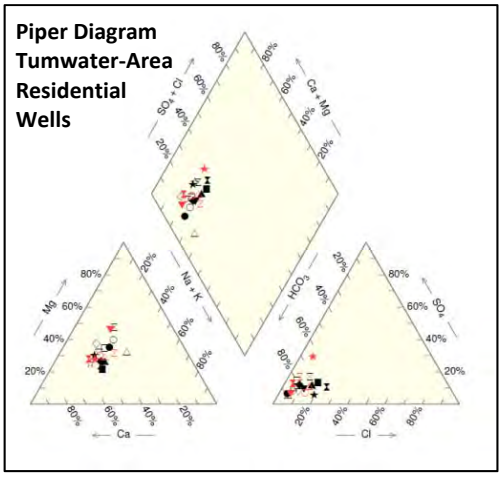
Groundwater Quality Characterization (Task 1.1)

LOTT Clean Water Alliance
Reclaimed Water Infiltration Study

Technical Memorandum

February 7, 2017



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Acronyms and Abbreviations

BIRWP	Budd Inlet Reclaimed Water Plant
BITP	Budd Inlet Treatment Plant
BPA	Bisphenol A
CFR	Code of Federal Regulations
DPR	Disinfection Byproducts
EEA	Eurofins Eaton Analytical
EPA	US Environmental Protection Agency
GC	Gas Spectrometry
GPS	Global Positioning System
IC	Ion Chromatography
LCS	Laboratory Control Sample
LC	Liquid Chromatography
LC/MS/MS	Liquid Chromatography Tandem Mass Spectrometry
LOTT	LOTT Clean Water Alliance
MCL	Maximum Contaminant Level
mgd	Million Gallons per Day
mg/L	Milligrams per Liter (or parts per million, ppm)
ml	Milliliter
MRL	Minimum Reporting Limit
MS/MSD	Matrix Spike / Matrix Spike Duplicate
MWRWP	Martin Way Reclaimed Water Plant
MS	Mass Spectrometry
N/A	Not Applicable
ND	Non-Detect or Not Detected
ng/L	Nanograms per Liter (or parts per trillion, ppt)
NTU	Nephelometric Turbidity Units
P	Phosphorus
PBDE	Polybrominated Diphenyl Ether
PCB	Polychlorinated Biphynels
PFC	Perflouorinated Compound
PFOS	Perfluorooctanesulfonic Acid
PFOA	Perfluorooctanoic Acid
PPB	Parts Per Billion
PPM	Parts Per Million
PPT	Parts Per Trillion
QC	Quality Control
RPD	Relative Percent Difference
RWIS	Reclaimed Water Infiltration Study
SM	Standard Method
SVOCs	Semi-Volatile Organic Compounds
TCE	Trichloroetheylene
TCEP	Tris(2-carboxyethyl) Phosphine
TCPP	Tris(2-chloroethyl) Phosphate

TDCPP	Tris(1,3-dichloro-2-propyl) Phosphate
TKN	Total Kjeldahl Nitrogen
TM	Technical Memorandum
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TTHM	Total Trihalomethane
USGS	U.S. Geological Survey
µg/L	Micrograms per Liter (or parts per billion, ppb)
VOCs	Volatile Organic Compounds
WAC	Washington Administrative Code

1.0 Introduction

1.1 Background

The LOTT Clean Water Alliance (LOTT) provides services to treat and manage wastewater for the urban areas of Lacey, Olympia, and Tumwater in Thurston County, Washington (at the southern end of Puget Sound). Since 2006, LOTT has also produced reclaimed water that is used for irrigation and other non-drinking purposes. Reclaimed water is also used to recharge (replenish) groundwater using rapid-infiltration basins at the Martin Way Reclaimed Water Aquifer Recharge Facility. The long-range plan for meeting future wastewater needs includes expanding reclaimed water production and developing additional groundwater recharge facilities.

