.

The existing street sweeping program will be augmented to include added sweeping to remove excess vegetation during the fall, and in the spring and early summer when construction activities may coincide with wet weather. The augmented sweeping will be completed on local neighborhood roadways that are subject to heavy leaf fall.

BMP OM-1

Utilize Public Works personnel to review existing O & M plan. Revise the existing O & M plan to address any identified deficiencies. Develop a comprehensive training program.

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer developed an O & M manual in 2011 that includes recordkeeping and inspection activities associated with municipal operations. The O & M manual was completed in 2011.

BMP Description and Proposed Activities

Public Works personnel will evaluate and review the O & M manual to identify deficiencies or flaws. This review will include an evaluation of existing recordkeeping and inspection practices.

The revision process will include a prescribed schedule to include annual training and training for new employees.

Measurable Goals

1. Develop a revised O & M manual during PY1
2. Conduct annual refresher training for Public Works personnel

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Revise O & M manual	Implement	Implement	Implement	Implement

BMP OM-2

Annually inspect 10% of the City's publically owned infrastructure covered by the NPDES Permit.

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has inspected UICs, storm drains, and some storm pipe. No video work has been completed for MS4 stormwater pipe. With the exception of UICs, the City of Keizer does not have a comprehensive overview of system condition.

BMP Description and Proposed Activities

This BMP will allow the City of Keizer's stormwater system to be completely inspected and recorded within a 10 year period. The City will utilize a contractor to TV MS4 storm lines. Beginning in PY 2 the City will conduct annual repair work according to the repair schedule. Repair work will be completed on an annual basis

Measurable Goals

1. Annually inspect 10% of the stormwater infrastructure that is covered by the NPDES permit
2. Develop a repair program to include a range of actions from short term repairs to re-inspection of minor defects

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Annually inspect 10% of the City's publically owned infrastructure	Annually inspect 10% of the City's publically owned infrastructure.	Annually inspect 10% of the City's publically owned infrastructure	Annually inspect 10% of the City's publically owned infrastructure	Annually inspect 10% of the City's publically owned infrastructure
	Conduct repairs	Conduct repairs	Conduct repairs	Conduct repairs

BMP OM-3

Develop and implement an annual training program for Public Works personnel

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has had basic training for illicit discharge detection and elimination, construction site runoff and erosion control, good housekeeping in municipal operations, and general stormwater topics. Training has been conducted on a regular basis.

BMP Description and Proposed Activities

The City of Keizer will develop a training program for City staff for all minimum control measures, and associated BMPs listed in the SWMP. Training will be held according to the program and implemented annually

Measurable Goals

1. Develop a training program in PY 1
2. Conduct training according to the program annually

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Develop a training program and associated schedule	Implement	Implement	Implement	Implement

BMP OM-4

Implement a rotation program to include inspection, cleaning, and repair for catchbasins

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has annually conducted catchbasin cleaning throughout the City for the previous permit cycle. While catchbasin cleaning far exceeded the measurable goal of 25% annually, no rationale has been developed for cleaning, recordkeeping activities for MS4 or UIC catchbasins, or repair work.

BMP Description and Proposed Activities

The City of Keizer will continue to clean catchbasins on an annual basis, but a more robust and efficient inspection and cleaning process is being developed. The new program specifies that all public catchbasins are inspected annually. Those catchbasins which require cleaning (6" or more of accumulated material or visual presence of oil and grease) will be cleaned following citywide inspection within the annual cycle. During the inspection process, those structures that require repair will be added to a list for regular repair work.

This rotational program will allow staff to cover more of the City and use time efficiently to clean those catchbasins which truly require maintenance. Staff anticipates this new activity may be modified in subsequent years as information is collected about structures that need regular attention and those that do not.

Measurable Goals

1. Annually inspect all publicly owned catchbasins. Retain inventory totals for annual reporting.
2. Following inspection the City will annually clean all catchbasins that have 6" or more of accumulated material or those structures which have visual evidence of oil and grease. Cleaning totals will be included in the annual report.
3. A repair list will be generated as part of the inspection process. Repairs will be prioritized and added to the rotational schedule for this BMP. Results will be included in the annual report.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Inspect, clean, and repair catchbasins according to schedule	Inspect, clean, and repair catchbasins according to schedule	Inspect, clean, and repair catchbasins according to schedule	Inspect, clean, and repair catchbasins according to schedule	Inspect, clean, and repair catchbasins according to schedule

BMP OM-5

Implement augmented street sweeping program

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

All curbed City streets are swept once per month on a contracted basis. Arterials and collector streets are swept twice per month.

BMP Description and Proposed Activities

All curbed City streets will continue to be swept once per month with arterials and collector streets being swept twice per month. . The accelerated street sweeping program will include 1 additional rotation for 4 months of the year including October, November, December, and April or May, depending on annual precipitation. The additional sweeping will occur on local neighborhood roadways.

Measurable Goals

1. The City of Keizer will track removal amounts on a quarterly basis throughout the permit cycle. These totals will be reported in the annual report.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Street Sweeping	Street Sweeping	Street Sweeping	Street Sweeping	Street Sweeping

Section 6 Additional Measures / BMPs

6. 1 Overview

As was covered in Section 3.4, the Revised SWMP also includes measures intended to make the overall SWMP more robust and work toward the goal of reducing MS4 discharges of pollutants to the maximum extent practicable (MEP). Additional measures were included in the first SWMP for record keeping and reporting, but expansion of this category is warranted in order to increase the efforts of the MS4 stormwater program. This Revised SWMP includes three additional categories, in addition to the original record keeping and reporting, that cover fiscal accountability, elevated enforcement activities, and a preliminary retrofit strategy.

6.2 Budget Analysis (BA)

Applicable City of Keizer BMPs

BA-1 Budget Analysis

Rationale

The City of Keizer selected the BMP listed with this measure in order to ensure that comprehensive planning occurs for the budgeting of the stormwater program. As was covered in Subsection 2.1 of the *Stormwater Management Plan Evaluation*, the City of Keizer stormwater program struggled for several years during the first permit term. The initial stormwater utility fee was insufficient to cover implementation of the NPDES SWMP, the TMDL Implementation Plan, and the pending WPCF permit for the management of UICs.

The Stormwater Division has added this category and associated BMP to provide a routine process to evaluate program funding. An annual fiscal analysis will allow Stormwater staff to keep the program on course, identify deficiencies, and plan for expenditures that may be outside of the norm. The annual fiscal analysis will take into account allocated resources, expenditures, and the staff resources necessary to comply with the permit and implement the SWMP.

BMP BA-1

Provide annual fiscal analysis of the stormwater program to DEQ with the annual report

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer participates in the annual budget preparation process with other Departments and Divisions within the City.

BMP Description and Proposed Activities

The City's strategy for maintaining adequate resources to comply with the MS4 permit will be to provide an annual fiscal analysis of the program to DEQ. This analysis will be submitted with the annual report. The annual fiscal analysis will take into account allocated resources, expenditures, and the staff resources necessary to comply with the permit and implement the SWMP. This analysis will help DEQ to understand the resources that are dedicated to compliance with the permit and complete implementation of the SWMP.

Measurable Goals

1. Provide yearly fiscal analysis to DEQ in annual report

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Annual fiscal analysis	Annual fiscal analysis	Annual fiscal analysis	Annual fiscal analysis	Annual fiscal analysis

6.3 Enforcement Response Plan (ERP)

Applicable City of Keizer BMPs

ERP-1 Develop and implement an Enforcement Response Plan.

ERP-2 Provide annually training for applicable City personnel.

Rationale

The City of Keizer selected the two BMPs listed with this measure in order to ensure that City staff has a consistent plan for responding to violations of stormwater programs.

The Public Works Department staff established an 'educate first' policy during the first permit term. While this process has been effective for an overall educational effort consistent with an initial permit term, over time it becomes confusing to City staff as well as members of the community.

With the first permit term completed, City staff will need a well-developed response plan that will ensure that all residents, businesses, contractors, developers, builders, and the like play by the same rules. A consistent message within the community is essential to the maintenance of a defensible program.

BMP ERP-1

Develop and implement an Enforcement Response Plan

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has adopted ordinances that establish punitive actions for violations of stormwater related City code. No formal plan exists for how violations are assessed.

BMP Description and Proposed Activities

The Stormwater Division will develop an enforcement response plan during permit PY 1. The ERP will set out the potential responses to violations and address repeat and continuing violations through progressively stricter responses as needed to achieve compliance with the intent of the permit. The ERP will describe how the City of Keizer will use an accelerated approach including verbal warnings, written notices of violation, citations (with fines), stop work orders, or additional measures approved under legal authority.

Measurable Goals

1. Develop the Enforcement Response Plan
2. Annually track enforcement actions to be included in the annual report

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Develop an Enforcement Response Plan	Implement plan	Implement plan	Implement plan	Implement plan

BMP ERP-2

Provide annually training for applicable City personnel

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has adopted ordinances that establish punitive actions for violations of stormwater related City code. No formal plan exists for how violations are assessed.

BMP Description and Proposed Activities

The development of the Enforcement Response Plan will include review by Public Works personnel. A training schedule will be developed for applicable City personnel.

Measurable Goals

1. Document training activities

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
	Implement training	Implement training	Implement training	Implement training

6.4 Stormwater Retrofit Program (SR)

Applicable City of Keizer BMPs

SR-1 Develop a project schedule and strategy for initial retrofit program

SR-2 Develop maintenance and inspection plan

SR-3 Complete identified projects annually based on project schedule

SR-4 Develop downspout disconnection program

Rationale

The City of Keizer selected the four BMPs listed with this measure in response to the need for feasible stormwater quality retrofits within the community. The intent of the stormwater retrofit program is to develop an initial program that can be expanded over time to include different portions of the City, land uses, and treatment types.

The City of Keizer has already started the process of implementing innovative design practices for some areas within the City. See Subsection 5.5, page 39, for a discussion on the ODOT roadside bioswales planned for construction on Chemawa Rd N. While the City has taken preliminary steps for stormwater design alternatives, no formal retrofit program has been created. Under the proposed category, Stormwater Division staff will develop a strategy for an initial retrofit program. As was stated above, this program is intended to be developed in increasing detail over time. Development of above ground natural features will be emphasized through this program, and staff will look at existing features which can be easily modified to provide collection and treatment capabilities.

As bioswales, raingardens, flow-through planters and the like are constructed within the City, maintenance staff will need a comprehensive maintenance and inspection manual for new facilities. This task will be developed under BMP SR-2.

With the new retrofit project schedule and maintenance plan developed, the City will complete identified projects as outlined in the retrofit strategy. Projects will be completed according to the developed schedule on an annual basis. Establishment of these facilities within the community will go a long way toward helping residents adapt to new water quality design features. This is particularly important within Keizer as the community looks to a substantial UGB expansion in the near future. Our neighborhoods of the future will have a much different look than those that were recently designed with a predominance of impervious surface features.

The final BMP for the retrofit program is a downspout disconnection program. In order to keep the program manageable, the City hopes to develop a grant type program. This format will permit the Public Works Department to budget on an annual basis for implementation. Applications from interested participants will allow staff to evaluate interest within the community. Participants will have the ability to apply for items such as a rain barrel, rain garden installation assistance, or plants for the rain garden. The City does not currently have a stormwater credit or incentive program.

BMP SR-1

Develop a project schedule and strategy for a preliminary retrofit program

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer has taken the opportunity to implement several creative stormwater designs within the community. However, no formal retrofit program has been developed. No specific area has been evaluated for retrofit need or feasibility.

BMP Description and Proposed Activities

This BMP will include the development of a preliminary retrofit program for the City of Keizer. A project plan will be developed which will include a project and implementation schedule. The program is being developed to start small and expand from permit term to permit term. As such, staff will look toward retrofits for existing features within the community which can be easily modified to provide collection and treatment capabilities.

Measurable Goals

1. Develop the project plan to include a project schedule and implementation schedule in PY 1

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Develop a project plan and implementation strategy	Implement plan	Implement plan	Implement plan	Implement plan

BMP SR-2

Develop maintenance and inspection plan

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City of Keizer does not have a maintenance and inspection plan for bioswales, water quality features, roadside swales, or other vegetated stormwater facilities. Maintenance is restricted to irrigation and replanting activities.

BMP Description and Proposed Activities

The Stormwater Division will develop a maintenance and inspection plan for the retrofits associated with the project strategy plan. The guide will be suitable for future projects within the City that involve utilization of natural systems for stormwater infiltration and treatment.

Measurable Goals

1. Develop inspection plan in PY 2 2

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
	Develop maintenance and inspection plan			

BMP SR-3

Complete Projects Annually Based on Project Schedule

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

The City has no formal plan for retrofit installation within the City. The City of Keizer has taken the opportunity to implement severa creative stormwater designs within the community; however, no formal retrofit program has been developed.

BMP Description and Proposed Activities

The City of Keizer will complete projects identified in the preliminary retrofit program according to the Department approved project schedule. Activities will commence in PY 2 and be completed according to schedule on an annual basis.

Measurable Goals

1. Document projects, installation activities, and maintenance activities
2. Provide findings in the annual report

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
	Complete identified projects	Complete identified projects	Complete identified projects	Complete identified projects

BMP SR-4

Develop a Downspout Disconnection Program

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

Currently, the City of Keizer does not offer stormwater credits or incentive programs directed toward volume or flow reduction.

BMP Description and Proposed Activities

In PY 3 the Stormwater Division will develop a voluntary downspout disconnection program. The program will be incentive based and designed to educate the community about water quality. This program will be developed as a grant style opportunity that will allow residents to apply for items such as rain barrels, rain garden construction assistance, or rain garden plants and soil amendments.

Measurable Goals

1. Develop the program in PY 3.
2. Track number of participants annually.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
		Develop a downspout disconnection program	Implement program	Implement program

6.5 Record Keeping and Reporting

Applicable City of Keizer BMPs

RR-1 Develop an electronic stormwater database to track SWMP program elements including repair and maintenance activity

RR-2 Maintain spatial information for private stormwater infrastructure. Add spatial information for SWMP program elements

Rationale

The City of Keizer selected the two BMPs above in order to ensure that detailed information on SWMP elements and the stormwater infrastructure is tracked and reportable. The City of Keizer does not have a GIS Department, and currently all creation and management of stormwater data must be maintained by existing staff.

The City has spent the last few years mapping public stormwater assets in ArcMap, but there is room to grow. Private stormwater systems, stormwater treatment and filter facilities, and incident response locations have not so far been tracked spatially. Also, the City tracks some information on SWMP program elements and work done to the stormwater system, but there is no central database to house the information in one location. These BMPs would expand the information and programs tracked spatially in ArcMap, and would create an electronic database which could store and retrieve tracked program and asset history information.

BMP RR-1

Develop an electronic stormwater database to track SWMP program elements including repair and maintenance activity

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

Currently BMP and stormwater accomplishments are tracked in a variety of places. Key information is not readily available when needed. Information regarding inspections, cleaning and repair work has not been systematically tracked due to a lack of unique identification numbers for each asset. Stormwater staff has recently assigned unique ID numbers to each asset.

BMP Description and Proposed Activities

The Stormwater Division will develop an electronic stormwater database to house and track stormwater asset data. The data base will use the asset ID number to correlate with information on specific work done to each asset (inspection, cleaning, repairs). The database will provide a single location to track accomplishments for numeric-based BMPs and SWMP elements.

Measurable Goals

1. Develop the electronic stormwater database framework in PY 1
2. Annually update database

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Develop an electronic stormwater database framework	Update Annually	Update Annually	Update Annually	Update Annually

BMP RR-2

Maintain spatial information for private stormwater infrastructure. Add spatial information for SWMP program elements.

