

SYSTEM-WIDE ASSESSMENT CITY OF GRESHAM October 2, 2012

Background

In 1974, Congress enacted Underground Injection Control (UIC) rules under the federal Safe Drinking Water Act (SDWA). These rules are administered by the U.S. Environmental Protection Agency (EPA) under 40 CFR 144-148. EPA delegated UIC rule primacy to the Oregon Department of Environmental Quality (DEQ) in 1984. The federal UIC rules were modified in 1999. In response to the new federal rules, delegated states were required to update their state UIC rules within 270 days. DEQ released revised UIC rules (Oregon Administrative Rules (OAR) 340-044) in September 2001. OAR 340-044 includes special requirements for municipalities with more than 50 UICs.

As a result of these requirements, the City of Gresham (City) conducted an inventory and system assessment and determined that most City Underground Injection Controls (UICs) qualified for rule authorization, but a small number would require a permit. The City applied for rule authorization in 2001, and submitted a Water Pollution Control Facility (WPCF) permit application for seven UICs in 2002.

In 2006, the City obtained approximately 350 UICs from Multnomah County, when responsibility for all formerly County-owned roads within Gresham was transferred to City ownership. Upon review of the new UICs, many of which were paved over, the City determined the new UICs would require permit coverage. In consultation with DEQ, in 2008, the City updated its permit application to include all City UICs—including those eligible for rule authorization.

In addition to the 2008 permit application update, the City submitted reports in December of 2009 and 2010 that detailed changes to the number, location, and status of its UICs. On June 30, 2011, the City submitted an additional permit application update that reflected discussions with DEQ regarding the anticipated permit.

An applicant review draft of a WPCF permit was presented to the City by DEQ in September 2011 (DEQ File Number 112110). The applicant-review draft of the WPCF permit for discharge of municipal stormwater to the ground via UICs required submittal of a Monitoring Plan, a System-wide Assessment (SWA), and a UIC Management Plan following permit issuance.

The City of Gresham requested approval of its monitoring plan concurrent with permit issuance; DEQ consented to review the monitoring plan, but required simultaneous submittal of the System-wide Assessment. The City submitted a System-wide Assessment with its applicant review comments on November 21, 2011. The SWA presented an updated list of UICs as of November 21, 2011, and incorporated by reference all information provided in previous submittals to DEQ, provided that information had not been superseded by a more recent submittal.

Based on significant public comment received on a draft WPCF permit written for another jurisdiction, DEQ re-evaluated its overall approach to the permit, and no permit was issued in 2011.

On September 10, 2012, DEQ sent Gresham a revised permit for applicant review. Gresham updated the system-wide assessment originally submitted in November, 2011 to meet the new permit requirements. This document constitutes that updated assessment. The information in all prior submittals is incorporated here by reference, except where data provided in this SWA is more current.

Since the first applicant review period, the City has conducted or commissioned significant assessments based on the November 2011 database. Those efforts, together with the fact that little development occurred between the two applicant review opportunities, mean that it is reasonable for the list and location of UICs described in this assessment to be the November 2011 list. However, work conducted since November 2011 has resulted in an updated list of water wells and a final list of UICs that must be retrofitted or decommissioned.

SWA Organization

Schedule B.1 of the applicant-review draft permit details the requirements of the system-wide assessment. This SWA quotes each requirement from the permit, followed by a narrative or tabular response, and a reference to a related map or table, as appropriate. Maps, Figure(s), Tables, and Appendix A are provided at the end of the report following the references. Maps and Table 1 are in pockets for easy access.

Response to Permit Requirements (Schedule B.1)

Permit text: B.1.a

“...The system-wide assessment must include, at a minimum:

- a. 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;”*

Response to B. 1.a

As of November 18, 2011, the City knew of 1100 UICs under its ownership. Data concerning the number and location of City UICs was updated in 2009 through a field survey in which staff walked the entire area known to contain UICs and used a global positioning system to document the location of each UIC to the nearest meter. Because the City inherited a number of paved-over UICs during a transfer of roads from the County, staff used a closed circuit TV push camera to locate UICs for which only catch inlets were visible from the surface. Since 2009, all new, newly discovered, decommissioned, or otherwise modified UICs have been recorded in the City’s GIS database when as-builts or other information has become available. The City provided latitude and longitude in WGS 84 datum, which is the technical

name for the more commonly referenced NAD 83.

The location of all known City UICs is shown on Map 1. Information associated with each UIC, such as latitude, longitude, bottom depth, land use, vehicle trips per day classification, presence of standing water, and monitoring status is provided in Table 1.

Permit text: B.1.b

“An estimate of vehicle trips per day for the area(s) drained by the injection systems;”

Response to B. 1.b.

Measured vehicle trips per day (TPD) were divided into two categories, based on evaluation of statewide stormwater data that showed a statistically significant correlation between TPD and pollutant concentrations when data was sorted by UICs receiving runoff from streets with greater than, and less than 1,000 TPD (Kennedy/Jenks, 2009).

TPD have been measured for many, but not all city streets. The City categorizes streets by the purpose served by the street—which roughly correlates to street size and vehicle trips. Staff reviewed TPD data for each street classification and concluded that most community level streets, and all streets in larger classifications have greater than 1,000 TPD. Nearly all residential streets have less than 1,000 TPD.

For mapping purposes, all residential streets were categorized as less than 1,000 TPD, and all streets that have a functional class of community street or greater (freeways, arterials, boulevards, parkways, and collectors) were assumed to have greater than 1000 TPD. While some community functional class streets had actual vehicle counts less than 1,000, the majority of streets within this class have greater than 1,000 TPD. The traffic volumes on some streets vary from year to year, and based on the fact that the WPCF permit term is ten years, the actual vehicle counts are expected to increase over time to better match the functional classifications. Two residential streets measured more than 1,000 TPD in 2010, but the next segment of those neighborhood streets measured below 1,000 TPD in 2011. In light of the variability from 2010 to 2011, the decision to classify these two streets along with other residential streets as less than 1,000 TPD is considered appropriate.

UICs selected for sampling under the UIC Stormwater Monitoring Plan will be evaluated to ensure that the traffic categorization seems appropriate. UICs on streets for which TPD class is uncertain or in flux will be omitted from consideration for water quality sampling, in an effort to avoid introducing error into future statistical analyses that stratify results by TPD. The pre-sampling field inspection described in the UIC Stormwater Monitoring Plan Section 3.3 describes this process.

Map 2 shows the TPD class associated with each UIC, and lists measured TPD by each street segment for which a measurement exists. It also shows land use. Table 1 lists the TPD class for each UIC.

Permit text: B.1.c

“An inventory of all injection systems that discharge directly into groundwater;”

Response to B.1.c

A study conducted by the United States Geological Survey (USGS) of groundwater levels in the Portland Basin (USGS, 2008) resulted in a map layer with estimated depth to groundwater, delineated in ten foot increments. The study reported the level of uncertainty associated with the estimates, since uncertainty

varies throughout the region based on the availability of accurate water well data. Additionally, the study estimated the magnitude of fluctuations in groundwater elevation that occur throughout the year. For the unconsolidated sedimentary aquifer (where Gresham's UICs are located), the report states that the water table fluctuation is 5.9 feet (it fluctuates approximately 3 feet above and below the mean level), so seasonal high groundwater levels were estimated to be 3 feet higher than the mean depth to groundwater data displayed on the map layer.

To determine which UICs discharge directly into groundwater requires both knowledge of the depth of groundwater, and the depth of each UIC. The latter information is not currently available for most city UICs. Depths, where known, were reported in the 2009 and 2010 annual reports to DEQ and the 2011 system-wide assessment.

The City obtained a State Revolving Fund (SRF) loan in 2009 which allowed the City to pay for cleaning and measuring the depth of UICs that may be too close to groundwater. In 2012, eighty UICs were selected for evaluation, based on a hypothetical UIC depth of 25 feet and the USGS depth to groundwater estimates, as well as city experience with UICs that don't drain well and the results of the 2009 system-wide survey—which documented UICs with standing water. (The City specification for new UICs is 25 feet of depth, and no UICs are known to exceed that number.) The 80 UICs are shown on Map 3, and Table 2 illustrates the application of the selection criteria.

The City developed and tested a protocol, known as the "wet feet protocol", to determine whether a UIC that doesn't drain has clogged, or extends into groundwater. Because the protocol requires cleaning of the UIC, the depth of each UIC was measured as part of the protocol. The protocol was implemented by the City's contractor, GSI, Inc. during the period of seasonal high groundwater in spring of 2012. UICs likely to have less than five feet of vertical separation between the bottom of the drywell and seasonal high groundwater were divided into five groups, based on the type of follow-up required to determine whether the UICs terminate in groundwater. The groups are shown on Map 3.

Because groundwater depths estimated based on the results of the wet feet protocol didn't match the USGS estimated depth near Group 1, 4, and 5 UICs, GSI drilled a total of ten boreholes to refine the depth to groundwater estimates. Additionally, the USGS-estimated depth to groundwater in an area of high surface elevation change (Group 2 UICs) was recognized as inaccurate, based on local groundwater seeps and GSI familiarity with the local geology. (The area had little data available for the USGS study.) Wet feet UICs in this area are presumed to terminate in groundwater, so no additional research was conducted for this group. Group 3 UICs were also presumed to terminate in groundwater, based on the results of the wet feet protocol.

The refined depth to groundwater information is shown on insets within Map 3, and the UICs that terminate in groundwater are also identified. Table 3 lists the UICs that were evaluated, and shows the vertical separation distance between the bottom of the UIC and seasonal high groundwater. Negative values indicate wet feet. The full report (GSI, 2012a) that describes the work and rationale for the conclusions is available for review, or upon request by DEQ.

Permit text: B.1.d

"An inventory of all injection systems that do not meet the setback distances listed in Schedule A;"

Schedule A.6.a and 6.b. mention two setback distances, and provide for use of a protectiveness demonstration in cases where the setback distances are not met:

- “a. **No Further Action.** You do not need to take further action for injection systems that are:*
- i. Outside the 2-year Time-of-Travel determined by the Oregon Health Authority for public water wells, and*
 - ii. More than 500 feet away from a public or private drinking water or irrigation water supply well.*
- b. **Existing Systems within Horizontal Setbacks**...for each existing injection system that does not have the horizontal setbacks described above, you must provide a protectiveness demonstration within one year of discovery to show that the existing underground injection system does not impair groundwater quality or supply...”*

Response to B.1.d and Schedule A.6.a

Schedule A.6.a requires horizontal separation between a UIC and a water well greater than both the two year time of travel (2 Yr TOT) and 500 feet. The City submitted a map showing the location of water wells, with established 2 Yr TOT and 500 foot radii with its initial request for rule authorization in 2001. However, over ten years have elapsed since the original submittal, and the metadata for the original water well map are not available. Additionally, staff is aware that new public water wells have been drilled since 2001. Staff therefore decided to update the water well location and use data during 2011 and 2012.

To update the water well location and use data, GIS staff downloaded data from all known sources of such data. The sources include:

- City of Gresham Water Division
- US Environmental Protection Agency
- United States Geological Services
- OR Department of Water Resources
 - Wells that have been located by State staff
 - Wells from state wells logs for which the data only specify the nearest quarter quarter section
 - Water Rights Data
- DEQ and Oregon Health Authority data indicating municipal water wells. (Many of these wells are co-located with wells found in other databases.)

Map 4 shows the multiple water wells listed in the various databases, identified by data source. Because of known non-specificity in the location data and the overlapping nature of the databases, it was expected that the initial list of water wells would be significantly longer than the list of actual wells.

In spring 2011 and 2012, Gresham staff researched the water wells: they visited all properties on which a well supposedly existed, called property owners by phone (when a phone number was available), and mailed letters to property owners who couldn't be reached by phone or during a site visit. The goal was to assemble complete information regarding location, depth, and use of water wells. In cases where no water well was found, the property owner was asked whether they knew of a neighbor with a well.

The location of water wells observed in the field was recorded using a global positioning system. The use of the water (drinking, irrigation, industrial, etc.) was recorded based on owner response¹, as well as the size of the group using the water to distinguish between public and private water supplies. Little information was obtained on the depth of water wells, because most owners didn't know the depth of their well. The full protocol is described in a report titled, “Water Well Identification and Location Protocol,

¹ One exception: the source of information related to water well use is different for monitoring wells; this use is apparent from the appearance of the well head.

May 2012.”

Gresham GIS staff added 500’ buffers around each water well, and obtained data from the Oregon Health Authority showing the 2 Yr TOT for public drinking water wells that have been formally designated. All water wells, 500’ buffers, and two year times of travel are shown on Map 5, along with the City’s UICs, and traffic data discussed above under Schedule B.1.b. Table 4 shows the vertical and horizontal setbacks for each of the UICs that are within water well setbacks.