LOTT is conducting a Reclaimed Water Infiltration Study (RWIS) to provide local scientific data and community perspectives to help policymakers make informed decisions about future reclaimed water treatment and use. The purpose of the RWIS is to improve the understanding of which chemicals may exist in LOTT's reclaimed water after treatment. These types of post-treatment residual chemicals (hereafter referred to as "residual chemicals") may include household chemicals, pesticides/herbicides, pharmaceuticals, personal care products, cooking products, flame retardants and other chemicals not removed during treatment. LOTT is evaluating how these residual chemicals exist in the local environment, how infiltrated reclaimed water interacts with soils and local groundwater, and what happens to the residual chemicals over time in the environment. The findings of the study will be used by LOTT and the wider community to make the most appropriate choices for reclaimed water management and protection of public health and the environment.

1.2 Purpose of Groundwater Quality Characterization Task

As part of Task 1.1 of the RWIS study, a groundwater quality characterization was completed by HDR during the summer and fall of 2015 in two areas in northern Thurston County, Washington. Specifically, LOTT will use this information to assess groundwater quality in areas currently used as or proposed for reclaimed water aquifer recharge sites. Ultimately this information will assist in evaluating the fate and transport of reclaimed water compounds in groundwater and it will be factored into the human health and ecological risk assessment.

1.3 Study Areas

The project scoping phase involved selecting study areas for groundwater quality characterization. The following attributes were desirable for the study areas:

- A mix of areas with residential and rural-residential land uses.
- A mix of areas with household septic tanks and public wastewater collection and treatment systems.
- An area with both residential wells and public supply wells completed in shallow and deep aquifers.

- Inclusion of areas with a current and a proposed future LOTT reclaimed water aquifer recharge site.

Two areas were selected with these characteristics. The first study area, the Hawks Prairie Study Area, is located north of the City of Lacey and between the Woodland Creek and McAllister Creek drainages (**Figure 1-1**). The City of Lacey and other public utilities and water districts operate both deep and shallow water supply production wells in this area. And, some residences utilize their own household wells. There are both private residential septic systems and public wastewater service in the area. LOTT currently operates a reclaimed water aquifer recharge project the Hawks Prairie Ponds and Recharge Basins in this area which infiltrates Class A reclaimed water to groundwater using eight 1-acre rapid infiltration basins. Reclaimed water aquifer recharge has been on-going at this facility since 2006, except that the facility was off-line from September 1, 2012 to early February 2014.

The second study area, the Tumwater Study Area, is located in the vicinity of the City of Tumwater between the Black River to the west and the Deschutes River to the east, shown on **Figure 1-1**. LOTT is considering developing a future reclaimed water aquifer recharge site within this area (the Henderson North Site). The City of Tumwater operates public supply wells within this area, and there also are numerous private residential wells. There is a mix of public wastewater collection service and household septic tanks.

The general topography of both study areas is shown on **Figure 1-2**.

1.4 Study Approach

In each of these study areas the following process was used. First, existing information was compiled to determine the area hydrogeology including the depths and extent of local aquifers used for water supply, regional groundwater flow paths and recharge/discharge characteristics. Second, information on residential and public supply wells in the study areas was obtained including well logs, locations, addresses and contact information. Residential well and public supply well owners were contacted and a questionnaire was mailed out requesting information on their groundwater supply system and permission to collect a groundwater sample from their well. Groundwater samples were obtained from a total of 33 residential wells, 1 background monitoring well, 1 spring and 22 public supply wells within the two study areas. At each well, a water quality scientist collected a groundwater sample from the existing pumping and distribution system and measured the depth to groundwater at the well (if possible). The samples were submitted for laboratory analyses for a variety of water quality parameters, including nutrients, metals, water quality indicator parameters and a variety of organic compounds including many chemicals present in household products, pharmaceuticals, pesticides/herbicides, flame retardants and other personal care products. The groundwater level and laboratory analytical data were then compiled, reviewed, validated and analyzed to characterize the groundwater quality in the two study areas.

In addition, the surface water quality data collected from Beatty Springs as part of the Surface Water Quality Characterization task (Task 1.2) is summarized in this report. These data are included because Beatty Springs is the surface expression of groundwater in the area. The full

presentation of the Beatty Springs water quality results is included in the Surface Water Characterization Technical Memorandum (HDR, 2016).

In addition, the groundwater quality data from the monitoring wells at the LOTT Hawks Prairie Ponds and Recharge Basins is presented in this report. These data are from sampling of the LOTT monitoring wells in November 2013, after aquifer recharge was "off" for about a 1-year period. The sampling locations and methods are described in a separate report (HDR, 2014).

