City of Keizer

Systemwide Assessment

August 2013

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Attachments

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

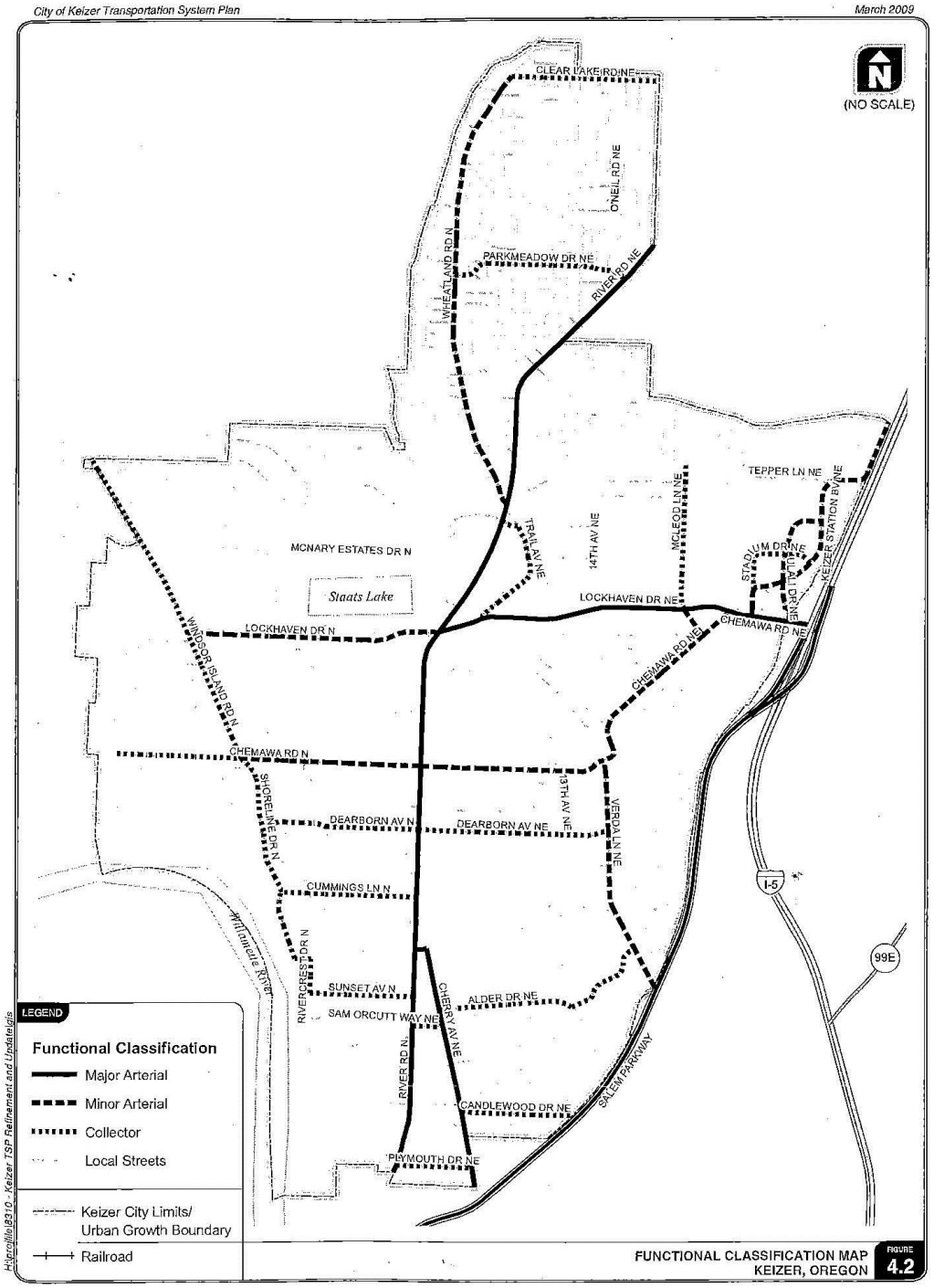
Of the City's 86 UICs, 25 may receive drainage from areas having vehicular traffic >1000 trips per day. The breakdown of findings is as follows:

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:

Deepest Point of Injection

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.