Response to B.1.d and Schedule A.6.b

Of the 33 UICs that are less than 500’ horizontal feet from a water well, 24 have more than five feet of vertical separation between the bottom of the UIC and seasonal high groundwater. DEQ has previously approved a fate and transport model for unsaturated conditions in Gresham that demonstrates that groundwater is protected from contaminants found in stormwater if there is at least five feet of vertical separation, so these UICs do not require further corrective action (GSI, 2011; and DEQ, 2012). Nine UICs within a water well setback have inadequate vertical separation to ensure groundwater is protected. However, saturated conditions allow for pollutant attenuation—although the rate of attenuation is lower than for unsaturated conditions. The City commissioned GSI, Inc. to adapt and run a saturated zone model originally approved by DEQ for use by the City of Portland. The model calculates the horizontal distance that is required to attenuate stormwater pollutants to below detection levels under saturated conditions. For Gresham, that distance is 335 feet based on pentachlorophenol, the pollutant with the greatest number of benchmark exceedances in the Kennedy/Jenks (2009) report and also transport through the saturated zone. The model, input assumptions, and conclusions were provided to DEQ on October 2, 2012 (GSI, 2012b).

Based on the model results, four UICs have less than 335 feet of horizontal setback from a water well. Figure 1 shows the four UICs. These UICs are scheduled to be retrofitted within the next year. They are unlikely to constitute an imminent threat to human health because all of them have some unsaturated vertical separation distance, and the pollutant loads assumed by the models reflect numerous conservative assumptions, including pentachlorophenol concentrations at levels not seen in Gresham. Additionally, the modeled target concentration at the edge of the horizontal setback is background (i.e. less than detection), rather than the human health criterion. A contractor is currently developing concept plans for how the UICs may best be retrofitted. The options will include shortening the UICs, installing rain gardens, adding sedimentation manholes, and other potential retrofits.

Permit text: B.1.e

“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 drains;”

Response to B.1.e

Floor drains have historically been prohibited from discharging to the stormwater system in the City of Gresham, and none are known to exist. The floor drain in the City’s vehicle maintenance and repair shop drains to the sanitary system.

Permit text: B.1.f

“An inventory of all industrial facilities and commercial properties that pose a risk of

pollutant discharge to injection systems that you own or operate, at concentrations that exceed action levels in Table 1, or that endanger health or the environment;”

Response B.1.f

In conjunction with the 2009 UIC survey, City staff walked the entire area that has industrial facilities and commercial properties adjacent to streets draining to City-owned UICs. For each property, the slope was visually evaluated to determine the degree to which private runoff has the potential to enter a City-owned UIC. Generally speaking, only driveway approaches and streetside sidewalks drain to the street, and therefore to City-owned UICs. Commercial and industrial properties in areas that have City-owned UICs are currently prohibited from discharging runoff from other than driveway approaches and sidewalks to City-owned UICs and many have their own private UICs that receive the runoff from their site.

During field surveys, City staff completed a checklist for each property that was designed to identify properties that carry a risk of draining polluted runoff or other illicit discharges to City-owned UICs. The checklist template is included in this assessment as Appendix A. The ten properties that were considered to pose a high risk to City-owned UICs were further evaluated by the City’s stormwater business inspection program coordinator, who also leads the City’s illicit discharge response.

It was noted that six of the “high risk” properties are gas stations. While gas stations often historically posed a risk to groundwater due to leaking underground storage tanks, staff concluded that none of the stations pose a high risk to City-owned UICs. This is because fluids from under the canopy are required to drain to an oil/water separator and a close-ended tank that is regularly pumped. The only above-ground tanks observed contained propane, which rapidly becomes a gas at atmospheric pressure.

Four additional properties identified as “high risk” by the initial surveyors were judged to not present such risk. Two businesses were found to conduct their activities inside buildings, and customer parking spaces (16 or less at both properties) constitute the portion of each site that likely drains to the public right-of-way. One of the two properties is under new ownership since the 2009 survey and materials previously stored outside have been removed and proper housekeeping practices are being used. An additional property does not drain to the public right of way in the UIC area—rather it drains to an open ditch that eventually leads to the City’s piped stormwater system, which is permitted under DEQ’s NPDES program. The final property has an asphalt berm that prevents fluids from cars parked at the facility from draining to the City’s UICs.

Over the life of the WPCF permit, the City will continue to evaluate ways to protect groundwater from spills and illicit discharges that originate on private commercial and industrial property. The UIC Management Plan describes a plan to extend the business inspection program created to comply with the City’s NPDES stormwater permit to the UIC area. Additionally, the City has commissioned a risk assessment to determine which best management practices (BMPs) are most suited to minimize the risk from spills associated with traffic accidents. A study with similar focus, conducted by the City of Portland’s Water Bureau (CH2M-Hill, 1993), provides a model for such analysis. The City of Gresham’s assessment and anticipated timeline for follow-up is summarized in the UIC Management Plan, and the conclusions will be reported in one or more annual reports.

Permit text: B.1.g

“By the end of the fifth year of the permit term, you must update the system-wide assessment to reflect any changes that have occurred and submit a revised system-wide assessment to us...”

Response B.1.g

The City will evaluate any new information relevant to the system-wide assessment and revise the current submittal as appropriate in the fifth year of the permit term.

References

1. Kennedy/Jenks, 2009. Compilation and Evaluation of Existing Stormwater Quality Data from Oregon, 28 p.
2. USGS, 2008. Estimated depth to ground water and configuration of the water table in the Portland, Oregon area. U.S. Geological Survey Scientific Investigations Report 2008–5059, 40 p.
3. GSI, Inc., 2012a. Phase I UIC Evaluation Prepared for City of Gresham, 46 p.
4. GSI, Inc., 2011. Pollutant Fate and Transport Model Results in Support of the City of Gresham UIC WPCF Permit – Proposed EDLs, 65 p.
5. DEQ. 2012. City of Gresham WPCF Permit Application Update—Proposed Alternate EDLs. Letter from Bill Mason of DEQ to Steve Fancher of City of Gresham. February 13, 2012.
6. GSI Inc., 2012b. Determination of Waste Management Areas for UICs by Numerical Simulation of Pollutant Fate and Transport, City of Gresham, Oregon.
7. CH2M-Hill, 1993. Interim Transportation Corridor Technical Memo, prepared for the Portland Water Bureau, 29 p.

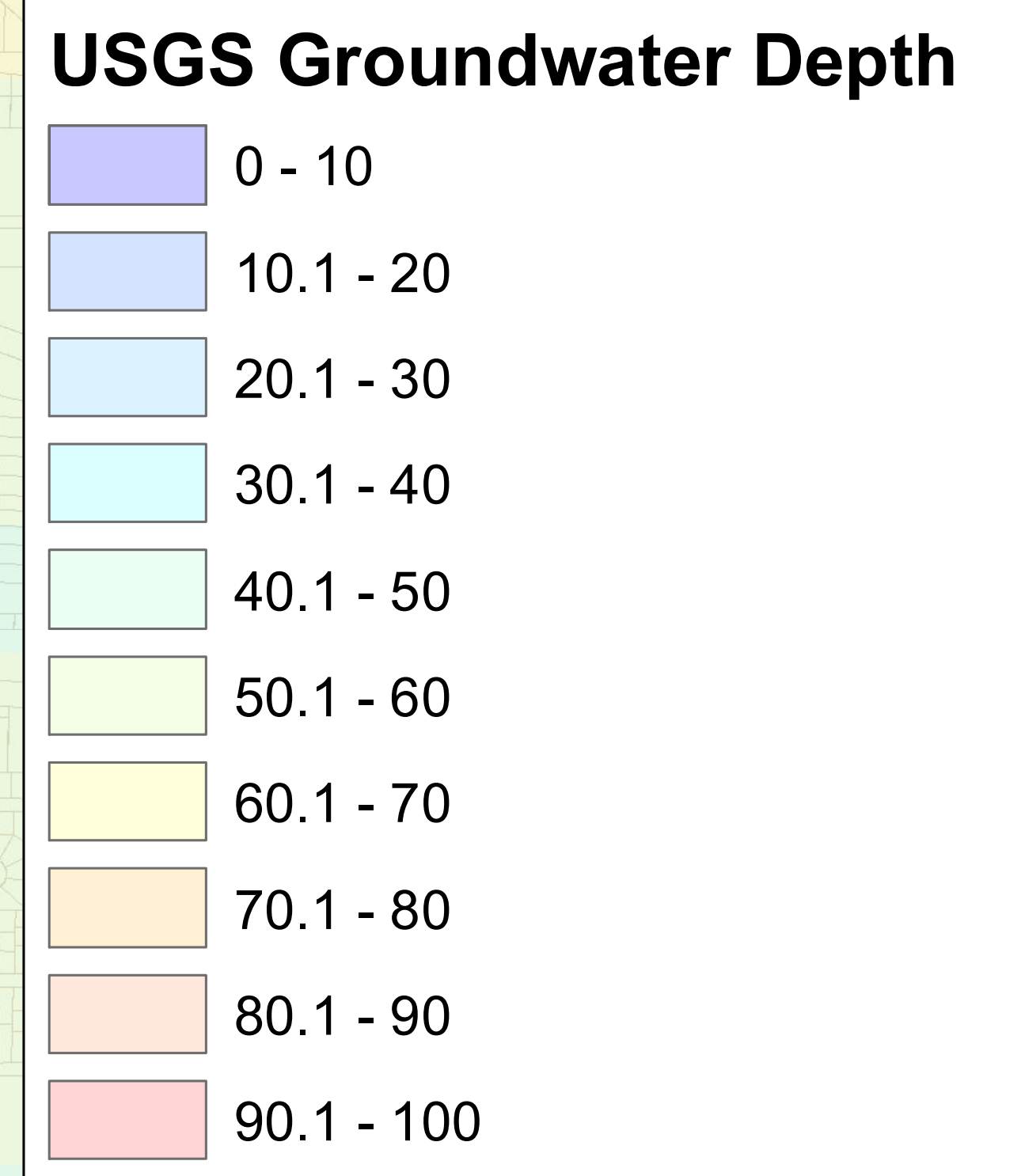
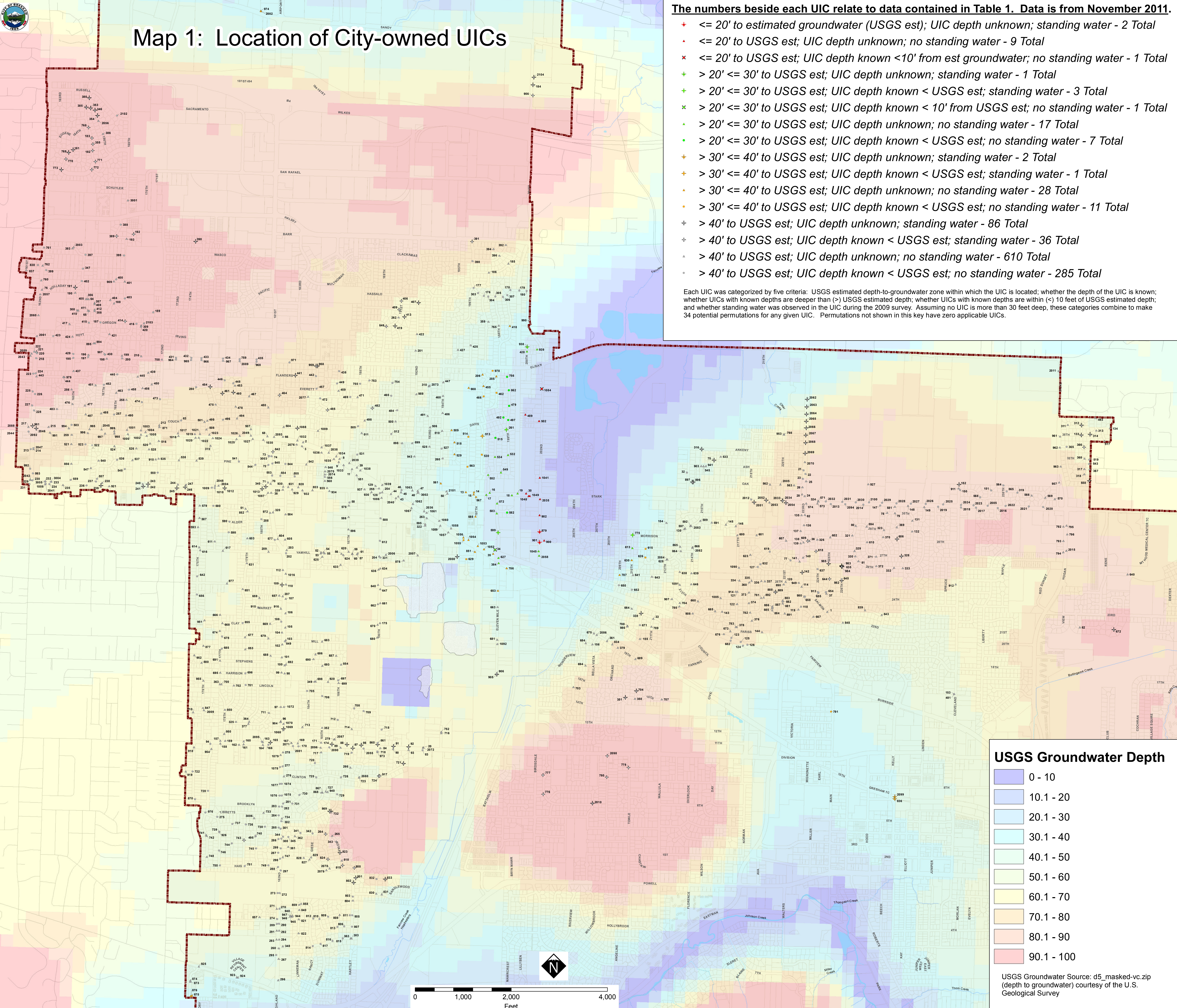


Map 1: Location of City-owned UICs

The numbers beside each UIC relate to data contained in Table 1. Data is from November 2011.