1.5 Organization of Report

This report documents the methodology and findings of Task 1.1 – Groundwater Quality Characterization. The document is organized as follows:

- Section 2 summarizes the physical setting of the project areas focusing on prior hydrogeologic and groundwater quality studies and findings.
- Section 3 describes the field and laboratory methods.
- Section 4 summarizes the analytical results.
- Section 5 discusses the findings from other similar investigations from the literature.
- Section 6 provides a summary of the results.

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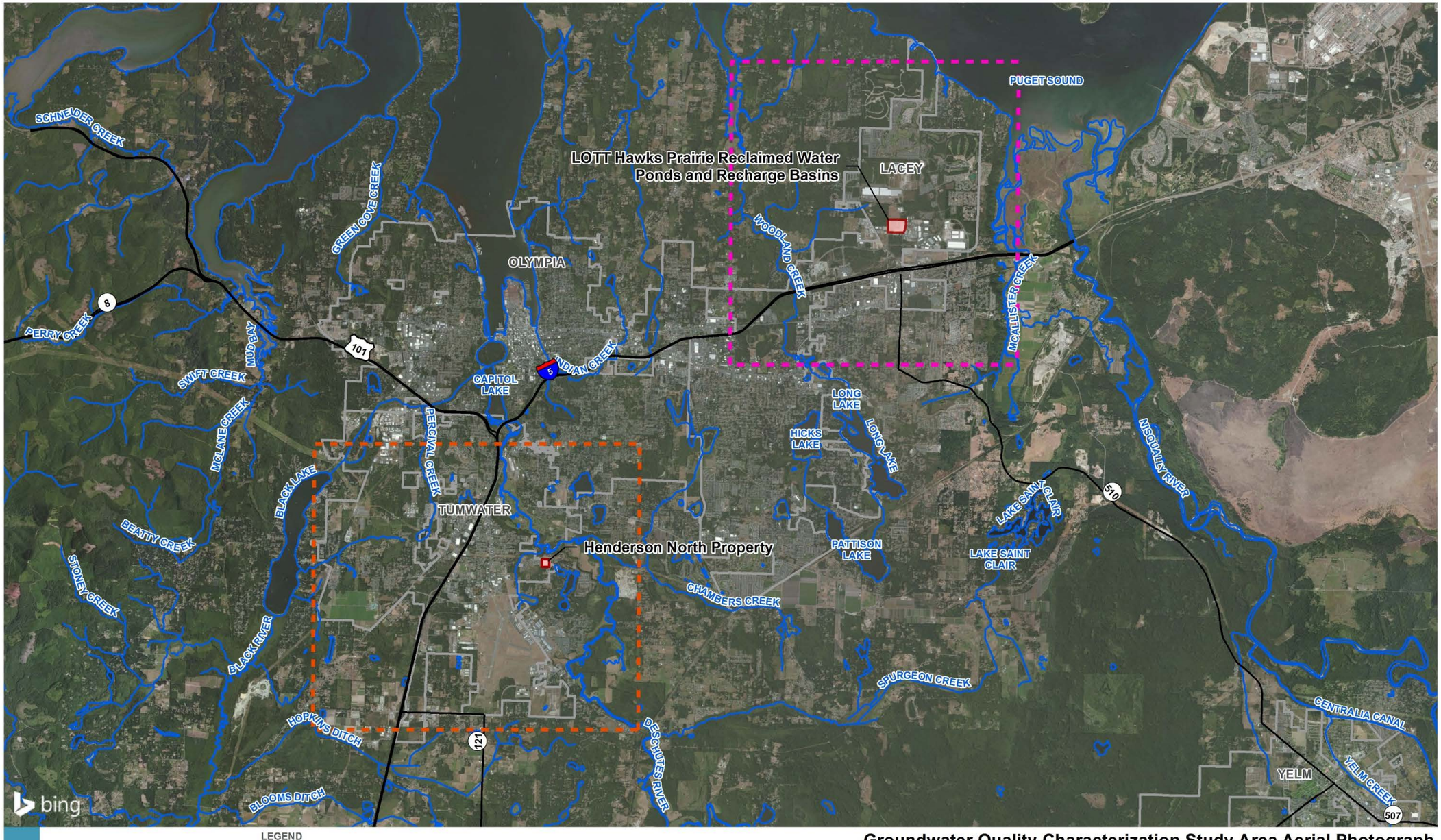