Responsible Parties

Department of Public Works, Stormwater Division

Existing Conditions

In the past two years, staff has successfully mapped the majority of publically-owned stormwater assets. Currently, there are over 8000 stormwater assets housed in ArcMap shapefiles. In addition, all mapped elements have been assigned unique identification numbers to correlate asset information with specific map locations. However, most of the private stormwater systems, and many treatment facilities (swales, etc) have not yet been mapped.

BMP Description and Proposed Activities

The Stormwater Division will continue to grow the body of spatial information being housed in ArcMap to include private stormwater assets as they are inventoried (see BMP ID-5), and SWMP programs with a spatial component such as IDDE high risk areas, spill response locations and the like. Adding this spatial information will begin in PY1 and continue throughout the permit term.

Measurable Goals

1. Add spatial information on private stormwater system and relevant SWMP elements starting in PY 2
2. Update annually.

Implementation Schedule

Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
	Maintain spatial information on private stormwater infrastructure. Add SWMP program elements	Update Annually	Update Annually	Update Annually

Appendix B - Revised SWMP Implementation Schedule

BMP	Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5
Mcm#1 Public Education and Outreach (PE)					
PE-1	Utilize advisory committee to develop a the Public Education program	Implement Activities	Implement Activities	Implement Activities	Implement Activities
PE-2				Assess changes in public awareness through survey or other statistical method	
PE-3	Utilize the annual CCR to distribute stormwater educational material				
PE-4	Redesign stormwater website	Update website	Update website	Update website	Update website
PE-5	Provide annual technical support to the Claggett Creek Watershed Council	Provide annual technical support to the Claggett Creek Watershed Council	Provide annual technical support to the Claggett Creek Watershed Council	Provide annual technical support to the Claggett Creek Watershed Council	Provide annual technical support to the Claggett Creek Watershed Council
Mcm #2 Public Involvement and Participation (PI)					
PI-1	Develop program evaluation methodology	Utilize a new or existing advisory committee for annual review of the stormwater program and to apply adaptive management strategies			
PI-2	Install 125 - 150 storm drain markers	Install 125 – 150 storm drain markers	Install 125 - 150 storm drain markers	Install 125 - 150 storm drain markers	Install 125 - 150 storm drain markers
PI-3	Utilize community groups and/or volunteers to maintain restoration sites	Utilize community groups and/or volunteers to maintain restoration sites	Utilize community groups and/or volunteers to maintain restoration sites	Utilize community groups and/or volunteers to maintain restoration sites	Utilize community groups and/or volunteers to maintain restoration sites

Mcm #3 Illicit Discharge Detection and Elimination (ID)					
ID-1	Revise IDDE Plan to include a process to proactively seek out illicit discharges and connections. Include dry weather inspection schedule				
ID-2	Develop criteria for high risk areas	Update annually	Update annually	Update annually	Update annually
ID-3		Link to GIS	Update annually	Update annually	Update annually
ID-4		Develop an inspection and inventory plan for privately owned stormwater facilities connected to MS4 infrastructure. Notification of property owners	Inventory and Inspection	Complete Inventory. Link information to ArcMap.	
ID-5				Analyze data and prepare management strategy	Implement strategy
Mcm #4 Construction Site Runoff (CS)					
CS-1	Conduct internal EPSC training for applicable City staff Obtain specialized training for construction site inspectors	Refresher training	Refresher training	Refresher training	Refresher training
CS-2		Develop and maintain an inventory of all active public and private construction sites that require a CSPPP			

CS-3			Revise existing Construction Site Pollution Prevention Plan (CSPPP) and ordinance to require low impact development elements		
			Develop a separate hotline for erosion control complaints	Operate hotline	Operate hotline
Mcm #5 Post Construction / Development Standards (DS)					
DS-1	Revise existing design standards and development code to reflect flow reduction, limit impervious area, and retention of a minimum storm volume	Complete revision work			
DS-2			Implement the revised water quality standards for new and re-development and conduct plan reviews, inspections, and enforcement activities.	Implement	Implement
DS-3			Conduct annual training for applicable City personnel	Refresher Training	Refresher Training
Mcm #6 Pollution Prevention in Operations and Maintenance (OM)					
OM-1	Utilize Public Works personnel to review existing and revise existing O and M plan to identify deficiencies. Accelerate training				

OM-2	Annually inspect 10% of the City's publically owned infrastructure. Develop a repair schedule and initiate high priority repairs	10% inspection Conduct repairs	10% inspection Conduct repairs	10% inspection Conduct repairs	10% inspection Conduct repairs
OM-3	Develop an annual schedule to meet the training BMPs listed in the SWMP	Implement training schedule	Implement training schedule	Implement training schedule	Implement training schedule
OM-4	Clean 50% of MS4 catchbasins annually				
OM-5	Implement augmented street sweeping program annually				
Budget Analysis (BA)					
BA-1	Provide an annual fiscal analysis of the stormwater program to DEQ with the Annual Report				
Enforcement Response Plan					
ERP-1	Develop an Enforcement Response Plan	Implement Enforcement Response Plan	Implement Enforcement Response Plan	Implement Enforcement Response Plan	Implement Enforcement Response Plan
ERP-2		Provide internal training for applicable City staff	Refresher training	Refresher training	Refresher training
Stormwater Retrofit Program (SR)					
SR-1	Develop a project schedule and strategy for preliminary retrofit program				
SR-2		Develop maintenance and inspection plan	Implement inspection and maintenance plan for completed projects	Implement inspection and maintenance plan for completed projects	Implement inspection and maintenance plan for completed projects

SR-3		Complete identified projects annually based on project schedule	Complete identified projects annually based on project schedule	Complete identified projects annually based on project schedule	Complete identified projects annually based on project schedule
SR-4			Develop a downspout disconnection program	Implement program	Implement program
Record Keeping and Reporting (RR)					
RR-1	Develop an electronic database to track SWMP program elements and repair and maintenance activity	Update annually			
RR-2		Maintain spatial information for private stormwater infrastructure. Add SWMP program elements	Update annually		

APPENDIX B

Revised Second TMDL Implementation Plan Matrix

Pollutant: Bacteria ***(Six Minimum Control Measures Listed at the End of Each Table)***

BMP *Shaded BMPs are included in the SWMP*	**Source** *What source of this pollutant is being addressed?*	**Strategy** *What is being done, or what will be done to reduce or control pollution from the source?*	**How** *Specifically, how will this be done?*	**Fiscal Analysis**	**Measure** *How will successful implementation or completion of this strategy be measured?*	**Timeline** *When will the strategy be completed?*	**Milestone** *What intermediate goals will be achieved and by when to know what progress is being made?*	**Status** ***For the purpose of the draft Second Matrix, the 'Status' column provides clarification for each BMP. Once approved by DEQ, the Status column will be used for yearly progress details.***
PE	1. Bacteria carried to waterways in storm runoff and piped system	a. Prevent domestic animal waste from reaching waterway	i. Stormwater booth at Public Works Week open house or Public Service Fair	Shared funding with MWOG agencies. Promotional items	Utilize CCC to document willingness to adopt new behavior	Annually	Track pledges and event participants	**Continuing** ***This BMP has been retained, but adjusted to meet new conditions. KP3 has been changed from a local program to a regional program***
PE			ii. Expand 'doggie' bag program in local parks and high pedestrian areas	Unknown. The first project will be fully funded by the Eagle Scout	Installation of new stations and monitor bags	Annually	Working with scout troops to design new bag stations	**Continuing** ***The new stations are maintained by users in the 'take one, and bring some to share the next time' fashion. They will be brightly painted and will be marked with the City of Salem 'Clean Streams, Clear Choices' brand. This BMP has been revised.***
PE			iii. Promote Capital Canine Club for Clean Streams (CCC)	Staff time. Shared funding for promotional items	Track pledges and continue to expand program. Number of attendees.	Annually	Participate in 1 regional event per year (such as Howl-a-Palooza)	**Added** ***New BMP. CCC is a regional program developed through the MWOG agencies.***
			~~iv. Identify 'hobby farms' within the UGB. Partner for ongoing restoration activity~~					**Removed** ***This BMP has been removed. The Marion Soil and Water Conservation District provide outreach to hobby farmers. The following BMP has been added as a replacement.***
PE			iv. Develop pet waste study for Keizer to use for outreach	Staff time	Track annual progress and information gathered	2016	Planning efforts to commence in 2013	**Added** ***A pet waste study can be added to the suite of other pet waste outreach activities that will be one piece of a comprehensive program.***
PE			v. Continue guided hikes by Stormwater staff to highlight environmental issues of concern along waterways.	Funded	Track number of participants, school groups, and events	Annually	Work with local teachers and partner with other agencies for participation.	**Continuing** ***No major changes are planned for this BMP.***

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			~~vi. Prepare a resource list for the public. Stormwater links to include local, educational, and regulatory resources~~					**Removed** ***The Stormwater Section has a resource list on the website. It will continue to be updated as part of website updates***
PE			vi. Utilize City of Salem branding logo for outreach efforts	Funded	Track materials and events	Annually	Use on outreach material in 2013/2014	**Added** ***City of Salem has developed a brand and logo, Clean Streams, Clear Choices. Keizer will utilize the brand on outreach material to continue a regional emphasis***
PE-4			vii. Add stormwater-related information to the City's Website	Funded	Track information added or updated	Annually	Review annual updates	**Continuing** ***This is a BMP in the NPDES SWMP***
PE		b. Public outreach covering bacteria issues and concerns	viii. Develop traveling display to be used in public settings	Staff time	Track locations and presentation material	Ongoing	Develop display material based on event and location	**Continuing** ***No major changes are planned for this BMP.***
PI-2			i. Storm drain markers	Funded	Number of markers installed	Annually	100 markers installed annually	**Continuing** ***This is a BMP in the NPDES SWMP***
PI			ii. Public Review of TMDL Implementation Plan	Staff time	Document events	Annually	Guided hike at Keizer Rapids Park with the SWAC in 2013	**Continuing** ***Staff hopes to utilize more creative ways to review the TMDL Implementation Plan***
ID-4		b. Prevent human waste (from cross-connections), oil, grease, paint, and other pollutants from entering the storm system.	i. Inspect private facilities to determine condition	Funded	Track annual activities such as notification, inventory, and inspection	2016	Staff will provide notification and program overview to the public in 2014	**Continuing** ***This is a BMP in the NPDES SWMP. Inspection and inventory of private facilities will allow the City to identify problem areas with a potential for illicit discharges to the MS4.***
ID-1			ii. Revise illicit discharges detection and elimination plan	Staff time	Track annual activity	2014/2015	Utilize maintenance personnel to assist with rewrite	**Added** ***The IDDE Plan was developed in 2008. Some practices have been adopted, but it needs to be revised to reflect existing conditions. This is a BMP in the NPDES SWMP***
ID			iii. Internal training for implementation of the new plan	Staff time	Track training	2014/2015	Utilize maintenance personnel to take a lead role in training	**Added** ***While training is a BMP in the NPDES SWMP, this training will be for the revised IDDE plan and maintenance staff will play a lead role in personnel training.***
ID			iv. Implement the new plan	Staff time	Enforcement actions	Ongoing	Document progress in annual report	**Added** ***Implement the revised plan. This is a BMP in the NPDES SWMP***

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			v. Annual TV inspection of the MS4	Funded	Track annual footage and identify illegal connections and repairs	Annually	10% of MS4 system per year	**Added** ***Annual TV inspection of the MS4 has been approved as a BMP in the City's Revised SWMP for the NPDES permit. DEQ has approved this BMP for the revised NPDES SWMP***
ERP-1			vi. Develop Enforcement Response Plan	Staff time	Track implementation statistics	Annually	Draft document in 2014	**Added** ***City staff has been inconsistent with enforcement action with the exception of erosion control actions. An enforcement response plan will provide clear guidance to staff for the expected action for violations of City ordinances. DEQ has indicated this would be a useful tool and it is included in the NPDES SWMP***

Six Minimum Control Measures
PE = Public Education
PI = Public Involvement/Participation
ID = Illicit Discharge Detection and Elimination (IDDE)
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DS = Development Standards (Post-Construction Runoff Control)
OM = Operations and Maintenance (Pollution Prevention/Good Housekeeping)

APPENDIX B

City of Keizer
TMDL Implementation Plan Matrix
Proposed Revised Matrix

Pollutant: Mercury ***(Six Minimum Control Measures Listed at the End of Each Table)***

BMP *Shaded BMPs are included in the SWMP*	**Source** *What source of this pollutant is being addressed?*	**Strategy** *What is being done, or what will be done to reduce or control pollution from the source?*	**How** *Specifically, how will this be done?*	**Fiscal Analysis**	**Measure** *How will successful implementation or completion of this strategy be measured?*	**Timeline** *When will the strategy be completed?*	**Milestone** *What intermediate goals will be achieved and by when to know what progress is being made?*	**Status**
		a. Public outreach covering mercury issues and concerns	~~i. Prepare a resource list for the public. Stormwater links to include local, educational, and regulatory resources~~					**Removed** ***The Stormwater Section has a resource list on the website.***
PE-4			i. Add stormwater-related information to the City's Website	Funded	Track information added or updated	Annually	Review annual updates	**Continuing** ***This is a BMP in the NPDES SWMP***
			~~ii. Develop traveling display to be used in public settings~~					**Replaced** ***This BMP was replaced for mercury. Outreach occurs in a number of other ways. The public outreach events are more suited to education involving bacteria. However, staff will take advantage of the board for other outreach opportunities that arise.***
PE			ii. Utilize City of Salem branding logo for outreach efforts 'Clear Choices, Clean Streams'	Funded	Track materials and events	Annually	Use on outreach material in 2013/2014	**Added** ***City of Salem has developed a brand and logo, Clean Streams, Clear Choices. Keizer will utilize the brand on outreach material to continue a regional emphasis***
			~~iii. Prepare educational material for contractors and builders. Develop a 'small project' erosion control plan for additions to developed property such as driveway replacement, patios, home expansion, etc.~~					**Replaced** ***This BMP has been replaced. The MWOG group is creating regional messages and hosting annual training. See the Erosion Control Summit***

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PE			iii. Erosion Control Summit	Funded	Track attendees and information presented	Annually	Program developed for January 15, 2013	**Added** ***The City is in the process of planning for the 2nd event to be held in January 2013. The 1st event held in February 2012 was very successful. This is a regional activity.***
			~~iv. Coordination internally for development and educational opportunities at Keizer Rapids Park~~.					**Removed** ***When the TMDL Implementation Plan was written it appeared that this park was going to be developed to highlight the natural elements of the area. The City of Keizer has put more emphasis on recreational uses and the environmental amenities are somewhat reduced due to installation of the boat ramp, an amphitheater, the disc golf course, and volleyball courts. Staff will continue to utilize the conservation easement and the river itself for guided hikes, but the BMP is being removed.***
PE-3			iv. Utilize the annual Consumer Confidence Report (CCR) to provide citywide outreach	Funded	Track content	Annually	Mailings scheduled for April/May on an annual basis.	**Continuing** ***The CCR is a BMP in the NPDES SWMP***
PI-2		a. Public involvement	i. Storm drain markers	Funded	Number of markers installed	Ongoing	Track annual activity starting in 2013	**Continuing** ***This is a BMP in the NPDES SWMP***
CS-3		b. Keep soil on site. Prevent material from entering catchbasins and waterways	i. Revise the existing erosion control ordinance	Staff time	City Council adoption of amendments	2013/2014	Begin work with City Legal Counsel in 2013	**Added** ***This is a BMP in the NPDES SWMP***
CS			ii. Internal training for field staff	Staff time	Record of meeting and content	Ongoing	Training schedule to be developed by staff	**Continuing** ***This BMP was not included as an Added activity because it was incomplete from the 1st review period***
CS			iii. Plan review, inspections, and enforcement	Staff time	Track staff progress	Ongoing	Develop enforcement response for the program	**Continuing** ***This BMP was not included as an Added activity because it was incomplete from the 1st review period***
CS-4			iv. Establish hotline to receive complaints from the public	Funded	Develop tracking system	2014	Develop procedure for checking calls and responding	**Continuing** ***This BMP was not included as an Added activity because it was incomplete from the 1st review period***
DS-1			v. Revise Design Standards and Development Code	Staff time	City Council adoption of revised documents	2016	Staff anticipates utilizing SWAC for review of this activity	**Added** ***This is a BMP in the NPDES SWMP***
DS-3			vi. Internal training for new development standards	Staff time	Completion of training	2016	Develop training schedule	**Added** ***This is a BMP in the NPDES SWMP***
DS-2			vii. Plan review, inspections, enforcement	Staff time.	Track staff progress	Ongoing	Plan review to be completed when revisions are complete	**Added** ***This is a BMP in the NPDES SWMP***