- ≤ 20' to estimated groundwater (USGS est); UIC depth unknown; standing water - 2 Total
- ▲ ≤ 20' to USGS est; UIC depth unknown; no standing water - 9 Total
- ✖ ≤ 20' to USGS est; UIC depth known < 10' from est groundwater; no standing water - 1 Total
- ⊕ > 20' ≤ 30' to USGS est; UIC depth unknown; standing water - 1 Total
- ⊕ > 20' ≤ 30' to USGS est; UIC depth known < USGS est; standing water - 3 Total
- ✖ > 20' ≤ 30' to USGS est; UIC depth known < 10' from USGS est; no standing water - 1 Total
- ▲ > 20' ≤ 30' to USGS est; UIC depth unknown; no standing water - 17 Total
- > 20' ≤ 30' to USGS est; UIC depth known < USGS est; no standing water - 7 Total
- ⊕ > 30' ≤ 40' to USGS est; UIC depth unknown; standing water - 2 Total
- ⊕ > 30' ≤ 40' to USGS est; UIC depth known < USGS est; standing water - 1 Total
- ▲ > 30' ≤ 40' to USGS est; UIC depth unknown; no standing water - 28 Total
- > 30' ≤ 40' to USGS est; UIC depth known < USGS est; no standing water - 11 Total
- ⊕ > 40' to USGS est; UIC depth unknown; standing water - 86 Total
- ⊕ > 40' to USGS est; UIC depth known < USGS est; standing water - 36 Total
- ▲ > 40' to USGS est; UIC depth unknown; no standing water - 610 Total
- > 40' to USGS est; UIC depth known < USGS est; no standing water - 285 Total

Each UIC was categorized by five criteria: USGS estimated depth-to-groundwater zone within which the UIC is located; whether the depth of the UIC is known; whether UICs with known depths are deeper than (>) USGS estimated depth; whether UICs with known depths are within (<) 10 feet of USGS estimated depth; and whether standing water was observed in the UIC during the 2009 survey. Assuming no UIC is more than 30 feet deep, these categories combined to make 34 potential permutations for any given UIC. Permutations not shown in this key have zero applicable UICs.



USGS Groundwater Source: d5_masked-vc.zip (depth to groundwater) courtesy of the U.S. Geological Survey



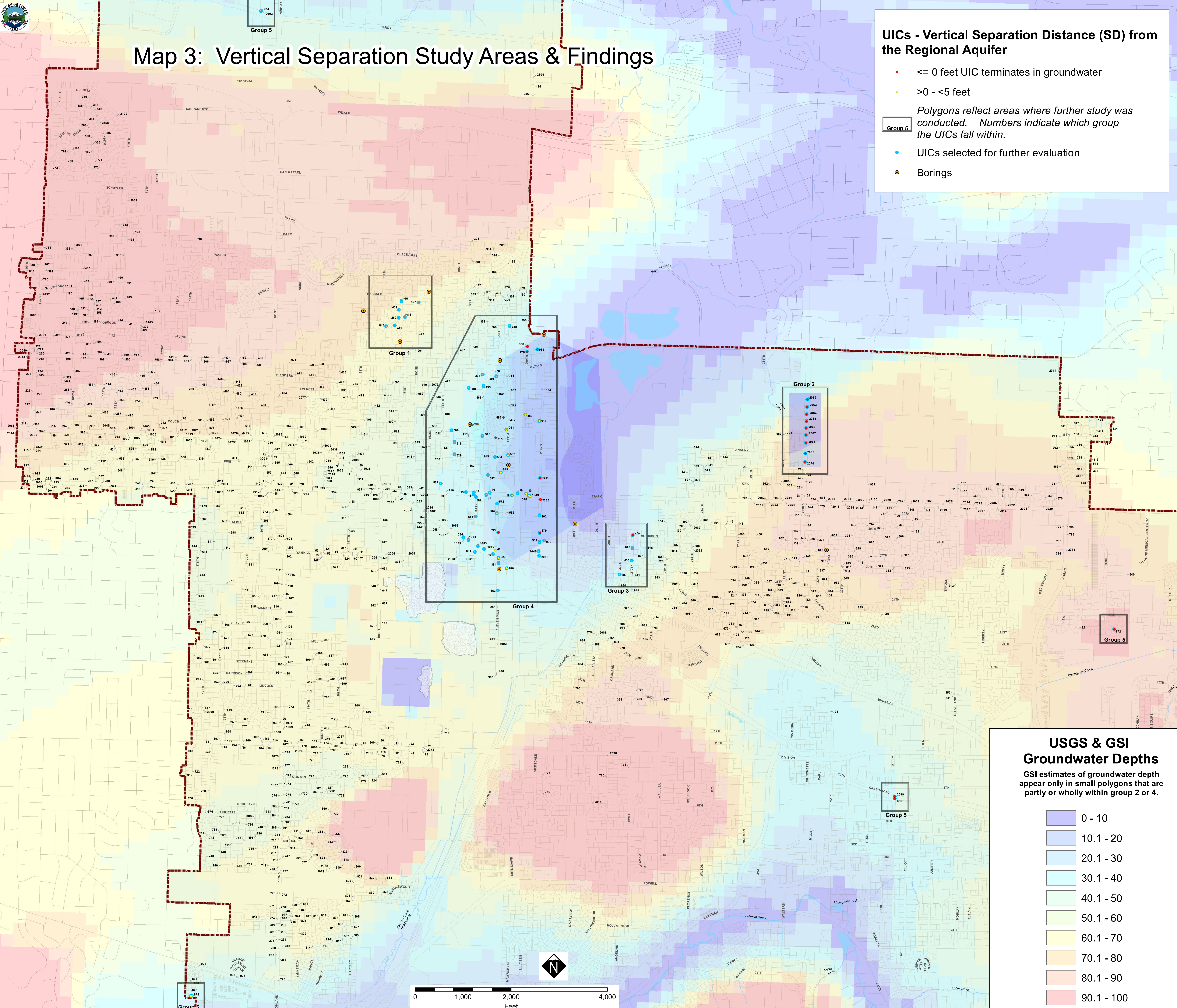
Map 3: Vertical Separation Study Areas & Findings

UICs - Vertical Separation Distance (SD) from the Regional Aquifer

- ◆ ≤ 0 feet UIC terminates in groundwater
- ◆ > 0 - < 5 feet

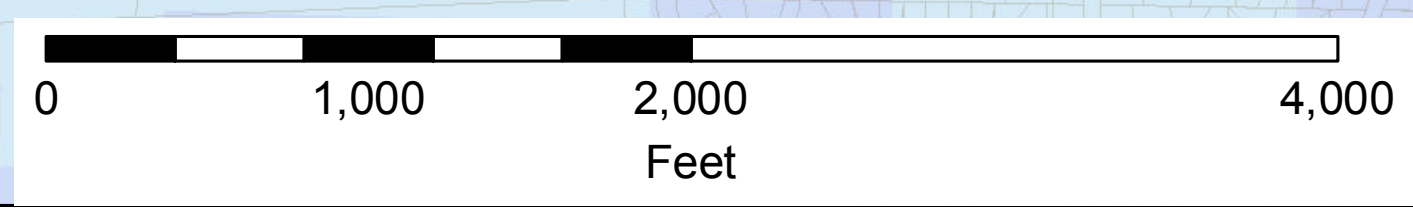
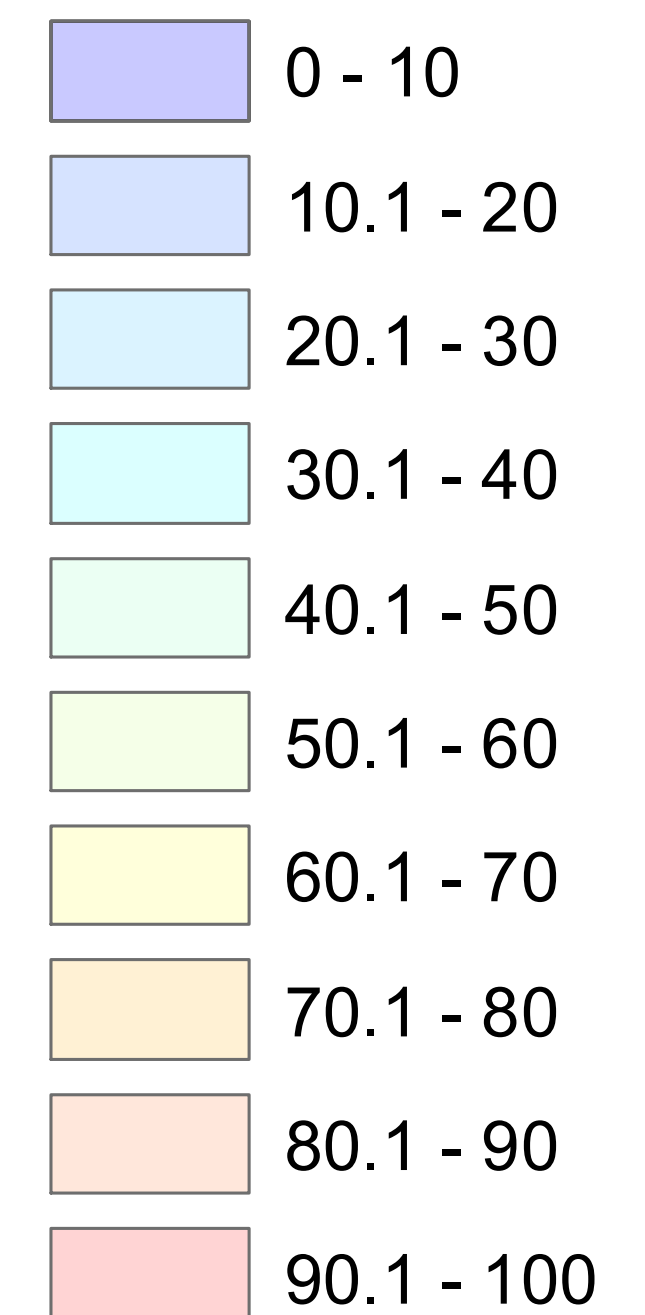
Polygons reflect areas where further study was conducted. Numbers indicate which group the UICs fall within.

- Group 5
- UICs selected for further evaluation
- Borings



USGS & GSI Groundwater Depths

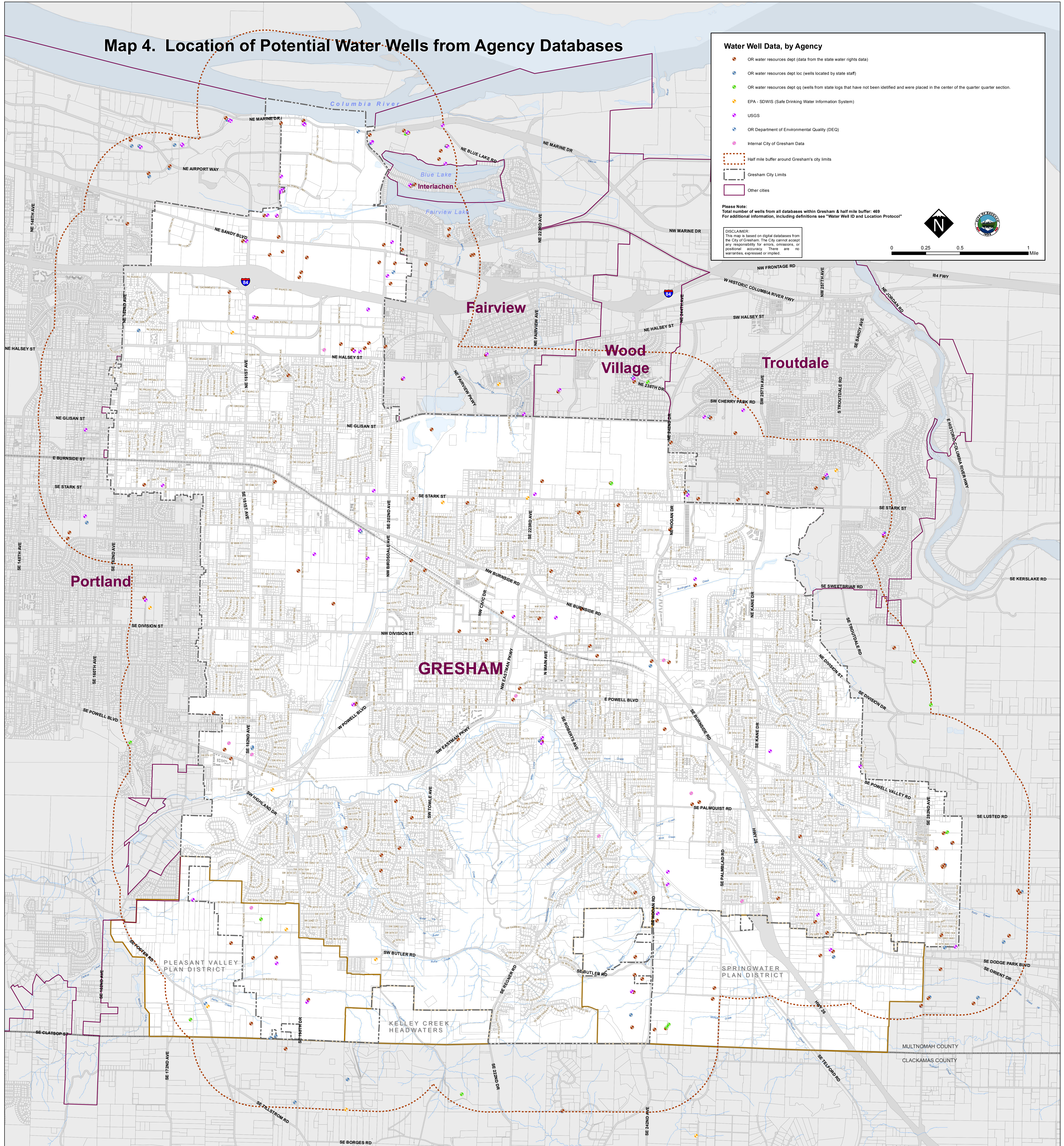
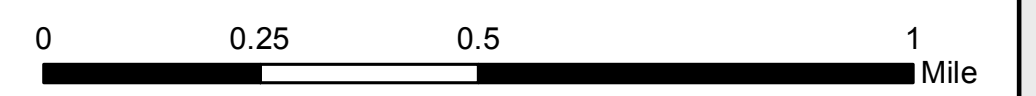
GSI estimates of groundwater depth appear only in small polygons that are partly or wholly within group 2 or 4.