LEGEND

Existing or Proposed Reclaimed Water Aquifer Recharge Facilities

Study Areas

Hawks Prairie Study Area

Tumwater Study Area

City Limits

Major Roads

Stream/Shoreline

Groundwater Quality Characterization Study Area Aerial Photograph
Figure 1-1

0 1 2 Miles

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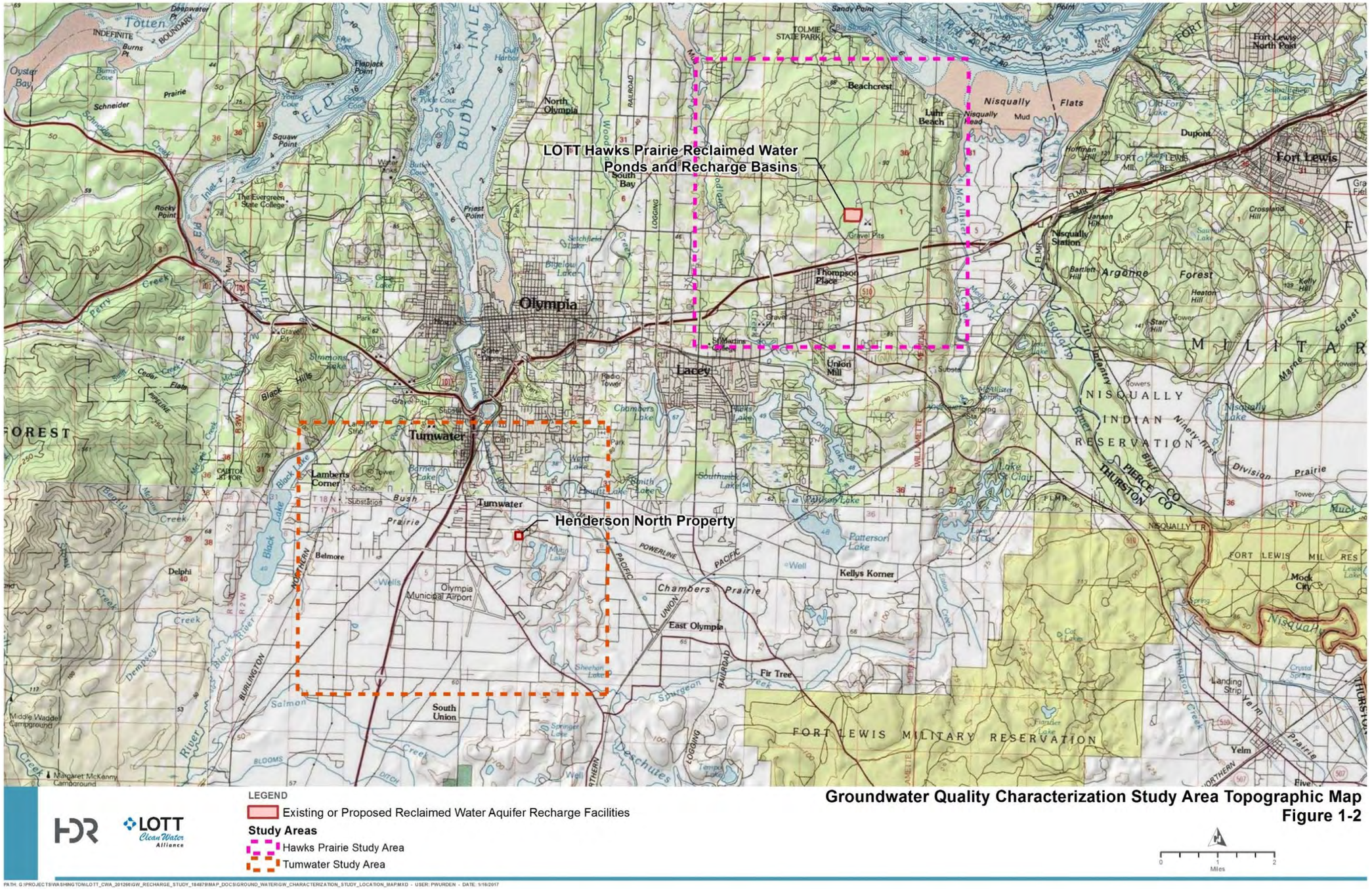