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OM-1			viii. Revise the Good Housekeeping Manual	Staff time		2015	Utilize maintenance personnel for this activity	**Added** ***This is a BMP in the NPDES SWMP***
OM			ix. Internal training for new O & M practices	Staff time	Agenda and instruction content	Ongoing	Assist maintenance personnel with flushing plan	**Added** ***This is a BMP in the NPDES SWMP***
OM-4 REVISED			x. Catchbasin cleaning	Funded	~~Track number of catchbasins cleaned~~	Ongoing	~~50% of City catchbasins cleaned annually~~. Annual inspect all catchbasins and clean those with 6" or more of debris.	**Continuing** ~~***Measureable goal expanded. This is a BMP in the NPDES SWMP***~~ ***This BMP was amended to an inspect, clean, repair program. Annual inspection of all catchbasins occurs on an annual basis. See Revised NPDES SWMP***
OM-5 REVISED			xi. Conduct street sweeping	Funded	Track progress	Ongoing	Sweeping on a monthly basis. This program is currently underway.	**Continuing** ***This is a BMP in the NPDES SWMP*** ***Include new contract language that includes implementation of BMPs for operation of equipment and spill identification***
ERP-1			vi. Develop Enforcement Response Plan	Staff time	Track implementation statistics	Annually	Draft document in 2014	**Added** ***An enforcement response plan will provide clear guidance to staff for the expected action for violations of City ordinances. DEQ has indicated this would be a useful tool and it is included in the NPDES SWMP***

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APPENDIX B

City of Keizer
TMDL Implementation Plan Matrix
Proposed Revised Matrix

Pollutant: Temperature ***(Six Minimum Control Measures Listed at the End of Each Table)***

BMP *Shaded BMPs are included in the SWMP*	**Source** *What source of this pollutant is being addressed?*	**Strategy** *What is being done, or what will be done to reduce or control pollution from the source?*	**How** *Specifically, how will this be done?*	**Fiscal Analysis**	**Measure** *How will successful implementation or completion of this strategy be measured?*	**Timeline** *When will the strategy be completed?*	**Milestone** *What intermediate goals will be achieved and by when to know what progress is being made?*	**Status**
PE-3	1. Solar radiation and sediment deposition that results in a change in stream profile.	a. Retain mature trees, native vegetation, and encourage tree planting and use of native species for bank stabilization	i. Utilize the annual Consumer Confidence Report (CCR) to provide citywide outreach	Funded	Track content	Annually	Mailings scheduled for April/May on an annual basis.	**Continuing** ***This is a BMP in the NPDES SWMP***
PE			ii. Design a stormwater brochure to be handed out at meetings and events Revise annually	Funded	Track useage and events. Revise annually	Annually	Brochure completed by March of each year.	**Continuing** ***This BMP has been useful for providing information for various events, and educational opportunities***
			~~iii. Identify 5 project sites along Claggett Creek for native tree and shrub planting~~					**Removed** ***This BMP has been removed. Staff has identified restoration sites***
PE			iii. Develop new restoration projects in the upper reach of Claggett Creek to connect existing sites	Staff time. Materials and equipment	Annual progress	2015	Draft plan developed by 2013	**Continuing** ***This portion of Claggett Creek currently includes 4 restoration sites within close relatively close proximity. The goal of this BMP will be to connect the existing sites with new projects which will result in a corridor of properly functioning riparian area.***
PE			iv. Develop a tree preservation ordinance.	Staff time	Document annual progress	2016	Draft plan by 2014	**Added** ***This BMP has been added to help address temperature issues***
PE		b. Public outreach covering temperature issues and concerns	i. Guided hikes at Keizer Rapids Park.	Staff time	Track events and participation	Annually	At least 1 event in 2013	**Added** ***This BMP was added to 'temperature' Staff will add temperature components into the presentation material.***

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PE-4			iii. Interpretive signage in parks along waterways and in stormwater infiltration facilities	Staff time / design & construction funded	Number of signs installed and locations	2016	Storm staff will install 2 signs at Keizer Rapids Park in 2013	**Continuing** ***Staff has obtained the software to design interpretive signage in-house.***
			~~Utilize local Channel 23 to provide stormwater education~~					**Replaced** ***This BMP has been replaced with the following BMP. Channel 23 was ineffective during the 1st review period.***
PE-4			iv. Use website to provide stormwater education	Staff time	Track information and content	Ongoing		**Added** ***This BMP was added to replace the BMP listed above***
PE-5			v. Participate in Claggett Creek Watershed Council meetings and projects	Staff time	Meetings attended and partner projects	Ongoing	Continue to assist with recruitment of members	**Continuing** ***This is a BMP in the NPDES SWMP***
			~~v. Tighten existing City code to emphasize retention of 'native' vegetation Explore existing code for addition changes that are not time intensive~~					**Replaced** ***This BMP has been replaced. Retention of vegetation is required in the Erosion Control ordinance and the City's Discharge Ordinance. A tree preservation ordinance is planned for the second 4 year period.***
			vi. ~~Internal education for field staff directed towards retention of trees along waterways and temperature issues~~					**Replaced** ***No real progress occurred for this BMP over the 1st review period. Development of a tree preservation ordinance will allow the retention of trees. Internal education will be a result of the new ordinance***
PI-3			v. Utilize volunteer groups for restoration work and maintenance	Staff time	Track events and activities	Annually	At least 1 event per year	**Added** ***This is a BMP in the NPDES SWMP***
CS-3		b. Keep soil on site. Prevent material from entering waterways	i. Revise exiting erosion control ordinance.	Staff time	City Council adoption of amendments	2013	Draft language completed by early 2013	**Added** ***The original erosion control ordinance was adopted by City Council in May 2011***
DS-1			ii. Revise Design Standards and Development Code to address Post-Construction requirements	Staff time. Public notice is funded	City Council adoption of revised documents	2016	Staff anticipates utilizing SWAC for review of this activity	**Added** ***This is a BMP in the NPDES SWMP***

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ERP-1			iii. Develop Enforcement Response Plan	Staff time	Track implementation statistics	Annually	Draft document in 2014	**Added** ***City staff has been inconsistent with enforcement action with the exception of erosion control actions. An enforcement response plan will provide clear guidance to staff for the expected action for violations of City ordinances. DEQ has indicated this would be a useful tool and it is included in the NPDES SWMP***

Six Minimum Control Measures

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City of Keizer

Systemwide Assessment

August 2013

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Section 1 – Executive Summary

1.1 Systemwide Assessment Purpose

The purpose of the Systemwide Assessment is to consider a varied group of physical, spatial and relational assessment factors which will guide management of the system over time. The Systemwide Assessment factors will be re-analyzed after five years (mid-permit cycle), in order to keep the UIC system management plan up to date.

The DEQ requires that a Systemwide Assessment be done as part of the City of Keizer's Water Pollution Control Facility (WPCF) permit. The Systemwide Assessment considers all permittee owned or operated UIC systems in light of the assessment factors laid out in the WPCF permit, which are designed to identify situations which could adversely affect water quality.

The permit required factors for assessing all permittee owned or operated UICs are summarized as follows:

- Updated Inventory of all permittee owned or operated UICs, including latitude and longitude
- Estimated vehicle trips per day for the areas drained by each permittee owned or operated UIC
- Inventory of all permittee owned or operated UICs which discharge directly into groundwater
- Inventory of all permittee owned or operated UICs which do not meet horizontal setback distances for water wells
- Inventory of any permittee owned or operated UICs prohibited by OAR 340-044-0015(d), including UICs installed in vehicle maintenance areas, floor drains, fuel dispensing areas, permittee owned or operated fire station floor drains or maintenance facilities
- Inventory of all industrial and commercial properties that pose a risk of pollutant discharge to permittee owned or operated UICs

For each assessment factor, City staff analyzed existing data sources to determine the number of UICs/taxlots in each category, identified data gaps which need to be addressed in future, and any follow up actions, including any need for additional analysis.

1.2 Summary of Findings

The table below summarizes the list of findings for the Keizer UIC system, by assessment factor. Detailed data for each UIC by assessment factor may be found in Attachment A: Systemwide Assessment Data.

Assessment Factor	Findings by Factor
City UIC Inventory	86 UICs owned or operated by Keizer
City UICs receiving drainage from roads having >1000 vehicle trips per day	25 UICs (4 local streets, 21 collector or arterial)

Assessment Factor	Findings by Factor
City UICs which directly discharge to groundwater	1 UIC (planned for closure)
City UICs which do not meet current DEQ well setbacks (500 feet or 2 Year Time of Travel)	58 UICs are within 500 feet of a taxlot containing a water well; 1 UIC is outside 500 feet but still within a delineated 2-Year Time of Travel
City UICs in prohibited areas such as fueling or vehicle maintenance areas, floor drains, etc.	None
Industrial, Commercial or SARA/hazmat properties which may pose a risk of pollutant discharge to City UICs	13 UICs potentially receive drainage from: - 9 SARA properties - 21 Industrial properties - 41 Commercial properties

Section 2 – Overview

2.1 Keizer Drinking Water Source – Deep Confined Aquifers

Groundwater is the sole source of public drinking water in the City of Keizer. The City owns and operates 16 public drinking water supply wells. All of the wells derive water from the Troutdale aquifer, a productive and historically protected aquifer generally comprised of sand and gravel.

All of the City wells draw water from a depth at or below 100 feet, with the majority of the wells obtaining water from depths of 120-300 feet. A semi-confining clay layer underlies most of the City at a depth of 60-100 feet. Since 2001, the City has been improving the wells by sealing them into this clay layer with steel well casings and cement grout to protect water quality. As of July 2013, all but one well (#11) has been sealed from interaction with shallow groundwater. Well #11 is only used periodically and is the City's oldest drinking water well. It is planned for abandonment in 2014. Water drawn from this well is tested and confirmed within safe drinking water limits before use.

Keizer also has many private water wells, both for drinking water and for irrigation (223 private water wells at the time of this assessment). These wells have been mapped from well logs recorded with the Oregon Water Resources Department. Well logs are often unclear and/or incomplete, such that exact well locations may not be determinable except to the tax lot boundary associated with the well. For this reason, Keizer chose to re-do the assessment of the number of UICs with wells within 500 feet, by more conservatively drawing a 500 foot buffer around the entire tax lot containing a well record. See Section 6: Horizontal Setbacks, for more information.

2.2 Keizer UIC System

The City of Keizer currently owns/operates 86 UICs within the city limits. The UIC infrastructure includes approximately 512 UIC catchbasins, 14 drywells (perforated or bottomless manholes) and over 32,000 feet of horizontal perforated pipe. Most of the UICs are configured as an area network of catchbasins and manholes connected by horizontal perforated pipe. Of the 86 UICs, 20 are connected to the MS4 system (sometimes with an overflow or weir).

The City has a delineated overall drainage area for each UIC, as well as effective impervious within that area. City UICs encompass a total drainage area of 328.4 acres, although the effectively impervious area is only 186 acres. The majority of UIC drainage comes from residential, and to a lesser extent, commercial taxlots. There are 3 UICs in industrially zoned areas. Please refer to Section 3: UIC Inventory for further details. For location data of all current City UICs, refer to Attachment A: Systemwide Assessment Data.

2.3 Keizer Groundwater Protectiveness Model

The City of Keizer contracted GSI Water Solutions in July 2012 to create and run a Groundwater Protectiveness Model. The model utilizes Keizer-specific inputs to determine the vertical and horizontal UIC setbacks that are protective of groundwater. The model is designed to be highly conservative in nature, using the most mobile stormwater pollutants and the most conservative assumptions to run.

The model, when run, will define the protective horizontal distance for Keizer UICs called a Waste Management Area (WMA). Any UICs which do not have water wells within this boundary will be

considered protective of water wells. Once the WMA distance for Keizer has been determined, Keizer will propose that it replace the generic 500 foot horizontal setback currently used in the permit language.

The Groundwater Protectiveness Model will provide other information such as protective depth/distance from groundwater, and pollutant-specific protective distances and setbacks. These elements of the model do not affect the Systemwide Assessment directly, but are discussed in more detail in the Section 6 – Horizontal Setbacks.

2.4 Systemwide Assessment Approach

The Systemwide Assessment is required in Schedule B (1) of the WPCF permit, which specifies the elements that must be addressed for all injection systems owned or operated by the City. The assessment factors listed in the WPCF permit are as follows:

> ***a.*** *An updated inventory of all injection systems that receive stormwater or other fluids and their locations by latitude and longitude in decimal degrees using the NAD 83 datum. If a different datum becomes the standard during the permit term, update the underground injection system inventory using the new datum at the five year review;*
> ***b.*** *An updated estimate of vehicle trips per day for the area(s) drained by the injection systems;*
> ***c.*** *An updated inventory of all injection systems that discharge directly into groundwater;*
> ***d.*** *An updated inventory of all injection systems that do not meet the setback distances listed in Schedule A;*
> ***e.*** *An updated inventory of all injection systems that are prohibited by OAR 340-044-0015(2), which includes injection systems in vehicle maintenance areas, fuel dispensing areas, floor pits, non-vehicle maintenance facilities' floor drains, and fire station bay floor drain. For these prohibited systems, you also must report and take corrective actions as described in Schedule D, conditions 4 and 5;*
> ***f.*** *An updated inventory of all industrial facilities and commercial properties that pose a risk of pollutant discharge to injection systems that you own or operate.*

Furthermore, Schedule D (5) states that the permittee must implement the DEQ approved management plan, which includes the Systemwide Assessment, and approved updates. The Systemwide Assessment must be revised (if any changes to the system have occurred) in the 5th year of the permit term.

The Systemwide Assessment is laid out with a Section for each of the assessment factors, as follows:

Section 2: Overview

Section 3: UIC Inventory

Section 4: Vehicle Trips per Day

Section 5: Direct Discharge to Groundwater

Section 6: Horizontal Setbacks

Section 7: Prohibited UICs

Section 8: Industrial or Commercial at Risk of Discharging Pollutants

Each section includes a discussion of the assessment factor; a description of the data sources used for the analysis; findings of the analysis, and; any follow-up actions as a result of the analysis, including any needs for further analysis.