Map 4. Location of Potential Water Wells from Agency Databases

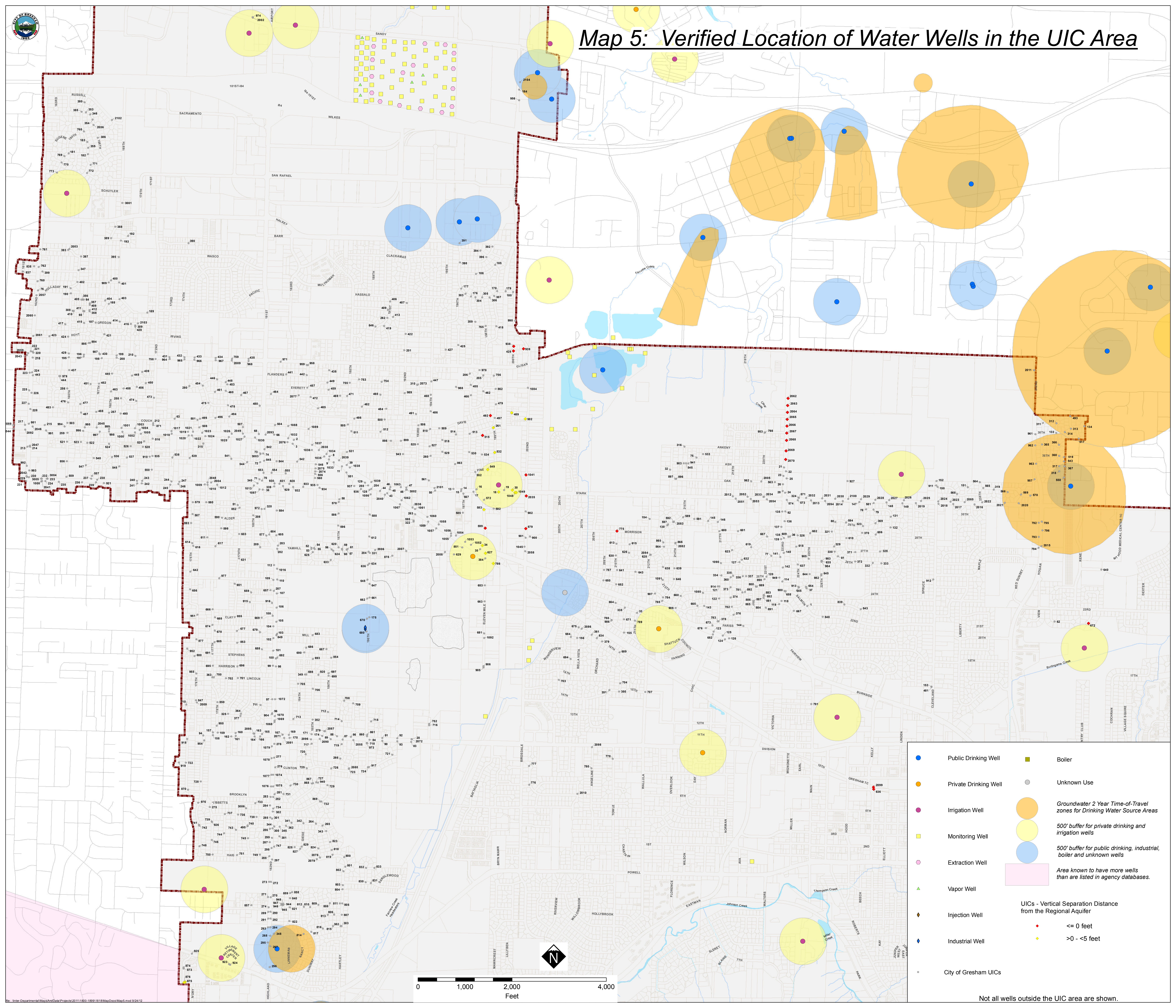
Water Well Data, by Agency

- OR water resources dept (data from the state water rights data)
 - OR water resources dept loc (wells located by state staff)
 - OR water resources dept qq (wells from state logs that have not been identified and were placed in the center of the quarter quarter section).
 - EPA - SDWIS (Safe Drinking Water Information System)
 - USGS
 - OR Department of Environmental Quality (DEQ)
 - Internal City of Gresham Data
- Half mile buffer around Gresham's city limits
 Gresham City Limits
 Other cities
- Please Note:**
 Total number of wells from all databases within Gresham & half mile buffer: 469
 For additional information, including definitions see "Water Well ID and Location Protocol"
- DISCLAIMER:**
 This map is based on digital databases from the City of Gresham. The City cannot accept any responsibility for errors, omissions, or positional accuracy. There are no warranties, expressed or implied.

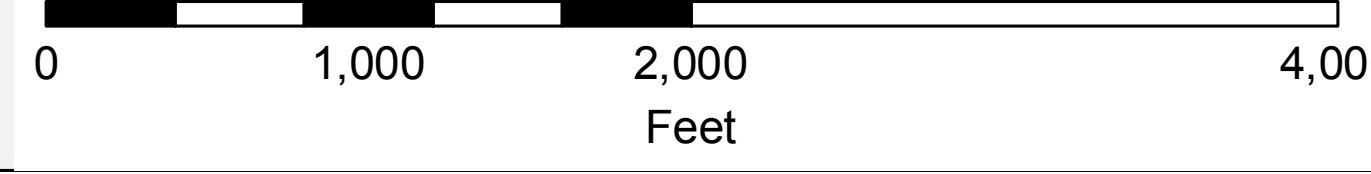




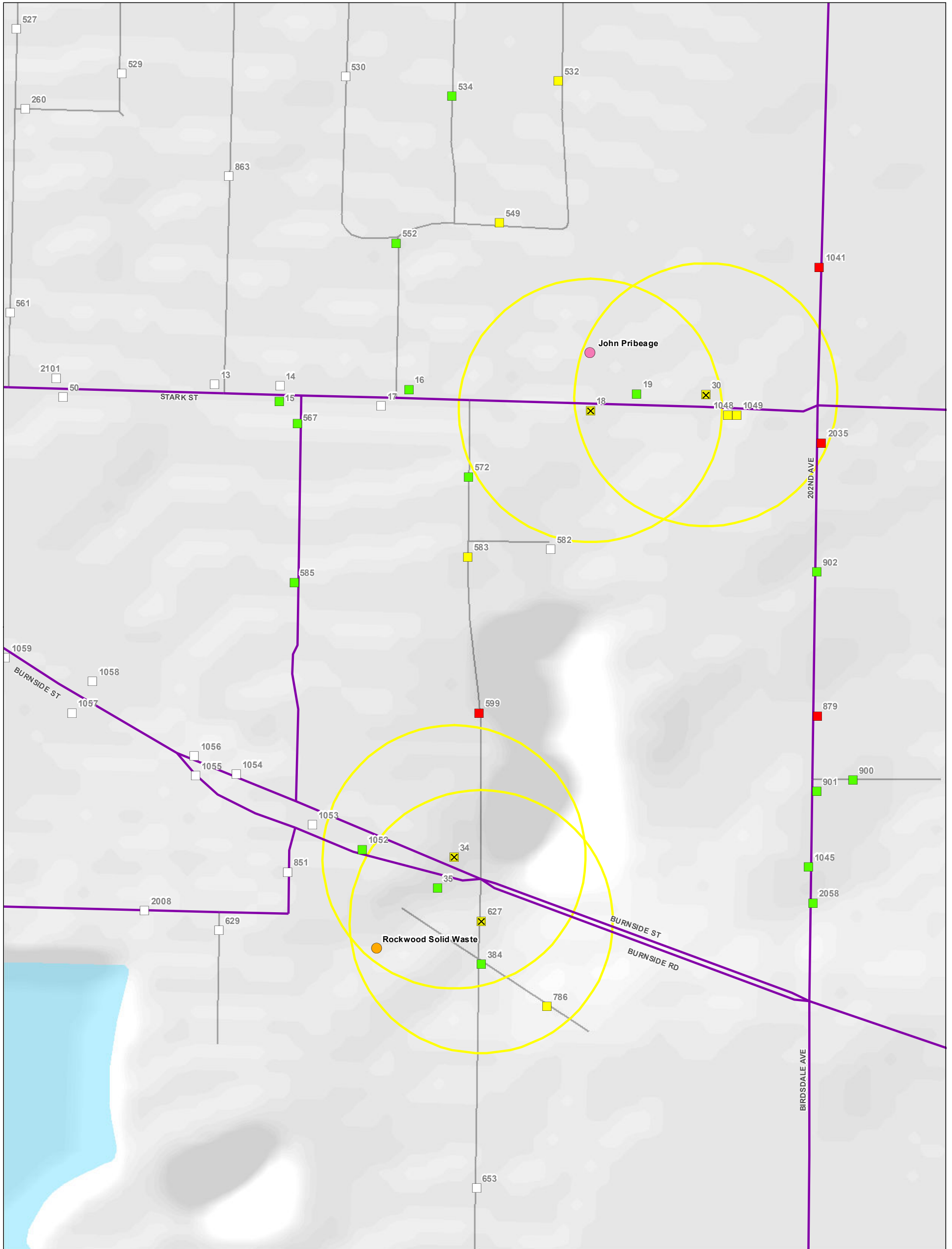
Map 5: Verified Location of Water Wells in the UIC Area



	Public Drinking Well		Boiler
	Private Drinking Well		Unknown Use
	Irrigation Well		Groundwater 2 Year Time-of-Travel zones for Drinking Water Source Areas
	Monitoring Well		500' buffer for private drinking and irrigation wells
	Extraction Well		500' buffer for public drinking, industrial, boiler and unknown wells
	Vapor Well		Area known to have more wells than are listed in agency databases.
	Injection Well	UICs - Vertical Separation Distance from the Regional Aquifer	
	Industrial Well		<= 0 feet
	City of Gresham UICs		> 0 - <5 feet



Not all wells outside the UIC area are shown.



LEGEND

- UICs Identified for Permit
 - Required Retrofit or Decommissioning
- UICs - Separation Distance from the Regional Aquifer**
 - ≤ 0 feet
 - >0 <5 feet
 - ≥5 <10 feet
 - ≥10 feet

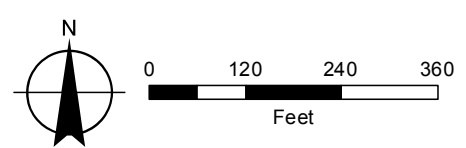
- Water Well Locations**
 - Drinking Private
 - Irrigation
- Waste Management Areas (shown only for UICs <5 vertical feet of separation)

- Road Segments with ≥1,000 Trips Per Day
- Road Segments with <1,000 Trips Per Day

NOTE:
 1) Separation distance is less than 5 vertical feet and UIC is within a waste management area.