Groundwater Quality Characterization Study Area Topographic Map
Figure 1-2

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2.0 Physical Setting

2.1 Hawks Prairie Study Area

2.1.1 Climate

The climate of the Hawks Prairie Study Area is characterized by mild cool/wet winters and warm/dry summers. Precipitation and temperature data from the Olympia Airport USW00024227 gaging station (about 10 miles southwest of the Hawks Prairie Study Area) is shown on **Tables 2-1** and **2-2**. Over the 1948 to 2016 period of record, during the summer period from June to October, low/high temperature ranges from 46.8 to 77.2 degrees Fahrenheit (°F) and average total monthly precipitation ranged from 0.7 to 4.8 inches. During the winter period from December to February over the same period of record the low/high temperature ranges from 31.8 to 49.2 degrees °F and average total monthly precipitation ranged from 5.3 to 8.2 inches. Total average annual precipitation was 51.0 inches and average annual temperature was 50.0 °F.

2.1.2 Topography and Surface Water Drainage

The surface topography and the major surface water drainage features in the area are shown on **Figure 1-2**. The Hawks Prairie Study Area is located on the east side of a broad plateau about 8 miles wide (east to west) formed by deposition of sediments during multiple glaciations. The Nisqually River valley, located on the east side of the Hawks Prairie Study Area, is deeply incised through the glacial deposits forming a steep east-facing scarp. The western edge of the plateau is bound by Puget Sound (Budd Inlet) and the Deschutes River.

Woodland Creek bisects the plateau and forms the western border of the Hawks Prairie Study Area. Woodland Creek flows from Long Lake to the north into Puget Sound (Tumwater Inlet). Large springs (Beatty Springs) are located mid-way in the Woodland Creek drainage. Several tributaries to Woodland Creek (Eagle Creek and Fox Creek) drain the west side of the Hawks Prairie Study Area. McAllister Creek forms the eastern border of the Hawks Prairie Study Area. Numerous springs and seeps emanate along the toe of the eastern scarp which drain out to McAllister Creek. The Nisqually River and McAllister Creek flow from the south to the north to the Nisqually River delta/wetlands and into the Puget Sound. Steep scarps and Puget Sound bound the northern edge of the Hawks Prairie Study Area. The highest point within the study area is at elevation 300 feet. The Hawks Prairie Reclaimed Water Ponds and Recharge Basins is located in the central portion of the Hawks Prairie Study Area and surface topography on the property ranges from elevation 220 feet to 230 feet.

2.1.3 Hydrogeology

The hydrogeology of the Hawks Prairie Study Area is described in reports by Brown and Caldwell (2009; 2004), Drost et al. (1999), Golder (2011), Landau (2016), Northwest Land and Water (2008), Pacific Groundwater Group (2004) and Robinson and Noble (2001). Figures describing the hydrogeology of the area are presented in **Appendix A**.

2.1.3.1 Hydrogeologic Units

The Hawks Prairie Study Area was heavily glaciated, resulting in a sequence of stratified sediments that are regionally correlated based on their water bearing properties. The geology of the area is presented in surface geologic maps and reports by Drost et al. (1999), see **Figure A-1**. The hydrostratigraphy from Drost et al. (1999) is shown on **Figure A-2**. More recent surface geology mapping by Logan et al. (2003) is shown on **Figure A-3**.

The hydrostratigraphic units are discussed below from top to bottom. Hydrogeologic cross sections from prior groundwater supply development projects are presented on **Figures A-4** to **A-12**. Unit nomenclature differs between the two sources of data. In the text below identifiying unit characteristics, the unit abbreviations are in parenthesis. The unit descriptions from Drost, et al are depicted first, followed by the more recent abbreviations used in Logan et al.