Section 3 – UIC Inventory

3.1 Assessment Factor Discussion

Under Schedule B of the WPCF permit it states that the Systemwide Assessment must include, *"an inventory of all injection systems that receive stormwater or other fluids and their locations by latitude and longitude in decimal degrees using the NAD 83 datum"*. This section explains the current UIC Inventory, which can be seen in detail in Attachment A: Systemwide Assessment Data.

Having an updated and accurate UIC inventory with details of the location, physical characteristics and relation to various pollutant source areas is important for effective management of the system. The City of Keizer only developed a specific stormwater program in 2007 when Keizer received a Phase II NPDES permit.

Since 2010, Stormwater staff has been acquiring data on stormwater assets including UIC systems, as outlined below:

- UIC Identification: The City of Keizer conducted field studies, aerial photo observations, and plan reviews to identify any public underground injection control facilities within city limits.

- Location: Upon identification, each UIC was entered into an ArcGIS spatial mapping database. The precise locations of all system components were located in the field using GNSS. The latitude and longitude were taken at the approximate center of each UIC drainage area.

3.2 Data Sources Used

The City of Keizer submitted UIC Registration Data in December 2011, using a spreadsheet format approved by DEQ and which was first used by the City of Bend. For the purposes of the Systemwide Assessment, the UIC Inventory is based on an updated version of this UIC Registration spreadsheet.

The UIC Inventory (see Attachment A: Systemwide Assessment Data) contains information on all City of Keizer UICs. For the purposes of this document, only the information relevant to the Systemwide Assessment was included. But the full UIC Registration data submitted to DEQ includes data from the following sources:

- ArcGIS Data (spatial/relational data and stormwater asset information)
- Oregon Water Resources Department (water well log data)
- Oregon Department of Environmental Quality (ECSI Cleanup Site Information)
- Oregon Health Authority (2 Year Time-of-Travel)
- City of Keizer Groundwater Elevation Model (groundwater elevation used to determine horizontal separation distance)

3.3 Findings

The UIC Inventory data was taken from the latest update to the UIC Registration data sent to DEQ in 2011. The updates/changes reflected in the updated data are summarized below:

- Removal of 9 Private UICs (which were discovered to be private after the registration data had already been submitted).
- Removal of 5 UICs (which were decommissioned in 2012 according to DEQ UIC Closure procedures, see Appendix A - Decommissioning Plan).
- Addition of 3 UICs into the category of being within a well setback, due to a more conservative analysis. Because most well logs only give an address for the taxlot, in order to 'capture' all UICs which *could be* within a well setback, the new analysis identified any point of injection within 500 feet of the *entire taxlot* containing a well.

3.4 Follow-up Actions

The City will submit updated UIC Registration information to DEQ with the WPCF first annual report.

Section 4 – Vehicle Trips per Day

4.1 Assessment Factor Discussion

Under Schedule B of the WPCF permit it states that the Systemwide Assessment must include, *"An estimate of vehicle trips per day for the area(s) drained by the injection systems"*. This section outlines the data and analysis used to determine which UICs accept drainage from roadways having > 1000 vehicle trips per day. All assessment factor data is included in Attachment A: Systemwide Assessment Data.

It is important to determine which UICs may receive drainage from high traffic areas, because these areas can be a source of specific pollutants (metals, oil and gas) which may exceed regulatory requirements. Knowing which UICs may be at risk for vehicle-related pollutants can help guide management activities.

4.2 Data Sources Used

Trips per day were estimated using two major sources, as there was not one single source addressing all roads in Keizer. Information on the data sources used to gather trips-per-day estimates are detailed below:

> Major Arterials (15-50,000), Minor Arterials (7-20,000), and Collector (1600-10000) estimates: In April, 2009 Kittelson & Associates, Inc prepared the *City of Keizer Transportation System Plan (TSP)*. These classifications were based on Design Standards and local surveys, and covered the range of estimated vehicular traffic for Major Arterials, Minor Arterials and Collector streets. See Figure 1 Keizer Transportation System Plan Map.
>
> Local Roads (< 1600): All UIC systems that did not fall in the categories above according to the map from the TSP were evaluated using the Institute of Transportation Engineers Trip Generation handbook to determine the rate(s) applicable to each system (based on specific land use). These rates, along with the characteristics (site specific evaluation of the conditions associated with each UIC) of the UIC (number of houses, etc.) were calculated to provide the remaining estimates.

4.3 Findings

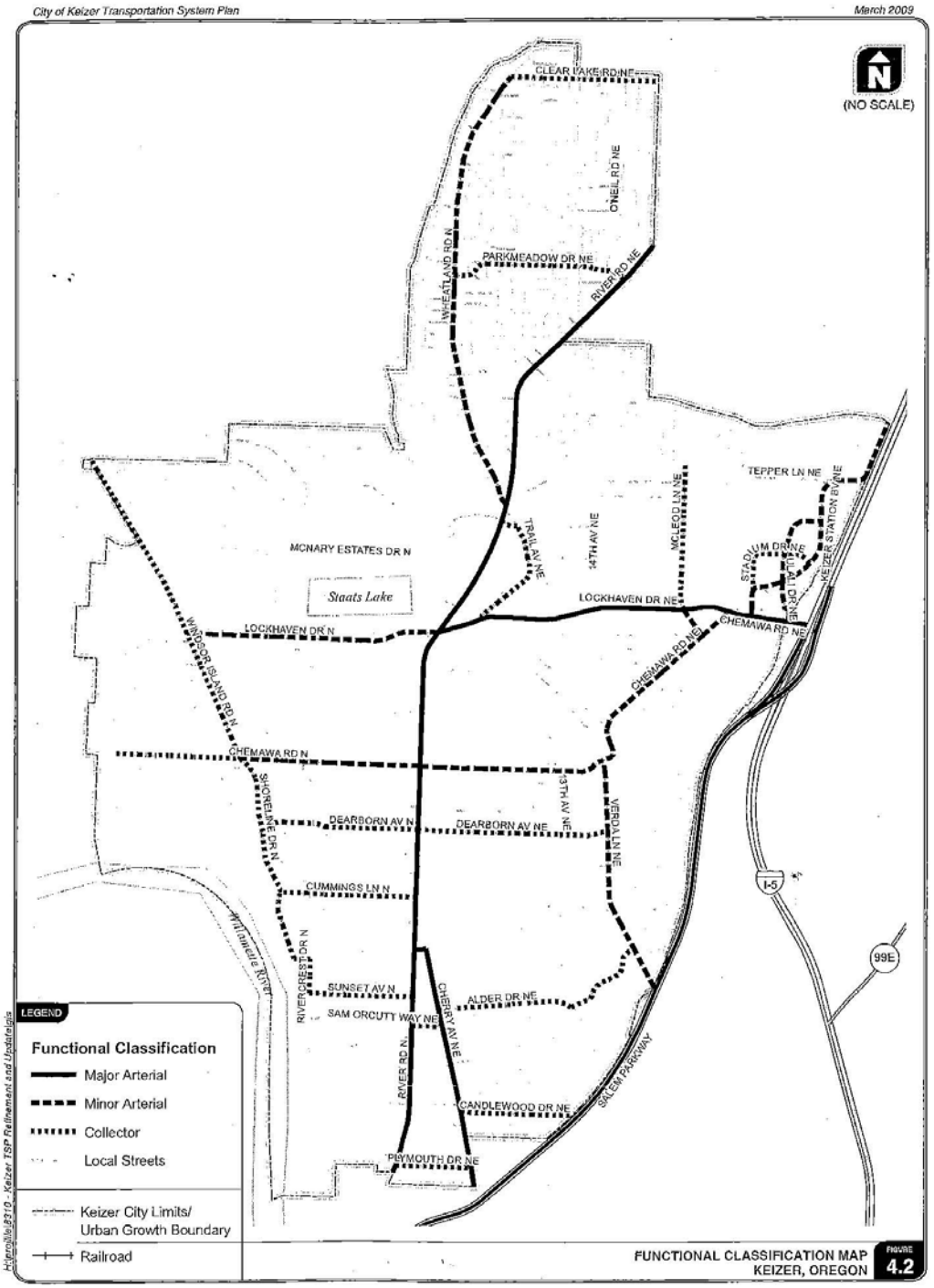
Of the City's 86 UICs, 25 may receive drainage from areas having vehicular traffic >1000 trips per day. The breakdown of findings is as follows:

Breakdown of UICs with >1000 Trips per Day (TPD)	
Local Roads (1000-1600 TPD)	4 UICs
Collector Roads (1600-10000 TPD)	16 UICs
Minor Arterials (7000-20000 TPD)	2 UICs
Major Arterials (15000-50000 TPD)	3 UICs

4.4 Follow-up Actions

None

Figure 1: Keizer Transportation System Plan Map



Section 5 – UICs Discharging to Groundwater

5.1 Assessment Factor Discussion

Under Schedule B of the WPCF permit it states that the Systemwide Assessment must include, *"An inventory of all injection systems that discharge directly into groundwater"*. This section describes the process and data used to identify any City owned or operated UICs which may directly discharge to groundwater. All assessment factor data is included in Attachment A: Systemwide Assessment Data.

WPCF permittees are charged with protecting groundwater from any impacts related to the permitted stormwater UIC system. UICs which directly discharge into groundwater merit special attention in terms of pollutant source analysis and consideration of nearby water wells.

5.2 Data Sources Used

In order to determine which UICs are installed in groundwater, the City had to determine two things for each UIC; the deepest point of injection, and the elevation of the groundwater at that location. Information on the data developed to determine these two factors is outlined below:

<u>Deepest Point of Injection</u>

Most City UICs are a network of shallow perforated pipe connected to catch basins. Some systems do employ dry wells or perforated manholes. The City determined the deepest point of injection for each UIC by taking field measurements whenever possible.

For UICs where the deepest injection point was not accessible (i.e. a horizontal perforated pipe with no structure at the end), the depth was estimated based on similar systems for which the depth was recorded at the time of installation.

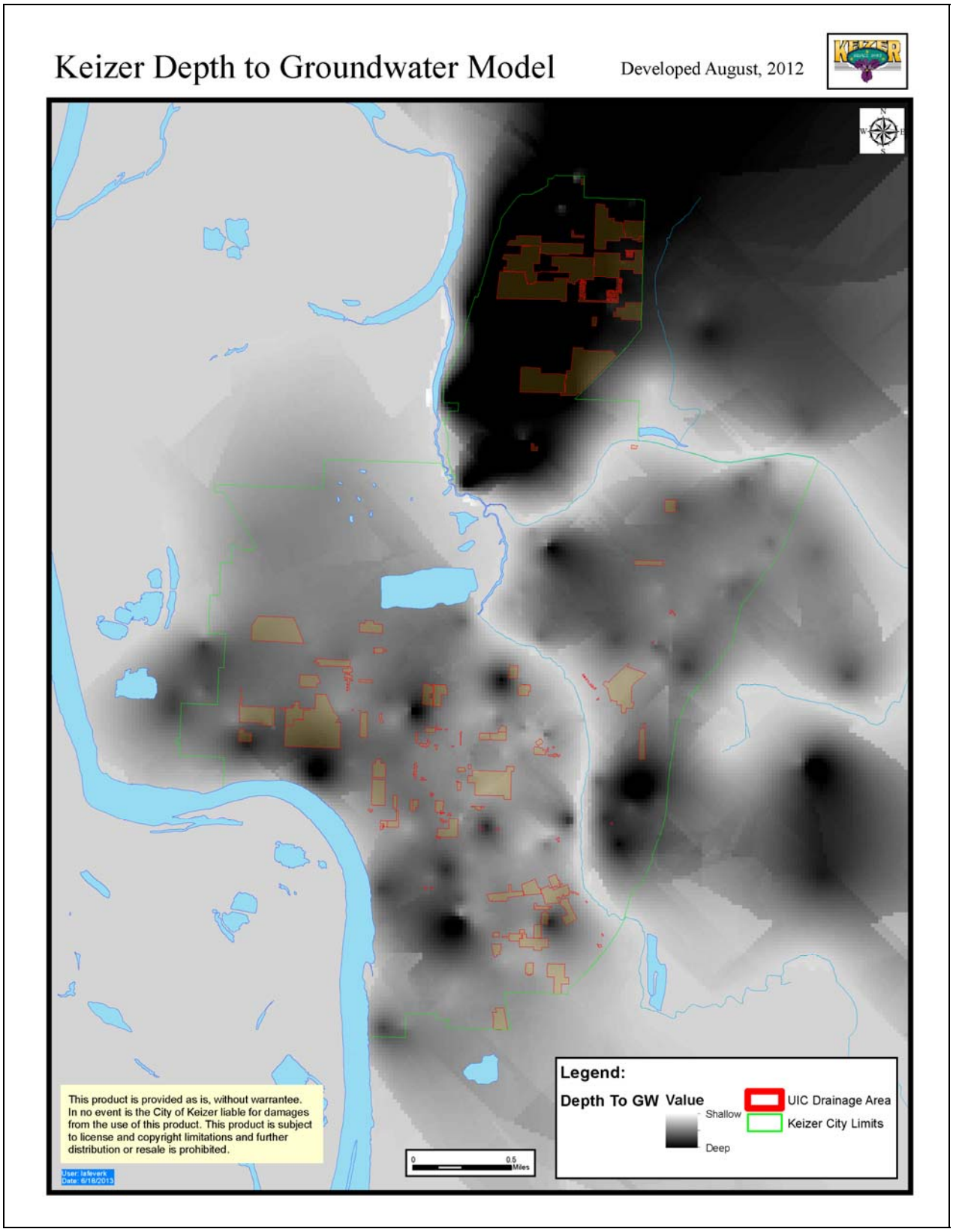
<u>Keizer Groundwater Elevation Model</u>

In order to determine which UICs might be installed in groundwater, City staff developed a Groundwater Elevation Model using a process similar to that which was conducted for Portland by the USGS. The model is based on well log data, surface water points, local geology, and topography to extrapolate a 'blanket' model of groundwater elevation.

In this way, the local groundwater elevation can be estimated at any point of injection. The model process was reviewed by DEQ staff, Greg Geist and Bill Mason, at a meeting to discuss all aspects of the Keizer Groundwater Protectiveness Demonstration in October 2012.

See Figure 2: Keizer Depth to Groundwater Model, for a graphic representation of the model data.

Figure 2: Keizer Depth to Groundwater Model Graphic



5.3 Findings

The City found only 1 UIC installed in groundwater (UIC 82). The UIC is very small (drains less than ¼ acre), and is made up of one catchbasin attached to a short length of horizontal perforated pipe. It was installed by the City to reduce standing water in front of a single-family dwelling.

Upon investigation, this UIC is located in a very 'low risk' area according to several factors, as follows:

- In an area served by underground electrical cables, so there are no wooden power poles (which are a source of pentachlorophenol, a Table 1 pollutant)
- In a low traffic area (estimated less than 50 vehicular trips per day)
- Over 1500 feet from the nearest water well intake point
- In a Residential cul-de-sac (no Commercial or Industrial runoff)

5.4 Follow-up Actions

Although UIC 82 is at very low risk for pollutants from most known sources, because the system is so small the City will investigate options for closure of this UIC. The City will report the findings of this analysis and any actions taken or planned for UIC 82 in the appropriate WPCF Permit Annual Report.

Section 6 – UICs within Well Setbacks

6.1 Assessment Factor Discussion

Under Schedule B of the WPCF permit it states that the Systemwide Assessment must include, *"An inventory of all injection systems that do not meet the setback distances listed in Schedule A"*. This section outlines the data and analysis used to determine which City UICs fall into one of the two currently defined well setbacks (500 feet or delineated 2-Year Time of Travel). All assessment factor data is included in Attachment A: Systemwide Assessment Data.