FIGURE 1
UICs Identified for Permit - Required Retrofit or Decommissioning

MAP NOTES:
 Date: September 21, 2012
 Data Sources: City of Gresham, METRO RLIS, OGIC



Map ID	ID	Township	Range	Section	Quart Section	Latitude	Longitude	Tax Lot	Address	Zip	RM	Depth Bottom	Standing Water	Landuse	Trips	Horizontal	Panel	GRIS Rank	OSI Evaluation	VSD Loss F	VSD 0' to 5'	Is WMA	
1	3153-F-044	1n	3e	03	NW	45.5128553260	-122.4316356890	15403BC-01000	75 NW 23RD ST	97230	348.88	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0		
2	3049-W-093	1n	3e	31	SW	45.5136149170	-122.4174014100	1N8E12CC-01000	18131 E BURMANDE ST	97233	219.26	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
3	3049-W-092	1n	3e	32	SW	45.5133018100	-122.4174014100	1N8E12CC-01000	18131 E BURMANDE ST	97233	219.26	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
8	3049-W-046	1n	3e	32	SW	45.5120950220	-122.4174518800	1N8E12CC-01000	18145 28027 E BURMANDE ST	97233	248.76	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
9	3049-W-047	1n	3e	32	SW	45.5120950220	-122.4174518800	1N8E12CC-01000	18145 28027 E BURMANDE ST	97233	248.76	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
11	3049-W-034	1n	3e	32	SW	45.5120950220	-122.4174518800	1N8E12CC-01000	18145 28027 E BURMANDE ST	97233	248.76	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
13	3050-W-093	1n	3e	32	SE	45.5190634560	-122.4011830000	1N8E30D-01000	425 SE 189TH AVE	97233	248.14	0.00	0	MBES	Great	Residential	Panel9	GR15-213	X	0.0	0.0		
14	3050-W-093	1n	3e	32	SE	45.5190634560	-122.4011830000	1N8E30D-01000	404 SE 189TH AVE	97233	248.76	0.00	0	COMMERCIAL	Great	Minor Arterial	Over	GR15-212	X	0.0	0.0		
15	3150-W-028	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	18905 SE STARK ST	97233	248.29	0.00	0	COMMERCIAL	Great	Minor Arterial				0.0	0.0		
16	3050-W-047	1n	3e	32	SE	45.5190634560	-122.4011830000	1N8E30D-01000	18905 SE STARK ST	97233	248.29	0.00	0	COMMERCIAL	Great	Minor Arterial	Panel7	GR15-149	X	0.0	0.0		
17	3150-F-033	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	18905 SE STARK ST	97233	248.29	0.00	0	COMMERCIAL	Great	Minor Arterial				0.0	0.0		
18	3150-F-034	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	18905 SE STARK ST	97233	248.29	0.00	0	COMMERCIAL	Great	Minor Arterial				0.0	0.0	2.1	X
19	3050-F-014	1n	3e	32	SE	45.5190634560	-122.4011830000	1N8E30D-01000	18905 SE STARK ST	97233	248.29	0.00	0	COMMERCIAL	Great	Minor Arterial				0.0	0.0		
20	3150-W-096	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	18905 SE STARK ST	97233	248.29	0.00	0	COMMERCIAL	Great	Minor Arterial	Panel2	GR15-034	X	0.0	0.0		
21	3053-F-012	1n	3e	34	SW	45.5190634560	-122.4011830000	1N8E30D-01000	22222 SE ASH ST	97233	248.29	19.90	0.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GR15-333	X	0.0	0.0	
22	3053-F-023	1n	3e	34	SW	45.5190634560	-122.4011830000	1N8E30D-01000	22222 SE ASH ST	97233	248.29	19.90	0.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GR15-333	X	0.0	0.0	
23	3053-F-022	1n	3e	34	SW	45.5190634560	-122.4011830000	1N8E30D-01000	22222 SE ASH ST	97233	248.29	19.90	0.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GR15-333	X	0.0	0.0	
24	3053-F-016	1n	3e	34	SW	45.5190634560	-122.4011830000	1N8E30D-01000	22222 SE ASH ST	97233	248.29	19.90	0.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GR15-333	X	0.0	0.0	
25	3053-F-020	1n	3e	34	SW	45.5190634560	-122.4011830000	1N8E30D-01000	22222 SE ASH ST	97233	248.29	19.90	0.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GR15-333	X	0.0	0.0	
26	3053-F-019	1n	3e	34	SW	45.5190634560	-122.4011830000	1N8E30D-01000	22222 SE ASH ST	97233	248.29	19.90	0.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GR15-333	X	0.0	0.0	
28	3053-F-017	1n	3e	34	SW	45.5190634560	-122.4011830000	1N8E30D-01000	22222 SE ASH ST	97233	248.29	19.90	0.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GR15-333	X	0.0	0.0	
30	3050-F-010	1n	3e	32	SE	45.5190634560	-122.4011830000	1N8E30D-01000	2011 SE STARK ST	97233	245.55	0.00	0	COMMERCIAL	Great	Minor Arterial	Panel3	GR15-037	X	0.0	0.0	3.1	X
31	3150-F-013	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	2011 SE STARK ST	97233	245.55	0.00	0	COMMERCIAL	Great	Minor Arterial				0.0	0.0		
33	3151-F-049	1n	3e	04	NW	45.5127292190	-122.4457302100	15E04HD-01000	1414 SE 211th Ave	97233	316.49	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0		
34	3150-F-013	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	1919 SE BURMANDE ST	97233	266.29	21.20	0.00	0	UNDEVELOPED	Great	Residential	Over	GR15-197	X	0.0	0.0	X
35	3150-F-013	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	1919 SE BURMANDE ST	97233	266.29	21.20	0.00	0	UNDEVELOPED	Great	Residential	Over	GR15-197	X	0.0	0.0	X
36	3153-F-027	1n	3e	03	NW	45.5166769970	-122.4332056000	15E03BB-07700	22313 SE MORANDE ST	97233	306.60	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0		
37	3153-F-028	1n	3e	03	NW	45.5166769970	-122.4332056000	15E03BB-07700	22313 SE MORANDE ST	97233	306.60	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0		
38	3153-F-028	1n	3e	03	NW	45.5166769970	-122.4332056000	15E03BB-07700	22313 SE MORANDE ST	97233	306.60	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0		
39	3049-W-035	1n	3e	02	SW	45.5104375200	-122.4007935200	1N8E32D-03200	1801 E Burnside St	97233	247.79	0.00	0	COMMERCIAL	Less	Residential	Panel10	GR15-206		0.0	0.0		
43	3149-W-029	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
44	3149-W-021	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
45	3149-W-019	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
46	3049-W-008	1n	3e	32	SW	45.5190634560	-122.4011830000	1N8E30D-01000	1919 SE STARK ST	97233	248.29	19.50	0.00	0	COMMERCIAL	Great	Residential	Over	GR15-253		0.0	0.0	
47	3050-W-093	1n	3e	32	SE	45.5190634560	-122.4011830000	1N8E30D-01000	1919 SE STARK ST	97233	248.29	19.50	0.00	0	COMMERCIAL	Great	Residential	Over	GR15-253		0.0	0.0	
48	3150-W-021	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	1919 SE STARK ST	97233	248.29	19.50	0.00	0	COMMERCIAL	Great	Residential	Over	GR15-253		0.0	0.0	
50	3150-W-022	1n	3e	05	NE	45.5190634560	-122.4011830000	1N8E30D-01000	1919 SE STARK ST	97233	248.29	19.50	0.00	0	COMMERCIAL	Great	Residential	Over	GR15-253		0.0	0.0	
51	3149-W-028	1n	3e	05	NE	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential				0.0	0.0		
52	3149-W-035	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
53	3149-W-036	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
54	3149-W-036	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
55	3149-W-039	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
56	3149-W-047	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
57	3149-W-047	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
58	3149-W-045	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
59	3149-W-045	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
60	3149-W-045	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
61	3149-W-045	1n	3e	05	NW	45.5185346460	-122.4665998300	15E05BA-06000	19312 SE STARK ST	97233	250.00	0.00	0	COMMERCIAL	Great	Residential	Panel4	GR15-027		0.0	0.0		
62	3153-W-040	1n	3e	02	NW	45.5232946030	-122.4111750000	15E02BC-06000	2120 NE Francis Dr	97230	325.77	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0		
63	3049-W-022	1n	3e	31	SW	45.51272921																	

Map ID	ID	Township	Range	Section	Quart Section	Latitude	Longitude	Tax Lot	Address	Zip	RIM	Depth Bottom	Standing Water	Landuse	Trips	Functional	Panel	GRIS Rank	CSI Evaluation	VSD Loss of	VSD 0 to 5'	In WMA
502	3098-W057	In	3e	31	SE	45.2228348850	-122.4622289880	IN3E31C0-00700	424 N 122nd Ave	97220	25.000	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
503	3097-W041	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	422 N 122nd Ave	97220	25.000	0.00	0	UNDEVELOPED	Less	Residential	Panel 2	GRIS-075	X	0.0	0.0	
504	3097-W040	In	3e	31	SW	45.2188183900	-122.4930309200	IN3E31C0-00700	165 NE 195th Ave	97223	26.290	18.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
505	3098-W048	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	1635 NE Couch St	97220	24.130	0.00	0	UNDEVELOPED	Less	Residential				0.0	0.0	
506	3098-W049	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	2026 NE Couch St	97220	24.440	18.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
507	3098-W050	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	43 NE 194th Ave	97220	24.005	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
508	3098-W051	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	31 NE 194th Ave	97220	24.005	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
509	3098-W052	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	1743 NE Couch St	97220	24.390	0.00	0	RESIDENTIAL	Less	Residential	Panel 3	GRIS-035	X	0.0	0.0	
510	3098-W053	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	21 NE 194th Ave	97220	24.130	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
511	3098-W054	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	1813 NE Couch St	97220	24.390	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
512	3098-W055	In	3e	31	SW	45.2141183600	-122.4673417000	IN3E31C0-00600	1901 NE Couch St	97220	24.130	18.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
513	3098-W056	In	3e	31	SW	45.2141183600	-122.4673417000	IN3E31C0-00600	25 NE 193th Ave	97220	23.550	12.00	15.3	RESIDENTIAL	Less	Residential	Panel 5	GRIS-085	X	0.0	0.0	
514	3098-W057	In	3e	31	SW	45.2141183600	-122.4673417000	IN3E31C0-00600	14 NE 193th Ave	97220	23.550	12.00	15.3	RESIDENTIAL	Less	Residential	Over	GRIS-287		0.0	0.0	
515	3098-W058	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	22 NE 194th Ave	97220	23.940	18.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
516	3098-W059	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	15 NE 194th Ave	97220	23.550	12.00	15.3	RESIDENTIAL	Less	Residential				0.0	0.0	
517	3098-W060	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	1731 NE Country Club Ave	97220	24.720	0.00	0	UNDEVELOPED	Less	Community	Over	GRIS-322		0.0	0.0	
518	3098-W061	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	15 SE 195th Ave	97223	24.174	0.00	0	RESIDENTIAL	Less	Residential	Panel 6	GRIS-112	X	0.0	0.0	
519	3098-W062	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	2026 NE Couch St	97220	24.130	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
520	3097-W050	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	71 SE 171st Ave	97223	25.400	0.00	0	RESIDENTIAL	Less	Residential	Over	GRIS-300		0.0	0.0	
521	3097-W049	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	68 SE 165th Ave	97223	26.130	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
522	3097-W048	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	112 NE 193rd Ave	97223	25.700	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
523	3097-W047	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	16608 SE Ankeny St	97223	25.727	17.00	0	RESIDENTIAL	Less	Residential	Panel 4	GRIS-074		0.0	0.0	
524	3097-W046	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	16812 SE Ankeny St	97223	25.634	17.00	0	RESIDENTIAL	Less	Residential	Over	GRIS-348		0.0	0.0	
525	3097-W045	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	16712 SE Ankeny St	97223	25.634	17.00	0	RESIDENTIAL	Less	Residential	Panel 4	GRIS-075		0.0	0.0	
526	3097-W044	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	16078 SE Ankeny St	97223	25.630	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
527	3098-W063	In	3e	31	SE	45.2133534000	-122.4633007100	IN3E31C0-00700	41 NE 194th Ave	97223	24.130	18.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
528	3097-W043	In	3e	31	SW	45.2133534000	-122.4633007100	IN3E31C0-00700	1706 SE Ankeny St	97223	25.230	18.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
529	3096-W027	In	3e	32	SE	45.2133534000	-122.4633007100	IN3E31C0-00800	105 SE 195th Ave	97223	24.430	0.00	0	RESIDENTIAL	Less	Residential	Panel 7	GRIS-137	X	0.0	0.0	
530	3096-W026	In	3e	32	SE	45.2133534000	-122.4633007100	IN3E31C0-00800	115 SE 197th Ave	97223	24.184	19.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
531	3096-W025	In	3e	32	SE	45.2133534000	-122.4633007100	IN3E31C0-00800	105 SE 197th Ave	97223	24.184	19.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
532	3096-W024	In	3e	32	SE	45.2133534000	-122.4633007100	IN3E31C0-00800	105 SE 197th Ave	97223	24.184	19.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
533	3050-F-023	In	3e	32	SE	45.2133534000	-122.4633007100	IN3E31C0-00800	101 SE 199th Ave	97223	23.940	0.00	0	RESIDENTIAL	Less	Residential				0.0	2.3	
534	3052-F-086	In	3e	32	SE	45.2133534000	-122.4633007100	IN3E31C0-00800	148 SE 194th Ave	97220	26.120	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
535	3050-F-024	In	3e	32	SE	45.2133534000	-122.4633007100	IN3E31C0-00800	101 SE 199th Ave	97223	23.940	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
536	3047-W-027	In	3e	31	SW	45.2067832900	-122.4861897400	IN3E31C0-00801	276 SE 172nd Ave	97223	25.697	0.00	0	RESIDENTIAL	Great	Community	Over	GRIS-282	X	0.0	0.0	
537	3047-W-045	In	3e	31	SW	45.2055234300	-122.4805337700	IN3E31C0-11300	16078 SE Pine St	97223	25.492	20.00	0	RESIDENTIAL	Less	Residential	Over	GRIS-330		0.0	0.0	
538	3047-W-046	In	3e	31	SW	45.2055234300	-122.4805337700	IN3E31C0-11300	16078 SE Pine St	97223	25.492	20.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
539	3048-W-013	In	3e	31	SE	45.2051223100	-122.4845274100	IN3E31C0-00200	1734 SE Pine St	97223	25.685	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
538	3048-W-012	In	3e	31	SE	45.2051223100	-122.4845274100	IN3E31C0-00200	1734 SE Pine St	97223	25.685	0.00	0	RESIDENTIAL	Less	Residential	Panel 8	GRIS-147		0.0	0.0	
540	3047-W-012	In	3e	31	SW	45.2038177400	-122.4830911900	IN3E31C0-00600	1734 SE Pine St	97223	25.685	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
541	3048-W-047	In	3e	31	SE	45.2051223100	-122.4845274100	IN3E31C0-00200	1734 SE Pine St	97223	25.685	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
542	3049-W-036	In	3e	32	SW	45.2055234300	-122.4791096700	IN3E31C0-00400	1800 SE Pine St	97223	24.685	20.00	0	RESIDENTIAL	Less	Residential	Panel 3	GRIS-046		0.0	0.0	
543	3050-F-028	In	3e	32	SE	45.2051223100	-122.4845274100	IN3E31C0-00200	101 SE 199th Ave	97223	23.940	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
544	3048-W-046	In	3e	31	SE	45.2051223100	-122.4845274100	IN3E31C0-00200	1734 SE Pine St	97223	24.540	18.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
545	3052-F-017	In	3e	32	SE	45.2022088000	-122.4749196700	IN3E31C0-00300	2147 SE Oak Street	97220	23.990	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
546	3049-W-029	In	3e	32	SW	45.2044175400	-122.4782146900	IN3E31C0-00300	1842 SE Pine St	97223	25.700	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
547	3047-W-019	In	3e	31	SW	45.2004474400	-122.4916710700	IN3E31C0-00600	16636 SE Oak St	97223	25.575	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
548	3047-W-028	In	3e	31	SW	45.2004474400	-122.4916710700	IN3E31C0-00600	185 SE 199th Ave	97223	25.138	20.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
549	3050-F-027	In	3e	32	SE	45.2051223100	-122.4845274100	IN3E31C0-00200	101 SE 199th Ave	97223	23.940	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
550	3047-W-026	In	3e	31	SW	45.2044175400	-122.4782146900	IN3E31C0-00300	1842 SE Pine St	97223	25.700	0.00	0	RESIDENTIAL	Less	Residential				0.0	0.0	
551	3049-W-025	In	3e	32	SW	45.2055234300	-122.4791096700	IN3E31C0-00400	1800 SE Pine St	97223	24.685	20.00	0	UNDEVELOPED	Less	Residential				0.0	0.0	
552	3052-F-021</																					