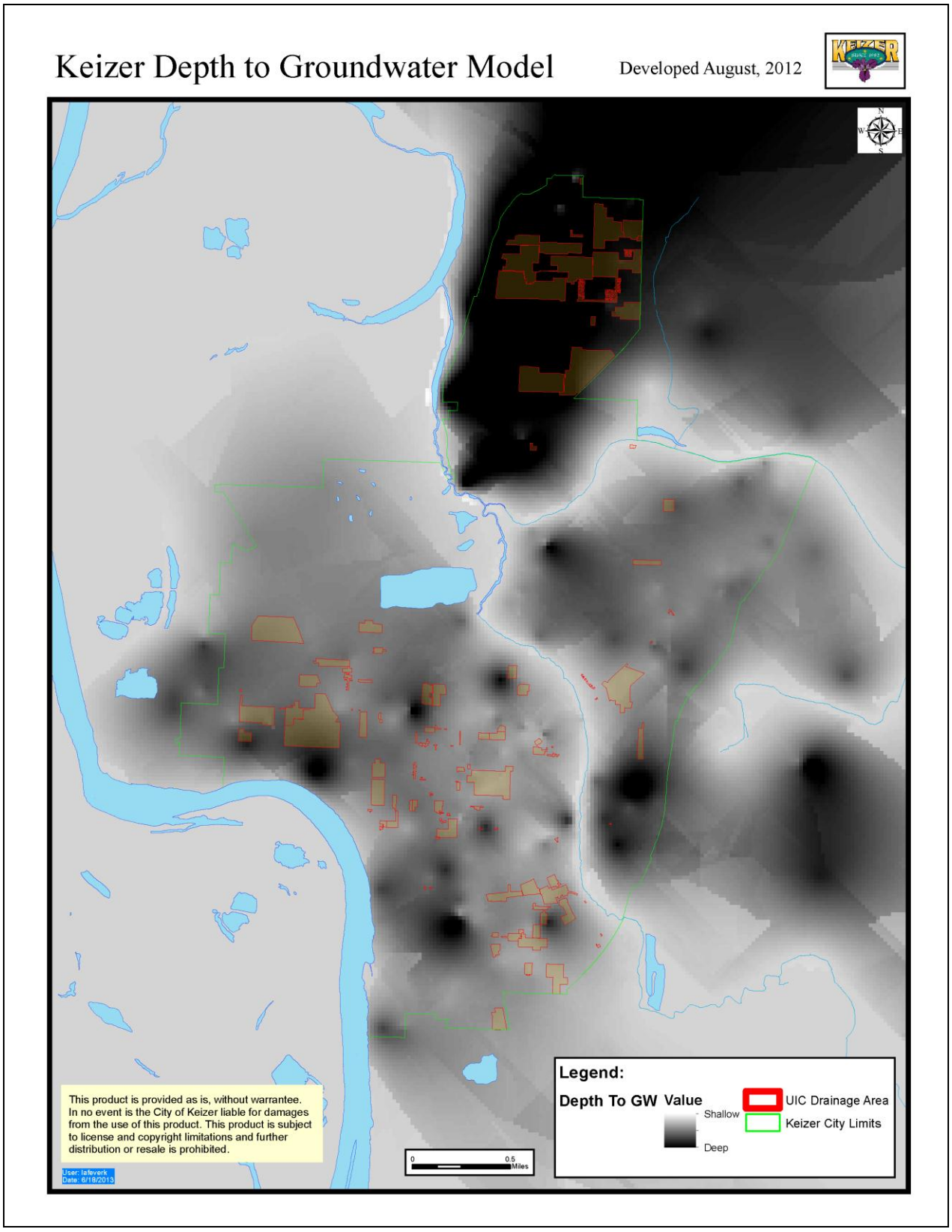
Keizer Groundwater Elevation Model

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 SARA Listed Properties with the Potential to Discharge

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