This assessment factor is important in terms of understanding the nearest point-of-use for groundwater, especially drinking water withdrawal points. All water wells (both drinking and irrigation) are considered important because irrigation water may be incidentally ingested, and irrigation wells may be converted to drinking water wells. The more distance between UIC injection points and any water withdrawal points, the more protective the situation, as pollutants are removed or diluted over distance.

6.2 Data Sources Used

City staff performed an ArcGIS desktop analysis to determine any points of injection which fall within defined well setback areas. This was a two-step analysis.

The first step was to put a 500 foot buffer around *all taxlots containing a well*. This is a conservative method of determination, since many well logs do not provide exact well locations. The 2-Year Time of Travel (TOT) was also mapped.

Then all points of injection (perforated pipe, perforated or bottomless structures) were mapped for each City UIC. Any UICs showing a point of injection within 500 feet of a well or within a 2-Year TOT were identified.

6.3 Findings

The analysis showed 59 UICs which fell either within 500 feet of a taxlot containing a water well or within a 2-year TOT delineation for a well.

Keizer has many domestic wells throughout the city limits. However, upon release of the Groundwater Protectiveness Model results, a protective WMA for Keizer UICs can be established, making the well setback number (500 feet) may become less relevant in the future. Model results are expected Fall 2013, and the next Systemwide Assessment may use WMA UIC setbacks as the more current measure of protectiveness.

Municipal water wells were still considered in the analysis, even though they are unlikely to be affected by any impacts to shallow groundwater. City wells are deep and cased, drawing water from a depth > 100 feet, with the majority of the wells drawing water from a depth of 120-300 feet. A confining clay layer separates shallow groundwater from the aquifers at a depth of 60-100 feet. One of the UICs which fell within well setbacks was solely due to proximity to a City well.

6.4 Follow-up Actions

This analysis was done using taxlots with water wells as the boundary around which to place the 500 foot buffer. However, once Groundwater Protectiveness Demonstration Model results yield a protective WMA boundary for Keizer UICs, this boundary will likely become the new 'standard' for horizontal setbacks. A new analysis will be done at that time to determine which City UICs have wells within their defined WMA. Keizer will also seek to determine actual water well locations.

Section 7 – Prohibited UICs

7.1 Assessment Factor Discussion

Under Schedule B of the WPCF permit it states that the Systemwide Assessment must include, *"An inventory of all injection systems that are prohibited by OAR 340-044-0015(2), which includes injection systems in vehicle maintenance areas, fuel dispensing areas, floor pits, non-vehicle maintenance facilities' floor drains, and fire station bay floor drain."*.

This section outlines the data and analysis used to determine which (if any) City UICs fall into one of the prohibited UIC categories above. All assessment factor data is included in Attachment A: Systemwide Assessment Data.

Prohibited UICs would be those found in areas which contain concentrated pollutants or which are subject to spills of pollutants or hazardous materials. All floor drains from these areas should be tied to sanitary sewer only. The analysis below covers all such areas owned or operated by the City.

7.2 Data Sources Used

Stormwater staff investigated all City properties which could have floor drains in prohibited situations. The following were analyzed:

- City Shop Facility – Site Visit and Plans Review
- City Parks Facility – Site Visit and Plans Review
- City Drinking Water Pump Stations – Drinking Water Staff Interview
- Keizer 1200Z – Review of Active Sites

The City does not own/operate the fire station, which is independently run as part of a separate Fire District. However, staff confirmed that building plans show no evidence of bay drain UIC.

7.3 Findings

There was no evidence found of any prohibited UICs in City owned or operated facilities.

The City Shop facility is a single two-story metal building which does contain space on the ground floor to park and perform maintenance on City field vehicles. Plans confirm that the floor drains in this building run to the sanitary sewer.

The City Parks Facility stores materials such as gravel, bark and sand in outdoor storage piles confined by large concrete block walls. The lot is partially graveled. There are no floor drains within the outbuildings.

Some City Drinking Water Pump Stations have floor drains inside the buildings, all of which have been confirmed to be connected to the sanitary sewer.

Keizer has no active 1200-Z sites at this time.

7.4 Follow-up Actions

In 2010, the City contracted a private Pipe Television and Inspection contractor to begin inspecting UIC and MS4 stormwater pipes in Keizer. This will be a decade long process to complete. The televised pipe inspection also makes note of any evidence of prohibited connections from sewer or from private floor drains. So far, no evidence of prohibited UICs has been found. See Section 6 & 9 of the UICMP for more details.

If staff discovers a prohibited area connected to a City UIC, Keizer will take action as per Schedule D (3) of the WPCF permit, which states:

Reporting and Corrective Actions for Underground Injection Systems Prohibited by OAR 340-044-0015. *Within 24 hours of discovery you must verbally or in writing provide DEQ with any information you have about prohibited underground injection systems. You must submit a written report within five days of discovery and take the following actions unless otherwise approved by DEQ:*

a. *To the extent practicable, you must temporarily divert the discharge away from the UIC within five days of discovering the UIC.*

b. *You must permanently close the prohibited injection systems as soon as practicable, with DEQ approval of work scope and schedule.*

Section 8 – Industrial/Commercial Properties Posing Polluted Drainage Risk

8.1 Assessment Factor Discussion

Under Schedule B of the WPCF permit it states that the Systemwide Assessment must include, *"An inventory of all industrial facilities and commercial properties that pose a risk of pollutant discharge to injection systems that you own or operate"*. This section explains the data, analysis, and findings for this category.

Assessing the potential for drainage from properties with higher risk of pollutant discharge is key to protecting City UICs from pollutant impacts. Stormwater runoff in general is very low in pollutants, but runoff from commercial, industrial or sites using or storing hazardous materials in reportable quantities (*hereafter called SARA sites*) have a higher potential to contribute pollutants and must be assessed.

All assessment factor data is included in Attachment A: Systemwide Assessment Data. Further information on this analysis may also be found in Attachment B: Commercial/Industrial Discharge Potential Analysis Result.

8.2 Data Sources Used

A desktop analysis in ArcGIS was performed to determine all commercial, industrial and SARA sites (properties using or storing hazardous materials in reportable quantities) in Keizer. SARA Site Data for this analysis was pulled from *The Businesses with Reportable Quantities Keizer Fire District Report*, October 2011.

The list of properties was brought into ArcGIS and geo-coded, it was then individually spot checked to verify accuracy of geo-coding and to make any corrections needed. Commercial and Industrial zoned taxlots were also mapped, and confirmed visually. Then aerial photos from 2011 and contours were placed to help with decisions in regards to threat of discharge.

Once these taxlots were mapped, staff used mapped contour lines, UIC drainage intake points, impervious surfaces, curb lines, MS4-connected pipes and aerial photos to perform a desktop analysis. Each SARA, Commercial or Industrial taxlot was analyzed to determine if any UICs which could receive drainage from these taxlots.

8.3 Findings

8.3.1 <u>SARA Listed Properties with the Potential to Discharge</u>

A total of 9 UICs could be impacted by SARA listed sites (properties known by the Fire Marshal, to use or store hazardous materials in reportable quantities. These UICs include the following: UIC 16, 17, 18, 25, 56, 76, 97, 101, and 110.

SARA Sites Which Could Potentially Discharge to a UIC		
Business Name:	**Taxlot**	**UIC Impacted**
Sherwin Williams	073W02BD13100	UIC 17

SARA Sites Which Could Discharge to UIC		
Business Name:	**Taxlot**	**UIC Impacted**
Loren's Sanitation	073W03BA02100	UIC 16, UIC 18, UIC 110
City of Keizer*	0623W26AD01500	UIC 25
Hertz Rental	073W11BD02200	UIC 97
Gary's Automotive	073W11AC06800	UIC 56
G & S Machine	073W11BD00600	UIC 97
Copper Creek Mercantile	073W02CB04600	UIC 76
Advantage Precast	073W11AC07700	UIC 101
Adam's Automotive	073W11AC04600	UIC 101

** The only UIC which receives drainage from a City owned or operated property containing hazardous materials is UIC 25 at the Meadows Pump Station. The Water Distribution Supervisor confirmed that these materials are stored properly in an isolated area that cannot reach the UIC.*

8.3.2 Other Commercial/Industrial Properties with the Potential to Discharge

There were also a total of 63 industrial or commercial taxlots which fell within range of the drainage areas of 13 UICs (UIC 7, 10, 16, 17, 18, 54, 56, 66, 72, 90, 93, 97, and 101). Of these taxlots, 21 were industrial (affecting 3 UICs) and 41 commercial. The analysis used to determine whether drainage from these properties could conceivably reach a UIC was purposefully broad, in order to catch all conceivable properties of concern.

For detailed data on the entire analysis, see Attachment B: Commercial/Industrial Discharge Potential Analysis Results.

8.4 Follow-up Actions

The properties listed above will be more closely analyzed to determine actual level of risk and targeted outreach efforts. See Section 6 of the UICMP for details on BMPs directly related to this assessment factor.

Attachment A: Systemwide Assessment Data

Sched. B - 1.a			Sched. B - 1.b	Sched. B - 1.c	Sched. B - 1.d	Sched. B - 1.e	Sched. B - 1.f
UIC #	Latitude	Longitude	Trips per Day	Direct Discharge GW	Setback (Feet)	Prohibited	Land Use
1	44.994	-123.018	66.99	No	97	No	RSF
2	44.998	-123.013	660.33	No	208	No	RSF
3	44.999	-123.013	660.33	No	426	No	RSF
4	45.000	-123.015	660.33	No	860	No	RSF
5	45.000	-123.015	660.33	No	886	No	RSF
7	44.996	-123.030	827.39	No	800	No	CO/ RMS
8	45.022	-123.022	622.05	No	420	No	RSF
9	45.001	-123.036	76.56	No	440	No	RSF
10	44.993	-123.022	573.61	No	188	No	CO/ CMU/ RSF
11	44.999	-123.031	165.75	No	796	No	RSF
12	44.998	-123.030	153.12	No	684	No	RSF
13	45.000	-123.039	204.75	No	217	No	RSF
14	45.002	-123.049	1,600-10,000	No	488	No	RSF
15	44.997	-123.050	1,600-10,000	No	200	No	RSF
16	44.995	-123.044	1,600-10,000	No	596	No	RSF
17	44.992	-123.028	421.08	No	116	No	CO/ RSF
18	44.997	-123.045	1,600-10,000	No	705	No	RSF
19	44.999	-123.042	369.04	No	821	No	RMD
20	45.000	-123.039	440.22	No	217	No	RSF
21	44.998	-123.011	7,000-20,000	No	178	No	RSF/ RMD/ RMLU
23	45.028	-123.013	1177.11	No	70	No	RSF
24	45.028	-123.010	392.37	No	545	No	RSF
25	45.023	-123.014	15,000-50,000	No	130	No	RSF
27	45.033	-123.011	19.14	No	350	No	RSF
28	45.034	-123.011	267.96	No	355	No	RSF
30	44.990	-123.037	1,600-10,000	No	780	No	RSF
31	44.995	-123.037	153.12	No	410	No	RSF
32	44.991	-123.036	239.25	No	348	No	RSF
34	44.984	-123.030	1,600-10,000	No	617	No	RSF
35	44.984	-123.030	1,600-10,000	No	730	No	RSF
36	44.980	-123.020	248.82	No	147	No	RSF
38	44.989	-123.025	239.25	No	127	No	RSF
39	44.989	-123.023	239.25	No	183	No	RSF
40	44.995	-123.018	76.56	No	155	No	RSF
41	45.000	-123.015	660.33	No	795	No	RSF
43	44.989	-123.029	19.14	No	388	No	RSF
44	44.990	-123.029	153.12	No	419	No	RMD
45	44.990	-123.029	1,600-10,000	No	478	No	RMD
46	44.990	-123.029	1,600-10,000	No	456	No	RMD

Sched. B - 1.a			Sched. B - 1.b	Sched. B - 1.c	Sched. B - 1.d	Sched. B - 1.e	Sched. B - 1.f
UIC #	Latitude	Longitude	Trips per Day	Direct Discharge GW	Setback (Feet)	Prohibited	Land Use
47	44.990	-123.028	1,600-10,000	No	644	No	RSF
48	44.991	-123.030	363.66	No	596	No	RSF
49	44.991	-123.030	363.66	No	579	No	RSF
50	44.988	-123.017	497.64	No	302	No	RSF
51	44.984	-123.019	1,600-10,000	No	73	No	RSF/ RLD
53	44.984	-123.017	105.27	No	289	No	RSF
54	44.984	-123.024	1,600-10,000	No	109	No	RSF/ RMD/ MU
55	45.000	-123.039	851.73	No	344	No	RSF
56	44.978	-123.019	1,600-10,000	No	170	No	IU
57	44.981	-123.022	129.28	No	282	No	RSF
58	44.982	-123.019	114.84	No	160	No	RSF
59	44.982	-123.018	76.56	No	140	No	RSF
60	44.980	-123.012	210.54	No	406	No	RSF
61	44.981	-123.012	373.23	No	214	No	RMD
62	44.993	-123.032	114.84	No	561	No	RSF
63	44.995	-123.032	774.48	No	685	No	RSF
64	44.995	-123.031	774.48	No	773	No	RSF
65	44.995	-123.030	774.48	No	978	No	RSF/ RMD
66	44.990	-123.025	1406.06	No	295	No	CO/ MU/ RMD
67	45.031	-123.024	1177.11	No	68	No	RSF
69	45.032	-123.024	803.88	No	84	No	RSF
72	44.996	-123.029	741.8	No	1031	No	CO/ RMD
76	44.988	-123.028	421.08	No	464	No	RSF
79	44.989	-123.035	296.67	No	678	No	RSF
81	45.000	-123.022	459.36	No	420	No	RSF
82	45.017	-123.010	47.85	Yes	1697	No	RSF
83	44.999	-123.020	114.84	No	627	No	RSF
84	44.995	-123.018	95.7	No	95	No	RSF
88	44.998	-123.050	527.2	No	720	No	RSF
89	44.992	-123.031	229.68	No	934	No	RSF
90	45.005	-123.005	7,000-20,000	No	96	No	MU
91	45.034	-123.013	717.75	No	408	No	RLD
92	44.995	-123.032	86.13	No	673	No	RSF
93	44.996	-123.027	942.76	No	957	No	CMU/ CLU/ RMD
94	44.995	-123.050	478.5	No	128	No	RSF
95	44.997	-123.008	655.12	No	377	No	RSF/ P
96	44.996	-123.019	16	No	443	No	P
97	44.979	-123.023	15,000-50,000	No	234	No	CR/ CG/ IBP
99	45.037	-123.016	28.71	No	64	No	UT
100	44.995	-123.028	774.48	No	860	No	RMD
101	44.979	-123.016	1,600-10,000	No	354	No	IG/ RMD

Sched. B - 1.a			Sched. B - 1.b	Sched. B - 1.c	Sched. B - 1.d	Sched. B - 1.e	Sched. B - 1.f
UIC #	Latitude	Longitude	Trips per Day	Direct Discharge GW	Setback (Feet)	Prohibited	Land Use
103	45.014	-123.007	1,600-10,000	No	940	No	RSF
104	44.999	-123.037	957	No	557	No	RSF
105	45.000	-123.015	660.33	No	886	No	RSF
107	45.003	-123.008	7,000-20,000	No	81	No	RSF
108	45.028	-123.025	1244.1	No	193	No	RSF
110	44.997	-123.046	1,600-10,000	No	500	No	RSF