Map ID	ID	Township	Range	Section	Quarter Section	Latitude	Longitude	Tax Lot	Address	Zip	RIM	Depth Bottom	Standing Water	Landuse	Trips	Functional	Panel	GRTS Rank	GSI Evaluation	VSD less 0'	VSD 0' to 5'	In WMA	
989	3056-F062	1n	3e	32	SE	45.529388580	-122.40580818700	1N3E33C-04800	258 SE 123RD AVE	97230	239.43	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
990	3056-W079	1n	3e	32	NE	45.529388580	-122.40580818700	1N3E33C-04800	174 N 202ND	97204	312.29	13.33	0	RESIDENTIAL	Great	Collector	Panel 4	GRTS-031		0.0	0.0		
991	3047-W096	1n	3e	31	SW	45.52200528880	-122.40549595100	1N3E33C-04000	1800S SE BURROUSE ST	97233	267.38	0.00	0	MRES	Great	Community				0.0	0.0		
992	3046-W011	1n	2e	36	SE	45.51992415500	-122.40951718300	1N3E33C-01900	407 SE BURROUSE	97233	238.73	17.00	0	COMMERCIAL	Great	Minor Arterial				0.0	0.0		
993	3047-W087	1n	3e	31	SW	45.52056681200	-122.40953086100	1N3E33C-04000	408 W BURROUSE	97233	238.67	22.25	0	COMMERCIAL	Great	Minor Arterial	Panel 11	GRTS-264		0.0	0.0		
994	3047-W104	1n	3e	31	SW	45.52279511600	-122.40351931000	1N3E33C-00700	?	97233	266.30	0.00	0	RESIDENTIAL	Great	Community	Panel 5	GRTS-104		0.0	0.0		
995	3047-W099	1n	3e	31	SW	45.52239389000	-122.40348181000	1N3E33C-00900	1663 E BURROUSE	97233	262.21	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
996	3047-W101	1n	3e	31	SW	45.52201313000	-122.40307690000	1N3E33C-00900	1660 E BURROUSE	97233	262.86	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
997	3047-W101	1n	3e	31	SW	45.52202674300	-122.40308765000	1N3E33C-00300	1677 E BURROUSE ST	97233	259.84	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
998	3047-W102	1n	3e	31	SW	45.52202811300	-122.40308390000	1N3E33C-00500	1680 E BURROUSE ST	97233	259.71	0.00	0	RESIDENTIAL	Great	Community	Panel 2	GRTS-007		0.0	0.0		
999	3047-W103	1n	3e	31	SW	45.52212867000	-122.40308412000	1N3E33C-00300	1688 E BURROUSE	97233	259.33	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
1000	3047-W104	1n	3e	31	SW	45.52204482200	-122.40308784000	1N3E33C-00300	1690 E BURROUSE ST	97233	258.11	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
1001	3047-W105	1n	3e	31	SW	45.52224676600	-122.40308799000	1N3E33C-00900	?	97233	258.60	0.00	0	RESIDENTIAL	Great	Community	Panel 8	GRTS-179		0.0	0.0		
1002	3047-W106	1n	3e	31	SW	45.52203738000	-122.40307345000	1N3E33C-00300	1700 E BURROUSE ST	97233	257.86	0.00	0	RESIDENTIAL	Great	Community	Panel 6	GRTS-115		0.0	0.0		
1003	3047-W107	1n	3e	31	SW	45.52202676500	-122.40308782000	1N3E33C-00800	1701 E BURROUSE	97233	258.31	0.00	0	RESIDENTIAL	Great	Community	Panel 3	GRTS-051		0.0	0.0		
1004	3047-W108	1n	3e	31	SW	45.52217876000	-122.40307951000	1N3E33C-00400	1703 E BURROUSE	97233	258.72	0.00	0	UNDEVELOPED	Great	Community				0.0	0.0		
1005	3047-W109	1n	3e	31	SW	45.52218968000	-122.40307967000	1N3E33C-00300	1704 E BURROUSE	97233	258.67	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
1008	3147-W009	1n	3e	06	NW	45.51904815400	-122.40512941000	1S10E8B-12300	16246 STARBUCK ST	97233	255.45	21.58	0.00	COMMERCIAL	Great	Minor Arterial				0.0	0.0		
1009	3148-W053	1n	3e	06	NE	45.51906204000	-122.40317881000	1S10E8B-04000	?	97233	267.64	16.00	0	RESIDENTIAL	Great	Minor Arterial	Over	GRTS-294		0.0	0.0		
1010	3148-W054	1n	3e	06	NE	45.51906110700	-122.40317862000	1S10E8B-04000	17405 STARBUCK ST	97233	267.22	17.50	0.00	RESIDENTIAL	Great	Minor Arterial				0.0	0.0		
1012	3148-W055	1n	3e	06	NE	45.51906178000	-122.40317866000	1S10E8B-04000	17406 STARBUCK ST	97233	267.20	0.00	0	RESIDENTIAL	Great	Minor Arterial				0.0	0.0		
1013	3148-W057	1n	3e	06	NE	45.51906464000	-122.40317817000	1S10E8B-05000	18017 STARBUCK ST	97233	269.28	0.00	23	COMMERCIAL	Great	Minor Arterial	Panel 4	GRTS-052		0.0	0.0		
1016	3148-W059	1n	3e	06	NW	45.51912895000	-122.40317852000	1S10E8B-03800	18308 SE BURROUSE AVE	97233	252.58	0.00	0	RESIDENTIAL	Great	Minor Arterial				0.0	0.0		
1017	3048-W089	1n	3e	31	SE	45.52215004800	-122.40453380000	1N3E33C-09300	173-	97233	257.56	0.00	0	MRES	Great	Community	Panel 4	GRTS-083		0.0	0.0		
1018	3048-W090	1n	3e	31	SE	45.52209798000	-122.40453280000	1N3E33C-07700	1736 EAST BURROUSE ST	97233	256.90	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
1019	3048-W091	1n	3e	31	SE	45.52212781000	-122.40453120000	1N3E33C-09000	?	97233	255.36	0.00	0	MRES	Great	Community				0.0	0.0		
1020	3048-W092	1n	3e	31	SE	45.52209284200	-122.40453199000	1N3E33C-08000	17400 BURROUSE ST	97233	255.58	0.00	0	RESIDENTIAL	Great	Community	Panel 2	GRTS-039		0.0	0.0		
1021	3048-W093	1n	3e	31	SE	45.52214645800	-122.40453109000	1N3E33C-08800	?	97233	254.69	0.00	0	RESIDENTIAL	Great	Community	Panel 9	GRTS-211		0.0	0.0		
1022	3048-W094	1n	3e	31	SE	45.52217811900	-122.40453086000	1N3E33C-08600	17500 E BURROUSE ST	97233	254.67	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
1023	3048-W095	1n	3e	31	SE	45.52211029500	-122.40453119000	1N3E33C-06500	17605 E BURROUSE	97233	255.20	0.00	0	RESIDENTIAL	Great	Community	Over	GRTS-136		0.0	0.0		
1024	3048-W096	1n	3e	31	SE	45.52209192800	-122.40453084000	1N3E33C-01000	17606 E BURROUSE	97233	255.62	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
1025	3048-W097	1n	3e	31	SE	45.52214083100	-122.40453101000	1N3E33C-01000	17607 E BURROUSE	97233	255.04	0.00	0	RESIDENTIAL	Great	Community	Over	GRTS-389		0.0	0.0		
1026	3048-W098	1n	3e	31	SE	45.52208427600	-122.40453030000	1N3E33C-01300	17777 E BURROUSE	97233	255.34	0.00	0	UNDEVELOPED	Great	Community	Panel 11	GRTS-254		0.0	0.0		
1027	3048-W099	1n	3e	31	SE	45.52219431000	-122.40453061000	1N3E33C-01000	17900 E BURROUSE ST	97233	254.46	0.00	0	RESIDENTIAL	Great	Community				0.0	0.0		
1032	3048-W105	1n	3e	31	SW	45.52190456000	-122.40496831000	1N3E33C-01500	18245 E BURROUSE	97233	249.02	0.00	0	COMMERCIAL	Great	Bookend	Panel 9	GRTS-222		0.0	0.0		
1037	3048-W109	1n	3e	31	SE	45.52194310000	-122.40496831000	1N3E33C-01000	18246 E BURROUSE ST	97233	249.02	0.00	0	COMMERCIAL	Great	Bookend				0.0	0.0		
1038	3048-W102	1n	3e	31	SE	45.52194310000	-122.40496831000	1N3E33C-01000	18247 E BURROUSE	97233	249.02	0.00	0	COMMERCIAL	Great	Bookend				0.0	0.0		
1034	3048-W077	1n	3e	32	SW	45.52164693700	-122.41774311000	1N3E33C-01100	?	97233	246.64	0.00	0	COMMERCIAL	Great	Bookend				0.0	0.0		
1035	3048-W078	1n	3e	32	SW	45.52098116200	-122.41792587000	1N3E33C-07900	?	97233	249.26	0.00	0	COMMERCIAL	Great	Bookend	Panel 2	GRTS-034		0.0	0.0		
1036	3048-W079	1n	3e	32	SW	45.52123271000	-122.41792587000	1N3E33C-01100	18501 E BURROUSE ST	97233	249.26	0.00	0	COMMERCIAL	Great	Bookend				0.0	0.0		
1037	3048-W080	1n	3e	32	SW	45.52152160000	-122.41792587000	1N3E33C-01500	18545 E BURROUSE	97233	249.67	0.00	0	COMMERCIAL	Great	Bookend				0.0	0.0		
1038	3048-W081	1n	3e	32	SW	45.52186692700	-122.41792587000	1N3E33C-01200	18801 BURROUSE RD	97233	248.12	0.00	0	COMMERCIAL	Great	Bookend				0.0	0.0		
1039	3048-W082	1n	3e	32	SW	45.52186692700	-122.41792587000	1N3E33C-01200	18802 BURROUSE RD	97233	248.12	0.00	0	COMMERCIAL	Great	Bookend	Panel 7	GRTS-142		0.0	0.0		
1041	3050-F063	1n	3e	05	NE	45.52091660000	-122.40512941000	1S10E8B-01400	314 202ND	97233	243.31	0.00	0	RESIDENTIAL	Great	Collector				X	6.2	0.0	
1045	3150-F043	1n	3e	05	NE	45.51922176000	-122.40517017500	1S10E8B-01400	?	97230	257.22	0.00	0	COMMERCIAL	Great	Collector				X	0.0	0.0	
1046	3150-F044	1n	3e	05	NE	45.51922176000	-122.40517017500	1S10E8B-01400	?	97230	257.22	0.00	0	COMMERCIAL	Great	Collector				X	0.0	0.0	
1049	3150-F047	1n	3e	05	NE	45.51906171900	-122.40558957000	1S10E8B-00100	?	97233	246.20	0.00	0	COMMERCIAL	Great	Minor Arterial				X	2.7	0.0	
1052	3150-W050	1n	3e	05	NE	45.51906106800	-122.40596837000	1S10E8B-03700	2400 E BURROUSE ST	97233	260.60	0.00	0	UNDEVELOPED	Great	Bookend				X	0.0	0.0	
1053	3150-W051	1n	3e	05	NE	45.51906106800	-122.40596837000	1S10E8B-03700	2400 E BURROUSE ST	97233	260.60	0.00	0	UNDEVELOPED	Great	Bookend				X	0.0	0.0	
1054	3150-W052	1n	3e	05	NE	45.51906106800	-122.40596837000	1S10E8B-03700	2400 E BURROUSE ST	97233	260.60	0.00	0	UNDEVELOPED	Great	Bookend	Panel 6	GRTS-133		0.0	0.0		
1055	3150-W053	1n	3e	05	NE	45.51906106																	