Attachment B: Commercial/Industrial Potential Discharge Analysis Results

Commercial/Industrial Properties with the Potential to Discharge

There are a total of 62 taxlots of concern that fall within range of 13 UICs (UIC 7, 10, 16, 17, 18, 54, 56, 66, 72, 90, 93, 97, and 101). Of these taxlots, 21 are industrial and 41 commercial. Results follow:

UIC 7				
UIC #	**Land Use**	**Taxlot #**	**Address**	**If Yes then justification**
7	CO	073W02BB06000	4952 ELIZABETH ST N	The only drains near this property, drain into the UIC
7	CO	073W02BB05800	351 JANET AV N	The only drains near this property, drain into the UIC
7	CO	073W02BB05900	4954 ELIZABETH ST N	The only drains near this property, drain into the UIC

UIC 10				
UIC #	**Land Use**	**Taxlot #**	**Address**	**If Yes then justification**
10	CO	073W02BD07800	4720 - 4754 RIVER RD N	All storm drains associated with this taxlot drain into the UIC
10	CO	073W02BD07700	513 - 593 LINDA AV NE	All storm drains associated with this taxlot drain into the UIC
10	CO	073W02BD05900	590 - 592 DEARBORN AV N	There is a drain in the street to the north of the property however contours suggest that under the right circumstances runoff from the property could enter the UIC's storm drains.
10	CO	073W02BD07900	4710 RIVER RD N	Property is inside UICs drainage areas and its drains connect to the UIC
10	CR/CO	073W02BD08000	524 LINDA AV NE	Property is inside UICs drainage areas and its drains connect to the UIC
10	CO	073W02CA04000	4630 RIVER RD N	Contours suggest runoff could make it into UIC

UIC 16				
UIC #	**Land Use**	**Taxlot #**	**Address**	**If Yes then justification**
16	CG	073W03BA01900	1101 CHEMAWA RD N	Could potentially run into the drainage of the UIC
16	CG	073W03BA01800	1091 CHEMAWA RD N	Could potentially run into the drainage of the UIC
16	CG	073W03BA01500	5045 WINDSOR ISLAND RD	Could potentially run into the drainage of the UIC
16	CG	073W03BA01600	5015 WINDSOR ISLAND RD	Taxlot falls inside of the UIC drainage basin

UIC 17				
UIC #	**Land Use**	**Taxlot #**	**Address**	**If Yes then justification**
17	CR	073W02BC05700	4715 RIVER RD N	Runoff could reach drainage area

UIC 18				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
18	CG	073W03BA02000	1121 CHEMAWA RD N	Could potentially run into the drainage of the UIC
18	CG	073W03BA01900	1101 CHEMAWA RD N	Could potentially run into the drainage of the UIC

UIC 54				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
54	CM	073W11BA02400	4070 CHERRY AV NE	Could drain into the perf pipe of UIC 54
54	CM	073W11BA02500	4050 - 4052 CHERRY AV NE	Could drain into the perf pipe of UIC 54
54	CM	073W11BA02600	945 ALDER DR NE	Could drain into the perf pipe of UIC 54

UIC 56				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
56	IG	073W11AC05800	3602 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage
56	IG	073W11AC05900	3622 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage
56	IG	073W11AC06000	3642 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage
56	IG	073W11AC06100	3662 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage
56	IG	073W11AC06200	3661 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage
56	IG	073W11AC06300	3641 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage
56	IG	073W11AC06400	3621 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage
56	IG	073W11AC06500	3601 CHERRYLAWN CT NE	It is apparent the UIC is this property's drainage

UIC 66				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
66	CM	073W02CA08101	530 - 550 DIETZ AV NE	Property falls on top of and immediately drains into UIC.
66	CR	073W02CA08200	4510 RIVER RD N	Anything not caught by drain at the Eastern center part of the eastern property will discharge into the UIC
66	CM	073W02CA08102	Unknown	Property will drain down slope directly into the UIC
66	CR	073W02CA08100	570 - 650 DIETZ AV NE	Has a storm drain an pipe that head right towards the UIC anything not caught in this will run down slope into the UIC

UIC 72				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
72	CO	073W02BB05700	291 JANET AV N	Closest drains to the property are the UIC's
72	CO	073W02BB05600	271 JANET AV N	Closest drains to the property are the UIC's
72	CO	073W02BB05500	251 JANET AV N	Closest drains to the property are the UIC's

UIC 90				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
90	CO	063W36CB00401	5775 MCLEOD LN NE	Unlikely but is close enough and at the proper grade to catch run off from site in large rain event

UIC 93				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
93	CO	073W02BC02400	120 CHURCHDALE AV N	The closest drains to property enter the UIC
93	CR	073W02BC00300	4905 RIVER RD N	Property lies right next to and drains into the UIC
93	CR	073W02BC00200	4907 RIVER RD N	Property lies right next to and drains into the UIC
93	CR	073W02BC00100	4915 RIVER RD N	There is a drain on the property; however which direction its pipe goes is unknown. Property lies on the boundary of the UIC
93	CR	073W02BB05000	4925 RIVER RD N	There is a drain on the property; however which direction its pipe goes is unknown. Property lies on the boundary of the UIC
93	CR	073W02BB04900	4943 - 4951 RIVER RD N	There is a drain on the property; however which direction its pipe goes is unknown. Property lies on the boundary of the UIC
93	CR	073W02BB04100	122 - 138 CHEMAWA RD N	There is a drain on the property; however which direction its pipe goes is unknown. Property lies on the boundary of the UIC
93	CR	073W02BB04800	4957 RIVER RD N	Property could run off into UIC there are no other drains on it

UIC 97				
UIC #	Land Use	Taxlot #	Address	If Yes then justification
97	CG	073W11BD00600	3708 CHERRY AV NE	Property falls within the UIC drainage area
97	CR	073W11BD00800	1025 SHADY LN NE	Property falls within the UIC drainage area
97	CR	073W11BD00700	3704 CHERRY AV NE	Falls directly in and drains into the UIC
97	CR	073W11BD08200	3701 CHERRY AV NE	Falls directly in and drains into the UIC
97	CR	073W11BD08300	3705 CHERRY AV NE	UIC drains are the closest to the property and contours are flat
97	CR	073W11BD08100	3691 CHERRY AV NE	Drains directly into the UIC
97	IBP	073W11BD02000	3690 CHERRY AV NE	Falls directly in and drains into the UIC
97	IBP	073W11BD01900	1036 SHADY LN NE	Closest drain is down slope into the UIC
97	IBP	073W11BD02100	3680 CHERRY AV NE	Closest drain is down slope into the UIC

97	IBP	073W11BD06700	3635 CHERRY AV NE	Closest drain is down slope into the UIC
97	IBP	073W11BD06800	700 BEVER DR NE	Closest drain is down slope into the UIC
97	IBP	073W11BD06900	998 BEVER DR NE	Closest drain is down slope into the UIC

UIC 101				
UIC #	**Land Use**	**Taxlot #**	**Address**	**If Yes then justification**
101	IG	073W11AC07800	1302 CANDLEWOOD DR NE	Property falls in and drains into the UIC drainage area
101	IG	073W11AC07900	1310 CANDLEWOOD DR NE	Property falls in and drains into the UIC drainage area
101	IG	073W11AD02700	3627 BROOKS AV NE	Closest drain is down slope into the UIC
101	IG	073W11AD02000	1335 CANDLEWOOD DR NE	Closest drain is down slope into the UIC
101	IG	073W11AC04400	1315 CANDLEWOOD DR NE	Closest drain is down slope into the UIC
101	IG	073W11AC04201	3645 BROOKS AV NE	Drain in SW into the UIC
101	IG	073W11AC04600	1255 CANDLEWOOD DR NE	The property falls right into the UIC drainage area

Appendix D

City of Keizer

UIC Decommissioning Plan

Planning & Reporting Procedures

For UIC Closure

January 2013

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1.0 Introduction

Underground Injection Control devices (UICs) are one of two common systems for managing stormwater runoff. UICs divert stormwater runoff into a system of perforated pipes and/or structures, which allow the water to infiltrate underground. The second method of stormwater control, called the MS4 (for Municipal Separate Storm Sewer System) directs flow to surface waters (usually a stream or ditch). Both systems serve to divert stormwater flows away; UICs to underground infiltration structures, and the MS4 system, to surface waters.

1.1 Purpose

The purpose of this UIC Closure Plan is to document the basic procedures for planning, implementing, and fulfilling the regulatory requirements involved in official closure of a UIC. In conformance with state and federal regulations, the Oregon Department of Environmental Quality (DEQ) requires that certain steps be taken by UIC system owners in order to close a UIC. These include:

- Submittal of a Pre-Closure Report documenting planned closure activities
- UIC sediment testing to determine contamination levels of materials to be removed
- Payment of a closure fee ($100 per UIC as of December 2012)
- Submittal of a final Closure Report documenting the work, and certified by the engineer or geologist, registered in the State of Oregon, who supervised the closure.

City of Keizer staff should use this UIC Closure Plan document as a guide for closure activities. The plan will be reviewed periodically, and updated as needed to stay compliant with DEQ regulations.

1.2 Regulations

The Environmental Protection Agency (EPA) has delegated DEQ authority to regulate the registration, permitting and decommissioning of UICs in Oregon. The DEQ has instituted state regulations which fulfill both new and existing Federal regulations regarding these systems. The Oregon Administrative Rutles (OARs) applicable to closure of UICs in the State of Oregon are found in OAR 340-044-0040 (see Appendix C for complete text).

Oregon statutes require the following actions for UIC closures:

- Closure work must be designed to prevent movement of contaminants into groundwater
- Pre-Closure Notification forms and data must be submitted to DEQ at least 30 days prior to closure work
- Lab testing of UIC sediment, and results must be reviewed by DEQ staff to establish the level of contamination and determine if special disposal methods or additional sampling is required
- DEQ approval must be received before closure activities begin

- All closure activities must be overseen and certified by professional geologist or engineer licensed in Oregon
- Submission of a final Closure Report to DEQ

2.0 Closure Planning

2.1 Benefit of Multiple Closures

DEQ requires the same forms, reports and sampling, regardless of whether the closure is for one UIC or many. If there are multiple UIC closures planned, it is preferable to plan and implement closures together, resulting in a savings of time and money. If the land use is the same for all UICs (e.g. Residential), a single 'composite' sample of sediment, taken from each UIC and mixed together, is acceptable and reduces lab costs.

2.2 DEQ Guidance

DEQ requires that any closure work meets the following conditions; 1) that *stormwater is no longer diverted underground to infiltrate,* and 2) that *no perforated void spaces remain behind*. The first condition may be met by removing the structures that collect and divert water to perforated structures (e.g. catchbasins), and the second by removing, filling or sealing any perforated structures so that infiltration no longer takes place. The second requirement is that *no void spaces may be left behind in perforated structures*; either the perforations must be removed, or the void space filled.

The DEQ has demonstrated some tolerance for small variations in closure techniques stated in the Pre-Closure Plan. As long as the above rules are adhered to, stormwater is no longer infiltrating from underground structures, and no void spaces are left behind within perforated structures, changes may be simply be noted, and passed on to regulatory staff for the closure report.

For instance, the Pre-Closure Plan may state that a manhole will be physically removed, but if instead it is filled with rock, and capped with 12" Controlled Density Fill (CDF), that is acceptable and should be noted for the Closure Report. If there is any question as to whether a particular closure technique is allowed, consult with Stormwater regulatory staff.

In the end, the closed UIC area *must have the following characteristics, whether or not it is connected to the MS4 system*:

- No water diverted underground to a perforated structure
- No sub-ground movement of water within a perforated structure
- No void space left behind in any perforated structure

Design deviations may happen in the field, if they conform to the above rules, and are noted in the Closure Report. See DEQ Fact Sheet, in Appendix C, for more details.

2.3 Design Details for Closure

When designing a closure, several options exist which conform to the rules of thumb outlined above. If an MS4 system is close, the UIC may be connected to it, and all the perforated structures removed or sealed. If a waterway or vegetated area is nearby, the UIC may be directed to it, unless it has other regulatory restrictions (e.g. Critical Basin designation on Labish Ditch) In a few cases, where the UIC is serving a very small area, the system may simply be closed and the surface runoff allowed to flow overland to the next MS4 or vegetated-area.

The design of the UIC closure must prevent any future sub-surface movement or infiltration of stormwater underground. Techniques for achieving this may include:

- Either grouting, lining, filling & capping, or physical removal of perforated pipes or structures (to prevent stormwater infiltration underground)
- In some cases, removal of catchbasins (to prevent surface flow from being directed underground).

Acceptable methods for decommissioning perforated structures include:

- For Perforated Pipe – Fill with CDF, fill with rock and capped at ends, or physically remove.
- For Perforated Structures – Grout perforations, fill with rock capped with 12" CDF, or physically remove. If structure is to be filled and left in place, remove rim & lid, and pave over.
- For Solid Pipe – UIC regulations do not require filling solid pipe, and it may be capped at both ends and left in the ground if desired.

2.4 Initial DEQ Contact

Once initial planning is complete, *contact DEQ staff to request sending initial information and a phone review.* It is preferable to have an initial review and feedback, before proceeding with sediment sampling and Pre-Closure packet preparation.

To assist in the discussion, be prepared with the following items before initiating DEQ discussion:

- Location of all UIC(s) to be closed, and the land use in each closure area
- Planned closure methods and procedures
- Planned sampling to characterizing UIC sediment for pollutants
- UIC Closure maps showing sampling locations, existing system, and system elements after closure
- Initial search of DEQ Profiler site for any nearby clean-up sites (see Sub-Section 3.2.4)

3.0 Pre-Closure Information

3.1 Sediment Sampling

Once DEQ has given the initial review, the next step is to perform pollutant sampling of the sediments from each UIC. The purpose of sediment testing is to provide information to DEQ regarding the level of pollution found in the UIC sediments to be removed. If pollutant levels are found to be high, the DEQ may require further testing, or may require hazardous waste disposal methods for any removed sediment.

If all the UICs to be closed are within a similar land use (e.g. residential), sediment samples may be taken from one representative structure within each UIC, the sample media mixed together, and a single composite sample sent to the lab for testing. Based on the "Closure of an Injection System" Fact Sheet, and feedback from DEQ staff, at least the following pollutants should be tested:

- Diesel Range Petroleum Hydrocarbons (NWTPH-Dx)
- Gasoline Range Petroleum Hydrocarbons (NWTPH-Gx)
- RCRA metals by Synthetic Precipitate Leaching Procedure (SPLP)

In addition, if the UIC has a nearby clean-up site listed in the DEQ Profiler webpage (see Sub-Section 3.2.4), additional pollutants of concern may need to be tested. If there is a question, contact DEQ closure staff for guidance in the need for additional pollutant sampling. All samples must be analyzed according to U.S. Environmental Protection Agency (EPA) approved methods, and measured to the detection limits set by Federal Drinking Water Standards. These may change over time, so confirm with the testing lab that they will conform to the current standards and limits.

Once lab samples have been analyzed, the results may be sent electronically to DEQ staff for review. If results are within acceptable limits according to DEQ, then no further testing is necessary. A copy of the lab results must also be included in the official Pre-Closure packet sent to DEQ.

3.2 Pre-Closure Packet

The Pre-Closure Packet is made up of several documents and reference materials designed to give DEQ review staff a full understanding of the proposed work and the local conditions surrounding UIC closure area(s). This will help ensure that groundwater is protected from contamination both during and after closure activities take place. Each individual Pre-Closure packet item is discussed below (see Appendix A for examples).

Once all items are prepared, send packet to DEQ review staff (electronically and hard copy). Also send a photocopy of the Pre-Closure forms (only) with a check for Closure Fee(s) check to Accounting at the DEQ Business Office (811 SW 6th Ave, Portland, OR 97204). A scan of all submitted materials in the packet should be kept for future reference.