Table 2. Criteria for Determining UICs to be Cleaned (C) and/or Tested (T)

Permu- tation #	USGS Depth	Standing H2O	Known Depth?	UIC Depth vs USGS Estimate	# UICs	Post-2011 Testing	Prelim # to C or T	Map Adds	Clean & Test	Test Only
1	≤ 20	Water	Known	Depth > USGS	0	0				
2				Depth < USGS	0	0				
3				Depth +10' > USGS	0	0				
4				Depth +10' < USGS	0	0				
5			Unknown		2	2	2		2	
6		Dry	Known	Depth > USGS	0	0				
7				Depth < USGS	0	0				
8				Depth +10' > USGS	1	1				
9				Depth +10' < USGS	0	0				
10			Unknown		9	9	9		9	
11	>20 ≤ 30	Water	Known	Depth > USGS	0	0				
12				Depth < USGS	3	3	3			3
13				Depth +10' > USGS	0	0				
14				Depth +10' < USGS	0	0				
15			Unknown		1	1	1		1	
16		Dry	Known	Depth > USGS	0	0				
17				Depth < USGS	7	7				
18				Depth +10' > USGS	1	1				
19				Depth +10' < USGS	0	0				
20			Unknown		17	17	17		17	
21	>30 ≤ 40	Water	Known	Depth +10' > USGS	0	0				
22				Depth +10' < USGS	1	1	1			1
23			Unknown		2	2	2		2	
24		Dry	Known	Depth +10' > USGS	0	0				
25				Depth +10' < USGS	11	11				
26			Unknown		28	28	28		28	
27	> 40	Water	Known	Depth +10' > USGS	36	38		4		4
28			Unknown		86	84		11	11	
29		Dry	Known	Depth +10' > USGS	285	285				
30			Unknown		610	610		2	2	
TOTAL					1100	1100	63	17	72	8

--"# UICs" data is from Nov 2011 GIS database (same as applicant review update to DEQ)

--"Post-2011 Testing" shows UIC status based on 2011 wet feet protocol pilot testing. Bottom depth became known for two UICs. Numbers in boldface are those that changed.

--"Preliminary # to C or T" includes any UIC in < 40' to USGS est. groundwater: that has unknown depth with or without water, or has known depth with water.

--"Map Adds" are UICs that are near UICs tested in 2011 that aren't in Preliminary # to C or T, and that are presumed in water, plus UICs that are questionable based on map review & info on location of TGA. These UICs are near Holladay green street project and on 223rd near Glisan, respectively

--"Clean & test" means UICs for which bottom depth is needed and groundwater assessment is desired

--"Test only" includes UICs with known bottom depth, suspected of being in saturated zone

--Cells with dots are not considered for cleaning or testing, since bottom depth is known and no standing water was observed in June 2009

Table 3. Vertical Separation Distance

UIC ID		UIC Details			Groundwater Levels			Seasonal High Groundwater	
Map ID	Unique GIS ID	UIC Rim Elevation (NAVD 88)	UIC Depth ¹ (feet bgs)	UIC Bottom Elevation (NAVD 88)	Depth to Groundwater Near UIC (feet bgs)	Regional Groundwater Elevation Near UIC (NAVD 88)	Data Source for Groundwater Level	Seasonal High Adjustment ³ (feet)	Separation Distance from Seasonal High GW (feet)
Group 1									
262	2949-W-028	222.1	10.2	211.9	8.6 ²	190.3	GSI Study, boring B-3	1.25	22.9 ⁴
406	2949-W-032	218.4	15.3	203.1	11.5 ²	190.3	GSI Study, boring B-4	1.25	14.1 ⁴
407	2950-W-033	215.8	13.9	202.0	9.2 ²	190.3	GSI Study, boring B-5	1.25	12.9 ⁴
409	2949-W-030	219.5	16.1	203.4	6.5 ²	190.3	GSI Study, boring B-6	1.25	14.4 ⁴
413	2949-W-029	219.7	17.3	202.5	8.4 ²	190.3	GSI Study, boring B-7	1.25	13.4 ⁴
419	2949-W-026	223.9	20.9	203.1	9.8 ²	190.3	GSI Study, boring B-8	1.25	14.0 ⁴
846	2949-W-042	225.5	23.3	202.2	9.7 ²	190.3	GSI Study, boring B-9	1.25	13.2 ⁴
Group 2									
2062	3053-F-009	245.3	13.65	231.7	5.40	239.9	GSI Study, Level in UIC	1.25	-7.0 ⁵
2063	3053-F-008	259.4	17.77	241.6	5.30	254.1	GSI Study, Level in UIC	1.25	-11.22 ⁵
2064	3053-F-007	272.9	17.15	255.8	8.30	264.6	GSI Study, Level in UIC	1.25	-7.60 ⁵
2065	3053-F-006	284.2	16.85	267.4	5.20	279.0	GSI Study, Level in UIC	1.25	-10.40 ⁵
2066	3053-F-005	293.6	15.50	278.1	5.10	288.5	GSI Study, Level in UIC	1.25	-9.15 ⁵
2067	3053-F-004	301.7	17.00	284.7	5.40	296.3	GSI Study, Level in UIC	1.25	-10.35 ⁵
2068	3053-F-003	308.4	16.25	292.2	9.40	299.0	GSI Study, Level in UIC	1.25	-5.60 ⁵
2069	3053-F-002	313.7	16.25	297.5	12.20	301.5	GSI Study, Level in UIC	1.25	-2.80 ⁵
2070	3053-F-001	316.9	16.50	300.4	14.90	302.0	GSI Study, Level in UIC	1.25	-0.35 ⁵
Group 3									
613	3151-F-029	NM	8.20	NM	28.43	NM	USGS (2008) GW Contours	5.9	17.28 ⁶
630	3151-F-035	NM	18.50	NM	33.42	NM	USGS (2008) GW Contours	5.9	11.97 ⁶
775	3151-F-030	NM	18.60	NM	9.60	NM	GSI Study, Level in UIC	1.25	-7.75 ⁵
787	3151-F-013	NM	21.00	NM	34.13	NM	USGS (2008) GW Contours	5.9	10.18 ⁶
Group 4									
13	3050-W-019	NM	16.45	NM	33.32	NM	USGS (2008) GW Contours	5.9	13.92 ⁶
14	3050-W-018	NM	12.75	NM	31.54	NM	USGS (2008) GW Contours	5.9	15.84 ⁶
15	3150-W-023	NM	18.80	NM	31.52	NM	USGS (2008) GW Contours	5.9	9.77 ⁶
16	3050-F-017	NM	16.45	NM	27.13	NM	USGS (2008) GW Contours	5.9	7.73 ⁶
17	3150-F-033	NM	14.75	NM	28.06	NM	USGS (2008) GW Contours	5.9	10.36 ⁶
18	3150-F-034	NM	19.40	NM	20.20	NM	GSI Study GW Contours	1.25	2.05 ⁷
19	3050-F-014	NM	13.60	NM	19.12	NM	GSI Study GW Contours	1.25	6.77 ⁷
30	3050-F-010	NM	15.35	NM	17.16	NM	GSI Study GW Contours	1.25	3.06 ⁷
35	3150-F-013	NM	21.00	NM	29.44	NM	USGS (2008) GW Contours	5.9	5.49 ⁶
205	3050-W-050	NM	19.42	NM	23.47	NM	GSI Study GW Contours	1.25	5.30 ⁷
206	3050-W-049	NM	11.30	NM	37.74	NM	USGS (2008) GW Contours	5.9	23.49 ⁶
261	3050-F-042	NM	18.50	NM	21.32	NM	GSI Study GW Contours	1.25	4.07 ⁷
384	3150-F-010	NM	15.95	NM	22.26	NM	GSI Study GW Contours	1.25	7.56 ⁷
418	2950-W-058	NM	12.08	NM	39.16	NM	USGS (2008) GW Contours	5.9	24.13 ⁶
428	2950-W-028	220.0	20.00	200.0	18.30	201.7	GSI Study GW Contours	1.25	-0.45 ⁵
455	3050-W-048	NM	18.58	NM	35.11	NM	USGS (2008) GW Contours	5.9	13.58 ⁶
489	3050-F-013	NM	18.10	NM	18.49	NM	GSI Study GW Contours	1.25	1.64 ⁷
502	3050-F-011	234.8	19.25	215.6	18.30	216.5	GSI Study GW Contours	1.25	0.30 ⁵
509	3050-W-037	NM	17.70	NM	40.57	NM	USGS (2008) GW Contours	5.9	19.92 ⁶
513	3050-W-040	NM	17.25	NM	29.25	NM	GSI Study GW Contours	1.25	13.25 ⁷
518	3050-W-038	NM	17.42	NM	38.16	NM	USGS (2008) GW Contours	5.9	17.80 ⁶
529	3050-W-027	NM	12.70	NM	37.29	NM	USGS (2008) GW Contours	5.9	21.64 ⁶
532	3050-F-023	NM	17.30	NM	18.33	NM	GSI Study GW Contours	1.25	2.28 ⁷
534	3050-F-024	NM	15.40	NM	21.80	NM	GSI Study GW Contours	1.25	7.65 ⁷
549	3050-F-022	NM	16.50	NM	18.91	NM	GSI Study GW Contours	1.25	3.66 ⁷
552	3050-F-021	NM	17.30	NM	22.84	NM	GSI Study GW Contours	1.25	6.79 ⁷
561	3050-W-020	NM	16.65	NM	39.54	NM	USGS (2008) GW Contours	5.9	19.94 ⁶
567	3150-W-025	NM	18.40	NM	30.95	NM	USGS (2008) GW Contours	5.9	9.60 ⁶



UIC ID		UIC Details			Groundwater Levels			Seasonal High Groundwater	
Map ID	Unique GIS ID	UIC Rim Elevation (NAVD 88)	UIC Depth ¹ (feet bgs)	UIC Bottom Elevation (NAVD 88)	Depth to Groundwater Near UIC (feet bgs)	Regional Groundwater Elevation Near UIC (NAVD 88)	Data Source for Groundwater Level	Seasonal High Adjustment ³ (feet)	Separation Distance from Seasonal High GW (feet)
572	3150-F-032	NM	18.10	NM	22.13	NM	GSI Study GW Contours	1.25	5.28 ⁷
583	3150-F-029	NM	19.70	NM	22.01	NM	This Study GW Contours	1.25	3.56 ⁷
585	3150-W-027	NM	19.15	NM	31.86	NM	USGS (2008) GW Contours	5.9	9.76 ⁶
599	3150-F-028	255.3	19.40	235.9	16.30	239.0	This Study, Level in UIC	1.25	-1.85 ⁵
627	3150-F-011	NM	20.35	NM	22.10	NM	This Study GW Contours	1.25	3.00 ⁷
653	3150-F-006	NM	20.05	NM	38.39	NM	USGS (2008) GW Contours	5.9	15.39 ⁶
786	3150-F-008	NM	19.80	NM	21.45	NM	This Study GW Contours	1.25	2.90 ⁷
851	3150-W-037	NM	20.50	NM	35.68	NM	USGS (2008) GW Contours	5.9	12.23 ⁶
879	3151-F-040	255.0	17.60	237.4	13.50	241.5	This Study, Level in UIC	1.25	-2.85 ⁵
900	3151-F-063	NM	8.30	NM	15.60	NM	This Study GW Contours	1.25	8.55 ⁷
901	3151-F-064	NM	10.50	NM	16.07	NM	This Study GW Contours	1.25	6.82 ⁷
902	3151-F-070	NM	10.00	NM	14.85	NM	This Study GW Contours	1.25	6.10 ⁷
938	2950-W-068	218.0	21.00	197.0	16.50	201.5	This Study, Level in UIC	1.25	-3.25 ⁵
939	2950-W-077	217.2	19.10	198.1	14.80	202.4	This Study, Level in UIC	1.25	-3.05 ⁵
988	3050-F-058	NM	17.90	NM	39.89	NM	USGS (2008) GW Contours	1.25	23.24 ⁷
1041	3050-F-063	246.6	19.40	227.2	12.00	234.6	This Study, Level in UIC	1.25	-6.15 ⁵
1045	3150-F-043	NM	10.70	NM	16.76	NM	This Study GW Contours	1.25	7.31 ⁷
1048	3150-F-046	NM	14.92	NM	16.75	NM	This Study GW Contours	1.25	3.08 ⁷
1049	3150-F-047	NM	15.00	NM	16.46	NM	This Study GW Contours	1.25	2.71 ⁷
1052	3150-W-050	NM	21.25	NM	32.26	NM	USGS (2008) GW Contours	5.9	8.06 ⁶
1053	3150-W-051	NM	21.50	NM	34.65	NM	USGS (2008) GW Contours	5.9	10.20 ⁶
1054	3150-W-052	NM	20.70	NM	36.41	NM	USGS (2008) GW Contours	5.9	12.76 ⁶
1056	3150-W-054	NM	20.10	NM	37.65	NM	USGS (2008) GW Contours	5.9	14.60 ⁶
2035	3151-F-055	249.7	13.95	NM	10.30	239.4	This Study, Level in UIC	1.25	-2.40 ⁵
2058	3151-F-061	NM	10.20	NM	17.15	NM	This Study GW Contours	1.25	8.20 ⁷
Group 5									
672	3155-K-041	NM	20.55	NM	14.5	NM	This Study, Level in UIC	1.25	-4.80 ⁵
836	3353-J-020	NM	17.60	NM	7.5	NM	This Study, Level in UIC	1.25	-8.85 ⁵
875	3448-J-019	NM	28.10	NM	34.2	NM	USGS (2008) GW Contours	5.9	3.16 ⁶
876	3448-J-020	NM	27.30	NM	34.1	NM	USGS (2008) GW Contours	5.9	3.87 ⁶
974	2748-W-044	NM	14.30	NM	35.6	NM	USGS (2008) GW Contours	5.9	18.30 ⁶
2002	2748-W-036	NM	12.00	NM	35.6	NM	USGS (2008) GW Contours	5.9	20.68 ⁶
2099	3353-J-019	NM	18.50	NM	7.8	NM	This Study, Level in UIC	1.25	-9.45 ⁵