3.2.1 Cover Letter

The cover letter should clearly outline the closure work proposed. This includes a summary of the enclosures, an outline of work to be done at each closure, the name and company of the overseeing certified engineer or geologist, a summary of the sampling plan, and proposed timeline for the work.

When planning the start and end work dates, keep in mind that the Pre-Closure materials must be received by DEQ *at least 30 days before proposed work start date,* and written approval must be received from DEQ before work can begin. The proposed timeline should be generous enough to account for any unplanned delays. The DEQ is likely to use whatever timeline is provided in the cover letter, so it is better to propose a 'finished by' date with plenty of leeway.

3.2.2 Pre-Closure Notification Forms

Pre-Closure Notification forms, with instructions, may be found on the DEQ UIC website, or at the following link: http://www.deq.state.or.us/wq/uic/forms.htm . Main points to note; all latitudes and longitudes must be in decimal degrees; SIC/NAICS Code is 9511; and one may simply make copies of page 2 of 4 (detailing the individual UIC closures) as many times as needed. Also note that 'average depth to groundwater' numbers are taken from Keizer's Groundwater Elevation Model, rather than from well logs (see Sub-Section 3.2.5). See the Appendix A for an example of properly filled-out forms.

3.2.3 UIC Site Maps

A site map (or maps) should be designed and included in packet materials, to denote the UICs to be closed, and the current configuration of pipes and structures. Sample locations for sediment testing should be clearly marked (at least one for each UIC to be closed). The map title should correspond to the cover letter (e.g. Site 1, Site 2, etc.) with the UIC number(s) and a nearby street or project name for ease of identification. If possible, include a second 'overview' map box denoting where the UIC is in relation to Keizer city limits.

As with all 'published' maps, include a detailed legend, disclaimer, north arrow, name of map creator and date created. Map symbols should be clearly identifiable in black and white and photocopies. See Appendix A for map examples.

3.2.4 DEQ Profiler Maps

The DEQ has a Facility Profiler webpage, which is designed to allow searches for clean-up sites and other areas of concern. The Pre-Closure Notification packet must contain a printed map from this site, showing all sites within a 0.5 mile radius of each UIC closure area.

To accomplish this, follow the steps below, for each UIC:

1. Go to the following website http://deq12.deq.state.or.us/fp20/
2. Choose Search by 'Address', and click 'Go'
3. Fill in street address at the center of the UIC to be closed, choose ½ mile radius

4. Under 'Limit Search', 'Program(s) within DEQ', choose 'Cleanup Sites (ECSI)', and choose Type as 'All ECSI'

5. Leave all other boxes as-is, then click 'View Results on Map' button at bottom

6. This will give you a map of all clean-up sites within a ½ mile radius of the UIC

7. Capture this graphic and include in Pre-Closure materials

3.2.5 Well Logs

Pre-Closure Forms require entering an 'average depth to groundwater' for each UIC. In the absence of better information, this number is derived from the static water level recorded on the nearest water well log (registered with State of Oregon Water Resources). However, Keizer has access to a Groundwater Elevation Model developed by stormwater staff, and which has been reviewed by DEQ. Therefore, 'depth to groundwater' numbers are taken from the model, rather than well log data (which can be misleading and inaccurate).

Nevertheless, DEQ forms require that a copy of the nearest water well log be included in the Pre-Closure packet. Use ArcMap with the UIC and Water Well shapefiles, to determine the closest well log. This information is also recorded for each UIC drainage area, in the shapefile table. Water well logs may be found in the Stormwater electronic files, currently located in *W:\STORMWATER\02 UIC-WPCF Permit\UIC Management Plan\System Wide Assessment\Well Logs for Nearest Well*.

3.2.6 Sediment Testing Lab Report

The sediment sampling results will have by this time already been given a quick review by DEQ staff. A full copy of the lab report must still be included in the Pre-Closure packet.

3.2.7 Closure Fee Check

The DEQ charges a fee for each UIC closure ($100 per closure, as of December 2012), which should be stated on the DEQ Pre-Closure Forms. The check is due when the Pre-Closure packet is turned in, so work with Keizer staff to procure a check, made out to DEQ, before packet materials are due.

Send a photocopy of the Pre-Closure forms (only) with a check for Closure Fee(s) check to Accounting at the DEQ Business Office (811 SW 6th Ave, Portland, OR 97204). A copy of this check should also be included in the packet of materials to DEQ UIC staff.

3.3 DEQ Approval to Proceed

Once the packet has been received and reviewed by DEQ staff, they will provide a letter or email to the Contact Person listed on the forms, to either give approval to proceed, or provide additional requirements before work can take place. If approval is given, the work may proceed, according to the plans discussed in the Pre-Closure Notification materials.

4.0 Closure Work and Reporting

4.1 Field Work

Once approval has been received from DEQ, field work may commence at any point. Before work proceeds, the chosen state-certified engineer or geologist must be notified of the upcoming work so that they may provide any input or oversight necessary. As work progresses, good field documentation should be kept on the work done, including a Work Order sheet outlining all materials and labor, with itemized costs, and any associated dump slips or other receipts. Photos should be taken of the work, including examples of pipe removal or placement, and filling/capping perforated structures.

All work must conform closely to the plans provided to DEQ. However, ***if there are unforeseen changes in to the techniques or procedures in the field, contact Stormwater regulatory staff as soon as possible (preferably before the work is done) to ensure that the new plans conform to DEQ guidelines***. See Sub-Section 2.1 for more details on the allowable closure techniques.

Any deviation from the approved plans laid out in the Pre- Closure Notification packet must be recorded and noted for inclusion in the final Closure report. Field work must be completed by the date stated in the cover letter of the Pre-Notification packet provided to DEQ. If it appears that delays may prevent completion by the stated date, inform DEQ staff of this possibility as soon as possible.

4.2 Final Closure Report

The purpose of the Closure Report is to finalize the activity with DEQ, and document the actual closure proceedings and outcome. The sections on the closure work will explain the actual closure actions (pipe removed and added, lining done, structures sealed or removed, etc.) and will provide (as much as possible) footages, maps and photos to document each closure. The materials included in the Closure Report packet are explained below. Example documents are provided in Appendix B.

4.2.1 Cover Letter

The cover letter for the UIC Closure report should clearly sum up the history of the closures and reports submitted to date (e.g. when the Pre-Closure report was submitted, when approval to proceed was given, sampling, etc.). Then a summary paragraph for each closure should detail the actual closure work that took place (as there may have been slight modifications to the original closure designs). See Appendix B for example cover letter.

4.2.2 Closure Report

The report includes an introduction section, a lab results summary, a closure work summary for each UIC describing and mapping the actual closure field work completed for each UIC, an official signed and stamped statement of closure from the overseeing engineer or geologist, and appendices with the Pre-Closure site maps and lab report from sediment sampling.

4.3 DEQ Confirmation of Closure

Once all is gathered together, send the cover letter with Closure Report to DEQ review staff (electronically and hard copy. After review, DEQ should respond with an official email or letter confirming the closure has been updated in their UIC records. A copy of the report should be sent (electronically) to DEQ staff responsible for registration of UICs, so the database is kept current. If you are unsure, check with your UIC closure DEQ staff person, to confirm what other staff may need copies of the closure report.

Appendix A

Example Pre-Closure Packet Materials

Appendix B

Example Closure Report Documents

Appendix C

State Regulations and Fact Sheet for UIC Closure

<u>State of Oregon Regulations Regarding UIC Decommissioning*</u>

OAR 340-044-0040

Decommissioning and Conversion Requirements for Underground Injection Systems

(1) When an underground injection system is no longer in use for injection or is abandoned, the owner or operator shall decommission the system or convert the system to another type of well in a manner that **will *prevent the movement of contaminants into groundwater***.

(2) The owner or operator shall ***notify the Director*** of the owner's or operator's intent to decommission or convert the injection system ***30 days prior to closure*** or conversion.

(3) The owner or operator shall comply with all reporting, licensing and design requirements of all applicable state and local laws when decommissioning or converting an injection system. These include OAR 340-071 for on-site sewage disposal systems, 690-200 and 690-220 for water supply wells, 690-240-030 for other holes and 632-020 for geothermal wells.

(a) Any soil, gravel, sludge, biosolids, liquids or other ***material removed from or adjacent to the injection system shall be characterized*** and disposed in a manner consistent with all applicable local, state and federal laws.

(b) Except for on-site sewage disposal systems decommissioned according to OAR 340-071 and injection systems for storm water runoff from rooftops, proper decommissioning of an injection system ***shall be certified by a professional geologist, engineering geologist, or professional engineer*** registered in the State of Oregon.

(c) The following decommissioning requirements apply to drilled wells, boreholes and sewage drain holes or sewage drill holes unless waived in writing by the Director:

(A) The owner or operator shall immediately render the system to be completely inoperable by plugging and sealing to prevent the vertical movement of fluids.

(B) All portions of the well that are surrounded by "solid wall" formation shall be plugged and filled with cement grout or concrete; or

(C) The top portion of the well must be effectively sealed with cement grout or concrete to a depth of at least 18 feet below the surface of the ground, or wherever this method of sealing is not practical, effective sealing must be accomplished in a manner approved in writing by the Director.

(4) If the Director determines that the injection system is high risk or potentially contaminated, the ***Director may require submission of a closure plan for review and approval prior to decommissioning. The owner or operator shall perform any sampling requested by the Director.*** The results of such sampling shall be reported to the Director. Detection of soil or groundwater contamination from the injection system shall be reported to the Director within 14 days of observation or receipt of sampling results.

* Some text above has been bolded and/or italicized for emphasis

Fact Sheet

Closure of an Injection System

Background

When an underground injection control system is not in use or abandoned, cannot be authorized by rule or permit, or is prohibited, the owner or operator must close the system. Oregon Administrative Rules for the state's Underground Injection Control Program specify closure requirements in OAR 340-044-0040. Other state and local requirements may also apply to closure of a UIC system, including Oregon Water Resource Department water well and other hole abandonment requirements for systems that are above or below the water table (OAR 690-220 and OAR 690-240 respectively). An owner must have written approval from DEQ before a system can be closed. A Water Pollution Control Facilities permit does not cover closure of a UIC system. The permittee must close the system as required below.

What if I don't formally close an injection system?

An owner or operator of a UIC system who fails to decommission a system in accordance with state and federal regulations is subject to state and federal enforcement action. An owner is also liable to a citizen lawsuit under the federal Safe Drinking Water Act.

What is a UIC system owner required to do?

An owner closing a UIC system must:

- Notify DEQ at least 30 days before intending to close the system by:
  - Filling out DEQ's UIC "Registration Pre-Closure Notification" form found at http://www.deq.state.or.us/wq/uic/forms.htm and include signature of owner or legally authorized representative and date.
  - Sampling the water and any sediment or sludge in the bottom of the UIC system.
  - Sending to DEQ the sample data, completed application, and fee of $100 for each injection system being closed.
- Submit a closure plan, if required by DEQ, which includes sampling and investigation requirements. DEQ may require this plan after reviewing the pre-closure notification form and sampling data submitted with the form.
- Obtain written approval from DEQ before closing the system.
- Close the system within the timeframe specified in the authorization by rule letter.
- Submit a closure report to DEQ within 30 days after closing the system.

What sampling is required?

DEQ requires sampling of any water and sludge or sediment in the bottom of a UIC system. If the system has a sedimentation manhole or associated piping that is part of the closure, the water and sludge or sediment must be sampled to determine proper disposal of the material.

Sampling data is used to determine if pollutants have leached to groundwater or are present in underlying soils between the bottom of the system and the water table. Analytical results should be compared to applicable federal Drinking Water Maximum Contaminant Levels and DEQ's cleanup risk-based concentrations for industrial soil, groundwater leachability and tap water.

The sampling data and analyses DEQ requires depend on the type of system and potential pollutants. All samples must be analyzed using U.S. Environmental Protection Agency approved methods. Most UIC systems receive stormwater from an area with vehicle traffic and the pollutants listed below are typically found in these systems. DEQ expects analysis of the following pollutants, and other pollutants on a case-by-case basis based on the site's current land use, depth to groundwater or if hazardous or toxic materials have been or are being used at the site in reportable quantities.

- Total Petroleum Hydrocarbons for diesel range (TPH-Dx)
- Total Petroleum Hydrocarbons for gasoline range (TPH-Gx)
- Heavy oil and grease
- Toxicity Characteristics Leaching Procedure (TCLP) for the eight metals set to assess suitability for sludge disposal at a landfill.

DEQ may require further sampling depending on the initial sampling results.

What is an appropriate closure method?

For most closures, an injection system can be either excavated and removed or closed in place. If a system is closed in place, usually the top four to eight feet of the system is removed; fill material is then placed in the hole to fill all voids and to seal over the top of the hole. Using a fill material of 300 pounds per square inch Controlled Density Fill meets or exceeds Oregon

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DEQ UIC Website:
http://www.deq.state.or.us/wq/uic/uic.htm

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By: Paula Calvert
11-WQ-062

Water Resource Department abandonment requirements.

A system owner must properly dispose of soil, gravel, sludge, liquids, and other materials removed from the system at an appropriate facility. The disposal of any material from the closure of a UIC system must be done in accordance with federal, state and local hazardous and solid waste regulations.

What types of injection systems are prohibited and must be closed?

Prohibited injection systems are listed in OAR 340-044-0015 and include:

- *Cesspools* used to dispose of fluids, unless the system an existing system, includes a treatment facility such as a septic tank, and is specifically permitted under DEQ's onsite wastewater treatment system rules in OAR 340-071. If a cesspool is attached to a drywell, the drywell must be closed under DEQ's UIC regulations.
- *Motor vehicle wastes* from vehicle repair or maintenance activities, including fire station engine bay drains and fuel dispensing areas.
- *Direct discharges to groundwater* include a system in which a drywell with "wet feet" is installed into the water table, seasonal high water table, or penetrates a confined aquifer.
- *Agricultural drainage*
- *Sewage drain and drill holes* used to dispose sewage, industrial, or commercial waste at a domestic or commercial site. Very few exceptions apply for continued use of an existing system under OAR 340-044.

What information is required in a closure report?

A UIC system owner must document procedures used to close the injection system. DEQ will not consider a UIC system closed until DEQ receives the closure report. UIC systems not requiring a closure report are systems only received roof drainage or domestic onsite system drainfields that only received domestic sewage.

All information required on DEQ's UIC "Registration and Pre-Closure Notification" form must be submitted. All log and analytical data required in the notification form and closure report must correlate to the site map and assigned UIC identification number.
The closure report must include the following:

- Name of the UIC system owner
- Existing land use of the site
- Date of closure
- Name of contractor or those who performed the closure
- Description of how the system was closed, including what materials were used to close the system
- Closure log showing the vertical depth of the UIC system and the vertical placement of the material used to close the system
- Copies of backfill material receipts
- Description of what samples were collected and at what depth, including chain-of-custody forms that document sample handling and transfer
- Summary of sampling data and analyses, including laboratory reports
- Description of how and where any materials removed from the UIC system were disposed of, and include the bill of laden from the facility that received the material and the bill of lading for disposal of the material
- If site is in cleanup, list DEQ regional contact information
- Existing type of pre-treatment, if any, associated with each UIC
- Photos and diagrams showing how the UIC system was closed
- A statement that the closure meets DEQ's closure requirements (OAR 340-044-0040) and Oregon Water Resources Department abandonment requirements (either OAR 690-240-0030 or 690-220-0030)
- The closure report must be certified by a registered State of Oregon licensed geologist, professional engineer with geotechnical expertise, or engineering geologist

For more information

Contact David Cole, DEQ regional hydrogeologist, Portland, at 503-229-6371, or call toll-free in Oregon at 1-800-452-4011, ext. 6371.

Further information on UIC system requirements is on DEQ's UIC website at http://www.deq.state.or.us/wq/uic/uic.htm

Alternative formats

Alternative formats (Braille, large type) of this document can be made available. Contact DEQ's Office of Communications and Outreach, Portland, at 503-229-5696, or call toll-free in Oregon at 1-800-452-4011, ext. 5696; fax to 503-229-6762; or email to deqinfo@deq.state.or.us

People with hearing impediments may call 711.

City of Keizer

Stormwater Monitoring Plan

August 2013

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Section 1 – Introduction

1.1. WPCF Permit Requirements

This document outlines the City of Keizer Monitoring Plan, which is a requirement of the Water Pollution Control Facilities (WPCF) permit. In Schedule B(2), the permit states that the submitted Stormwater Monitoring Plan must:

> ***a***. *Propose a sampling program representative of your injection systems based on the results of the System-Wide Assessment that characterizes the stormwater injected below ground so that you can demonstrate compliance with action levels in Schedule A Table 1. You may prioritize the monitoring based on potential risks to groundwater, considering such factors as vehicular traffic and land use.*
>
> ***b***. *Unless otherwise approved by us in writing, the Stormwater Monitoring Plan must include annual sampling of Schedule A, Table 1 constituents.*
>
> ***c***. *Include a list of underground injection system sampling locations.*

1.2. Groundwater Protectiveness Demonstration (Fate and Transport Model)

Keizer plans to select monitoring sites which characterize local stormwater inputs and which also represents the UIC system and various potential risk sub-categories. However, the City has contracted with GSI Water Solutions to perform a Groundwater Protectiveness Demonstration (GWPD) via a local Fate and Transport Model. The process began in July of 2012, and model results (including new Keizer-specific Waste Management Boundaries for UICs) are expected in the fall of 2013.

Because the model results are needed before sites are chosen, the location of the sampling sites may not be known at permit issuance. However, Keizer will submit chosen sample site locations to DEQ once model results are available and have been analyzed. The methodology for selecting sampling sites is included in the document below.

Section 2 – UIC System Overview

2.1. Keizer UIC System Description

The City of Keizer currently owns/operates 86 UICs within the city limits. Most of the UICs are configured as a network of catchbasins connected by horizontal perforated pipe. Of the 86 UICs, 20 are connected downstream to the MS4 system (sometimes with an overflow or weir). The majority of UIC drainage comes from residential, and to a lesser extent, commercial taxlots. There are only 2 UICs in industrially zoned areas.

2.2. Systemwide Assessment Findings

Part of the monitoring strategy includes representing areas at a higher risk for certain pollutants, as shown by the results of the Systemwide Assessment. The results of Keizer's Systemwide Assessment are outlined below:

- 25 UICs receiving drainage from roads with greater than 1000 trips per day
- 1 UIC installed in groundwater (City intends to pursue closure)
- 58 UICs within 500 feet of a water well; and 1 additional UIC >500 feet but within a 2 year Time of Travel delineation *
- No prohibited UICs found
- 13 UICs which could receive drainage from Industrial/Commercial properties

The above were required assessment factors from the WPCF permit, and identify areas at higher risk of pollutant loading. In addition to the above factors, the City will also take into consideration areas with high densities of wooden power poles, which are a potential source of Pentachlorophenol (a Table 1 Pollutant).

* *Note on Horizontal Setbacks: Once Keizer's Groundwater Protectiveness Demonstration (GWPD) results are complete, the model will determine a new protective horizontal distance, in the form of a Waste Management Area (WMA) around each UIC. When the new WMA distances are applied, the 59 UICs currently listed as being within horizontal setbacks will be replaced with the number of UICs with wells within their WMA boundary.*

Section 3 – Sampling Plan

3.1. Choosing Sampling Sites

Sample sites will not be selected until the results of the GWPD Model are available. However, the strategy for choosing sampling sites for the Keizer Monitoring Plan is outlined below:

- Sample sites will be chosen to *represent stormwater inputs* (both UIC and MS4)
- Sample sites will *represent possible pollutant source* areas as much as possible (UICs with >1000 TPD, Commercial/Industrial drainage, wooden power pole density, etc.)
- Sample Sites will be chosen predominantly from the "Response Needed" UICs (those *without protectiveness demonstrations*). See Section 3 of the UIC Management Plan (UICMP) for more details.

Sample sites will be chosen to represent overall stormwater inputs, and each category of possible pollutant source areas for Keizer. The sites will also be selected mainly or entirely from UICs which do not have a protectiveness demonstration if possible. In this way, monitoring information will help ensure that UICs which are inherently less protective will be actively monitored for impacts, so that protective steps can be applied as needed.

3.2. Stormwater Sampling Plan

Keizer proposes the following Sampling Plan elements for the first two years of sampling, with a reassessment to follow based on results. Actual sample locations will not be selected until after GWPD model results are complete (in Fall 2013):

- Select 6-8 representative sample sites (see Subsection 3.1)
- Sample two (2) storms per year for each site (proposed Table 1 Pollutants, below)
- Additional sampling may be performed in cases of Action Level exceedance
- Reassess the Sampling Plan after two (2) years, based on sampling results

3.3. Proposed Table 1 Sampling Pollutants

Keizer's proposed Table 1 Pollutants are below, with Action Levels:

TABLE 1 POLLUTANTS - Action Levels for Pollutants	
Monitoring Parameter	**Action Level at Injection Point (μg/L)**
Benzo(a)pyrene	2
Di(2-ethylhexyl)phthalate	300
Pentachlorophenol	10
Lead (Total)	500
Zinc (Total)	50,000
Copper (Total)	1300

The City may choose to sample additional pollutants not on the Table 1 Pollutant list, in order to gather information on emerging pollutants or other pollutants of interest. The City will include this sampling information on any additional pollutant sampling, when annual reporting takes place.

The Table 1 Pollutant List will be revisited after two years, during the reassessment of the Sampling Plan. At that time, some pollutants may be proposed for addition or removal from the Table 1 Pollutant List, based on sampling results.

Section 4 – Applying Corrective Actions

There are two instances when Corrective Actions may be necessary based on an exceedance of a Table 1 Pollutant sample – exceedances high enough to represent possible 'endangerment' and non-endangerment exceedances.

The WPCF Permit defines 'endangerment' as the following:

> ***Endangerment of health or the environment*** *means that discharge to an underground injection system is reasonably likely to lead to pollutant concentrations at a point of groundwater use that (a) exceed an applicable maximum contaminant level under 40 CFR part 141, or (b) exceed a groundwater quality reference or guideline level under OAR chapter 340, division 040, or (c) otherwise harm the beneficial use of groundwater. An exceedance of a discharge action level does not in itself constitute an endangerment of health or the environment.*

Given an Action Level exceedence event, the City will make a determination (through use of the GWPD model or other means) as to whether the exceedence represents a possible endangerment, and will apply the appropriate Corrective Actions to address the situation.

4.1. Corrective Actions in Cases of Possible Endangerment

In the case of a Table 1 Pollutant Action Level exceedence high enough to constitute a possible endangerment to groundwater, or in the case of a spill or other event which may endanger groundwater, the City will take the following required Corrective Actions:

4.1.1. Immediate DEQ Notification

In the event of a recognized possible endangerment of groundwater, the City will follow the reporting actions as required in the WPCF permit. In Schedule A, condition 4(a), the WPCF permit states, *"If discharges from one or more UICs endanger health or the environment, you must: a. Inform us consistent with Schedule F, condition 4(f)..."* which states:

> **f. Twenty-Four-Hour and Five-Day Reporting.** Unless a different compliance schedule and reporting requirements are otherwise noted in this permit, you must report any non-compliance that endangers health or the environment in accordance with 40 CFR 144.51(1)(6). You must provide any information of non-compliance that endangers health or the environment orally within 24 hours from the time you become aware of the circumstances. You must submit a written report within 5 days of the time you become aware of the circumstances.
> The written report must contain:
> i. A description of the violation and its cause, if known;
> ii. The period of violation, if known;
> iii. The estimated time the violation is expected to continue if it has not been corrected; and
> iv. Steps taken or planned to reduce, eliminate, and prevent recurrence of the violation.

4.1.2. Take Steps to Eliminate Endangerment with DEQ Approved Work Plan

In the event of a reported possible endangerment to groundwater, the City will follow the requirements for eliminating endangerment. In Schedule A, condition 4(b), the WPCF permit outlines the following required actions:

"Take corrective action to eliminate any endangerment of health or the environment. You must complete all corrective actions as soon as practicable, with DEQ approval of work scope and schedule. You must submit updates regarding progress to us at least annually, and you may include them in annual reports required under Schedule B, condition 4."

In summary, if a Table 1 Pollutant Action Level exceedance or other recognized event such as a spill occurs which is significant enough to constitute a possible endangerment of groundwater, the City will follow the required reporting and other actions outlined above.

4.2. Corrective Actions in 'Non-Endangerment' Cases

In the case of a Table 1 Pollutant Action Level exceedence which does not present a likely endangerment of groundwater, the City will utilize *the appropriate combination* of Corrective Actions listed below, in any order which best addresses individual exceedence circumstances.

4.2.1. Source Identification

In Schedule A, condition 4(c), the WPCF permit offers the following Corrective Action option in cases of pollutant exceedances, *"Attempt to identify the source(s) of an exceedance of Table 1 action levels"*. Source Identification would tend to be used in cases where the exceedence occurred at a UIC without applicable protectiveness demonstrations.

In the case of an exceedence, the specific pollutant which exceeded Action Levels will have likely sources associated with it. For example, an exceedence of Pentachlorophenol would lead staff to look in the area for a high density of wooden power poles, especially those which have been recently treated with insecticide, or which have bases housed in impervious materials which drain to a UIC.

In some cases the actual source may be more difficult to identify, such as the case with Di(2-ethylhexyl)phthalate, which comes from plastics, and which tends to be widespread. Exceedances which do not have an apparent source may be good candidates for re-sampling to determine if the cause was a one-time event such as an unreported spill or other temporary situation.

4.2.2. Identify UICs Implicated

In Schedule A, condition 4(d), the WPCF permit offers the following Corrective Action option in cases of pollutant exceedances, *"When source identification efforts are complete, determine the set of UICs that require corrective action, based on the identified source(s) or other factors"*. This Corrective Action would be typically be used in cases of a geometric mean exceedance of a specific pollutant.

If an exceedence is such that corrective actions must take place to mitigate or reduce a pollutant, the number of UICs implicated in the exceedence should be identified. In some cases, only the UIC with the exceedence will be implicated. But *if more than one exceedence takes place such that the geomean of the pollutant samples* exceeds Action Levels, then other UICs may be require attention.

In such cases, other UICs in the system *with similar pollutant source characteristics* should be identified. For instance, if a geomean exceedence of Pentachlorophenol is noted at a UIC which has a certain density of wooden power poles housed in impervious materials, it would be prudent to identify any other UICs with a similar density of these poles, and determine if they may also need corrective actions to reduce or mitigate the pollutant source.

4.2.3. BMP Assessment

In Schedule A, condition 4(e), the WPCF permit offers the following Corrective Action option in cases of pollutant exceedances, *"Assess whether best management practices need adjustment to eliminate or reduce influent concentrations and make appropriate, practicable changes"*. This corrective action would tend to be used in cases where the exceedence occurred at a UIC(s) without applicable protectiveness demonstrations.

In such cases, the pollutant which exceeded Action Levels will be associated with certain pollutant source conditions, which will naturally guide the assessment of BMPs to reduce the pollutant. For example, if a geometric mean of Benzo(a)pyrene samples exceed Action Levels, the most common source of this pollutant in stormwater would be vehicle related (especially from diesel engines).

Incomplete engine combustion can deposit Benzo(a)pyrene on roadways, to be picked up by stormwater runoff. Benzo(a)pyrene is also deposited from the atmosphere, a result of any combustion (residential wood burning, cigarettes). Therefore, a BMP like street sweeping may be implemented, or existing street sweeping increased in frequency, to reduce the source of Benzo(a)pyrene.

4.2.4. Resample

In Schedule A, condition 4(f), the WPCF permit offers the following Corrective Action option in cases of pollutant exceedances, *"Resample the discharge to UICs that had exceedances of Table 1 action levels to allow for calculation of a geometric mean that verifies or invalidates the original influent concentration"*.

This corrective action would tend to be used in cases where the exceedence occurred at a UIC(s) without applicable protectiveness demonstrations. It may also take place for exceedances in which it is not clear whether the source(s) involved are consistently in effect, or based on a one-time event.

In these cases, a second sample would be taken, in order to determine a geometric mean of the pollutant level at that UIC. If the second sample does not exceed the Action Level, then no further action would be necessary. If the geometric mean of the two samples still exceeds Action Level, then other Corrective Actions would be implemented to determine the source(s) and whether protective measures are required.

4.2.5. Demonstrate Protectiveness

In Schedule A, condition 4(g), the WPCF permit offers the following Corrective Action option in cases of pollutant exceedances: *"Demonstrate that groundwater is protected through modeling or other approved approach"*. This corrective action is one of the first things that should be considered in the event of an exceedence.

Protectiveness demonstrations, via the GWPD model results, or through other demonstrations, show that the exceedence in question will not affect groundwater beneficial uses (drinking water, irrigation, etc.). The first demonstration source would be

the GWPD model, which not only defines the WMA around UICs, but also can be run for specific pollutants.

For example, the protective WMA distance around Keizer UICs is based on ALL Table 1 Pollutants, including the most prevalent and most mobile. If a pollutant exceedence is for a less mobile pollutant, such as lead, the UIC may be protective within a much shorter distance. The GWMD model would be run for the pollutant(s) which exceeded, and if all water wells fall outside of the pollutant-specific WMA(s), the situation is still protective of groundwater.

There are other protective situations which, if defined, can constitute a protectiveness demonstration apart from model results. For example, if only municipal well(s) were within range of the UIC with the exceedence, municipal wells are deep and cased such that they are protected from shallow groundwater effects. Or in another example, additional information may lead to the determination that water well(s) near the UIC may in fact be abandoned, or located farther away than previously thought. Any protectiveness demonstrations would be submitted to DEQ and subject to approval.

4.2.6. Retrofit

In Schedule A, condition 4(h), the WPCF permit offers the following Corrective Action option in cases of pollutant exceedances, *"Retrofit the affected UIC(s) so that groundwater is protected"*. This corrective action would tend to be used in cases where the exceedence occurred at a UIC(s) without applicable protectiveness demonstrations, and which are found to have ongoing pollutant source issues which are well understood and difficult to remove or mitigate with other BMPs.

If a UIC has pollutant sources which are expected to present an ongoing issue, and which are not easily removed or mitigated, retrofitting is an option for reducing pollutants before they are injected into groundwater. Retrofits tend to be costly and time intensive to implement, and will usually be considered only after other measures are analyzed.

4.2.7. Decommission the UIC

In Schedule A, condition 4(i), the WPCF permit offers the following Corrective Action option in cases of pollutant exceedances, *"Decommission the UIC"*. This corrective action would be used in cases where all other options have been exhausted, and the pollutant sources cannot be mitigated to the extent necessary to protect groundwater and beneficial uses.

If closure is the option selected, the City will follow procedures as outlined in the UIC Decommissioning Plan (included as part of the UICMP).