Note

USGS = United States Geological Survey

NM = Not Measured

NAVD = North American Vertical Datum

bgs = below ground surface

Negative values for separation distance indicate UICs where the UIC intersects the groundwater table.

Grey-highlighted cells indicate that "depth to groundwater near UIC" is depth to perched water

Unhighlighted cells indicate that "depth to groundwater near UIC" is depth to regional groundwater

¹ Depth measured at the UIC after cleaning in April or May of 2012

² Depth to water is the depth to perched water. All other depths to groundwater is depth to regional groundwater

³ Seasonal fluctuation of 5.9 feet based on Table 2 of USGS (2008), and was used to adjust average depth to water to seasonal high. The groundwater depths measured as a part of this study in May and June of 2012 were reduced by 1.25 feet because the seasonal high was about 1.25 feet higher during 2012 than the seasonal highs during 2002 - 2011.

⁴ Separation distance based on the bottom elevation of the UIC, and a regional groundwater elevation measured at boring B-3 (i.e., 190.3 NAVD)

⁵ Separation distance based on the elevation of standing water in the UIC

⁶ Separation distance based on the total depth of the UIC and the USGS (2008) depth to groundwater study

⁷ Separation distance based on the total depth of the UIC and depth to groundwater contours calculated based on borings B-4, B-5, B-6, B-7, B-8 and B-9

BOLD text indicates water level measured immediately before UIC cleaning on 5/7 and 5/8. Other water levels were measured during the surveying on 6/6 and 6/9



Table 4. UIC Setback Analysis

UIC ID		Water Well ID	UIC Bottom Depth ¹ (feet bgs)	A. Protectiveness Based on Vertical Separation		B. Protectiveness Based on Horizontal Separation		Action Required by UIC WPCF Permit ⁴ (i.e., if A and B = "No")
Map ID	Unique GIS ID			Vertical Separation Distance from Seasonal High GW (feet)	Protective Vertical Separation? (i.e., SD > 5 Feet)	Horizontal Separation from Water Well (feet)	Protective Horizontal Separation? (i.e., SD > 335 feet)	
	2955-B-004	City of Wood Village	25.00	17.67	(2) Yes	1,605	Yes	None
406	2949-W-032	COG Cascade Wellfield	11.50	11.50	(3) Yes	1,609	Yes	None
407	2950-W-033		9.20	9.20	(3) Yes	1,599	Yes	None
	2950-W-047		17.00	40.58	(2) Yes	1,422	Yes	None
	2950-W-067		18.00	36.56	(2) Yes	1,532	Yes	None
	2950-W-023		17.00	61.77	(2) Yes	456	Yes	None
	2950-W-041		7.00	63.17	(2) Yes	863	Yes	None
	2950-W-043		25.00	35.97	(2) Yes	1,159	Yes	None
	2950-W-024		25.00	47.26	(2) Yes	674	Yes	None
	2950-W-025		25.00	47.30	(2) Yes	678	Yes	None
	3055-B-010	The City of Troutdale	9.00	56.81	(2) Yes	1,076	Yes	None
	3055-B-009		9.00	55.37	(2) Yes	909	Yes	None
	3055-B-007		18.00	47.32	(2) Yes	631	Yes	None
	3155-F-045		25.00	55.43	(2) Yes	1,422	Yes	None
	3055-B-016		25.00	30.73	(2) Yes	1,301	Yes	None
	3055-B-018		25.00	33.79	(2) Yes	1,367	Yes	None
	3055-B-015		25.00	32.06	(2) Yes	1,221	Yes	None
	3055-B-014		25.00	33.58	(2) Yes	1,154	Yes	None
	3055-B-004		25.00	42.84	(2) Yes	486	Yes	None
	3055-B-003		25.00	43.85	(2) Yes	396	Yes	None
	3055-B-005		25.00	40.95	(2) Yes	439	Yes	None
	3055-B-008		25.00	41.19	(2) Yes	681	Yes	None
	3055-B-017		25.00	30.81	(2) Yes	1,483	Yes	None
	3055-B-012		25.00	33.87	(2) Yes	1,024	Yes	None
	3055-B-006		25.00	40.70	(2) Yes	544	Yes	None
	3055-B-002		25.00	44.45	(2) Yes	228	No	None
	3054-B-002		25.00	57.74	(2) Yes	1,342	Yes	None
	3054-B-001		25.00	56.97	(2) Yes	1,070	Yes	None
	3055-B-011		25.00	56.19	(2) Yes	880	Yes	None
	3155-F-023		25.00	57.84	(2) Yes	1,030	Yes	None
	3155-F-024		25.00	57.53	(2) Yes	1,273	Yes	None
	3155-F-033		25.00	57.62	(2) Yes	975	Yes	None
	3155-F-034		25.00	57.72	(2) Yes	1,116	Yes	None
	3055-B-023		25.00	53.34	(2) Yes	781	Yes	None
	3055-B-026	25.00	41.63	(2) Yes	1,147	Yes	None	
	3055-B-027	25.00	46.46	(2) Yes	874	Yes	None	
	3054-B-011	25.00	58.58	(2) Yes	1,161	Yes	None	
	3054-B-012	25.00	60.02	(2) Yes	1,441	Yes	None	
	3449-J-017	Highland Community Church	12.00	44.96	(2) Yes	650	Yes	None
	3449-J-066		25.00	27.74	(2) Yes	160	No	None
	3449-J-073		25.00	28.66	(2) Yes	325	No	None
974	2748-W-044	Jean Burch	14.30	18.30	(2) Yes	344	Yes	None
2002	2748-W-036		12.00	20.68	(2) Yes	346	Yes	None
16	3050-F-017	John Pribeage	16.45	7.73	(2) Yes	472	Yes	None
18	3150-F-034		19.40	2.05	(3) No	149	No	Retrofit or Decommission
19	3050-F-014		13.60	6.77	(3) Yes	161	No	None
30	3050-F-010		15.35	3.06	(3) No	315	No	Retrofit or Decommission
549	3050-F-022		16.50	3.66	(3) No	401	Yes	None
572	3150-F-032		18.10	5.28	(3) Yes	445	Yes	None

UIC ID		Water Well ID	UIC Bottom Depth ¹ (feet bgs)	A. Protectiveness Based on Vertical Separation		B. Protectiveness Based on Horizontal Separation		Action Required by UIC WPCF Permit ⁴ (i.e., if A and B = "No")	
Map ID	Unique GIS ID			Vertical Separation Distance from Seasonal High GW (feet)	Protective Vertical Separation? (i.e., SD > 5 Feet)	Horizontal Separation from Water Well (feet)	Protective Horizontal Separation? (i.e., SD > 335 feet)		
1048	3150-F-046		14.92	3.08	⁽³⁾	No	385	Yes	None
1049	3150-F-047		15.00	2.71	⁽³⁾	No	407	Yes	None
	2750-W-049	Marcus Rojas-Sandy Mobile Villa	25.00	33.40	⁽²⁾	Yes	424	Yes	None
	3249-W-005	Mult. Co Gravel Yard (2 Wells)	25.00	38.50	⁽²⁾	Yes	234	No	None
	3249-W-004		25.00	38.71	⁽²⁾	Yes	190	No	None
	3249-W-007		25.00	38.41	⁽²⁾	Yes	57	No	None
	3448-J-042	North Pacific Homes	25.00	13.38	⁽²⁾	Yes	217	No	None
	3448-J-045		25.00	13.24	⁽²⁾	Yes	238	No	None
35	3150-F-013	Rockwood Solid Waste	21.00	5.49	⁽²⁾	Yes	218	No	None
384	3150-F-010		15.95	7.56	⁽³⁾	Yes	271	No	None
627	3150-F-011		20.35	3.00	⁽³⁾	No	275	No	Retrofit or Decommission
786	3150-F-008		19.80	2.90	⁽³⁾	No	459	Yes	None
851	3150-W-037		20.50	12.23	⁽²⁾	Yes	298	No	None
1052	3150-W-050		21.25	8.06	⁽²⁾	Yes	252	No	None
1053	3150-W-051		21.50	10.20	⁽²⁾	Yes	353	Yes	None
	3150-F-014		21.00	4.47	⁽²⁾	No	304	No	Retrofit or Decommission
	3150-W-007		20.00	15.73	⁽²⁾	Yes	403	Yes	None
	2847-W-045		Union Plaza Inc.	25.00	75.36	⁽²⁾	Yes	484	Yes

Note

¹ Feet bgs means length of the UIC from ground surface to bottom of UIC, in feet.

² Separation distance based on USGS (2008)

³ Separation distance based on GSI study

⁴ Corrective action is required if vertical separation AND horizontal separation are not protective. No corrective action is required if vertical separation OR horizontal separation are protective.

BOLD indicates a separation distance less than the protective criteria



Appendix A. Inspection Checklist: Private Runoff with Potential to Pollute Public UICs

1 RNO # _____	Weather (check \checkmark)	Comments	
2 Address _____	Runoff <input type="checkbox"/>	_____	
3 Bus. Name _____	Dry <input type="checkbox"/>	_____	
4 Does the property's runoff drain to a public UIC? YES NO CAN'T TELL	_____		
5 Runoff Areas: If Yes to #3, circle all of the following areas from which runoff drains to a public UIC: Driveway Apron Sidewalk Parking Strip Parking Lot Weephole Roof Other If Other is circled, describe what it is: _____			
6 Parking Lots: If Parking Lot is circled in #4, take a photo and fill in the following:		Photo # _____	
--# of Cars parked in lot at time of observation _____		--Total spaces for cars _____	
--Primary use of parking lot: (circle one)			
--Shopping Center or Mixed Use		--Employee/customer parking	
--Park		--Retail Store	
--Fueling Station		--Restaurant	
--Fleet		--Other _____	
--Is the parking lot paved or mostly paved? YES NO (Circle one)			
7 Known Pollution Potential: Check (\checkmark) as many of the following as apply:			
--Has a DEQ permit		_____	
--Hazardous waste generator		_____	
--Environmental cleanup site		_____	
8 Outdoor Activities: If there is evidence of outdoor activities, check relevant boxes:			
<i>Storage</i>	Present	Covered	Bermed or 2ndary Containment
--Storage of Liquid Materials in Stationary Tanks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Storage of Liquid Materials in Portable Containers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Storage of Pesticides or Fertilizers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Storage of Soil or Other Erodible Materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Storage of Solid Wastes, Scrap or Recycling Materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Vehicle or Equipment Parking or Storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Storage of Metal Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Transfer of Liquid Materials</i>	Present	Covered	Bermed or 2ndary
--Truck or Rail Loading or Unloading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Fueling Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Vehicle or Equipment Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Production and Application</i>	Present	Covered	Bermed or 2ndary
--Manufacturing or Processing of Metal Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Painting, Finishing or Coating of Vehicles or Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Vehicle or Engine Maintenance or Repair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Mining and Quarrying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--Smokestack or other evident air emission	<input type="checkbox"/>		
--Other: Please List: _____			
9 General Observations : _____			
10 Guestimate re. Overall Potential to Pollute <i>Public</i> UIC: (circle one) High Med Low			
11 Guestimate re. Overall Potential to Pollute <i>Private</i> UIC: (circle one) High Med Low			

If answer to #3 is NO, go no further.