- Late Vashon Sediments in Woodland Creek Valley (Qgof/Qgos). Late Vashon sediments were deposited in the Woodland Creek valley during deglaciation. Sediments consist of sandy/silt up to 100 feet thick in the upper part of the drainage and less thick silty/clay in the lower part of the drainage. This unit forms an unconfined aquifer within the Woodland Creek valley.
- Alluvium Vashon Recessional Gravel Outwash (Qvr, also known as Qgo). Alluvium and recessional glacial outwash sand and gravel form an unconfined aquifer where saturated. Where unsaturated this unit comprises the vadose zone. Approximate thickness of the unit ranges from being absent (eroded) to over 100 feet thick in places. This is the upper-most water bearing unit in the Hawks Prairie Study Area.
- Vashon Till (Qvt, also known as Qgt). Deposits of dense (compacted) unsorted silt, clay, sand and gravel form a regional confining unit which impedes the vertical flow of groundwater. The unit is either completely or partially unsaturated in many areas across the Hawks Prairie Study Area. The till unit is not present underlying most of the LOTT Hawks Prairie Ponds and Recharge Basins. Approximate thickness of the unit ranges from being absent to over 50 feet in thickness.
- Vashon Advance Outwash Aquifer (Qva, also known as Qga). The Vashon Advance Outwash is a regional confined aquifer composed of sand and gravel and is infrequently used as a supply source for smaller public water systems. This is the upper-most water bearing aquifer in areas where the Qvr is not saturated. The Qvr and Qva units are sometimes called the “Upper Aquifer” or “Shallow Aquifer” in previous studies. The depth to the bottom of the Upper Aquifer is generally within 150 feet, although may be deeper in places. Well yields within the Hawks Prairie Study Area for the Upper Aquifer are reported up to 250 gallons per minute (gpm).
- Kitsap Formation (Qf). The Kitsap Formation is a low-permeability silt, sand and clay formation that is a regional confining unit up to 150 feet thick between the upper aquifer and the deeper aquifer.
- Pre-Vashon Coarse Deposits (Qc). This thick (up to 150 feet) sequence of coarse stratified sand and gravel is highly permeable and forms a regional aquifer used

extensively for public supply. Well yields of up to 1,650 gpm have been reported for this aquifer. This is also sometimes called the "Sea Level Aquifer" in previous studies.

- Tertiary Unconsolidated and Undifferentiated Sediments (TQu). Layers of clay, silt, sand and gravel of glacial and non-glacial origin above bedrock are characterized as tertiary unconsolidated and undifferentiated sediments. In some places, deep public supply wells have been completed in the coarse TQu sand and gravel units which form a deep confined aquifer. This is sometimes called the "Deep Aquifer" in previous studies. Well yields of up to 860 gpm have been reported on logs for wells completed in the Deep Aquifer within the Hawks Prairie Study Area.

2.1.3.2 Groundwater Levels and Flow Directions

The U.S. Geological Survey (USGS) completed groundwater level monitoring during 1988 and the groundwater flow direction map developed from that work is presented in **Figure A-13** (Drost 1999). Groundwater in the Upper (Qvr/Qva) Aquifer flows to the southwest to Woodland Creek or to the east to McAllister Creek following a surface topographic divide occurring between the two drainages. Groundwater in the Upper (Qvr/Qva) Aquifer at the Hawks Prairie Ponds and Recharge Basins also flows to the southwest. Groundwater flow in the Sea Level (Qc) Aquifer is reported to flow to the east and north eventually discharging to McAllister Creek and/or the Puget Sound (NWLW, 2008). Groundwater flow in the Deep (TQu) Aquifer flows to the north discharging to Puget Sound (NWLW, 2008).

The reach of Woodland Creek north of Long Lake generally loses water to groundwater in the Upper Aquifer. The reach of the creek between Long Lake and Lois Lake flows perennially and the reach of the creek between Lake Lois and Interstate 5 usually becomes dry in the summer. North of I-5, the depth to groundwater is shallow and groundwater discharges into Woodland Creek at Beatty Springs, Martin Springs and in other diffuse springs and wetlands.

Along the east side of the study area groundwater discharges out of the Upper Aquifer and the Sea Level Aquifer along seeps and springs at the bottom of the scarp and drains to McAllister Creek.

2.1.3.3 Groundwater Quality

Prior investigations on the groundwater quality in the Hawks Prairie Study Area have been conducted by Drost (1998), Thurston County (1999), PGG (2002; 2007) and Golder (2011). These studies concluded that with the exception of nitrate, groundwater quality was relatively good with low concentrations of inorganic parameters and metals that were below the Federal and State drinking water limits. Iron, manganese and total dissolved solids (TDS) are reported above the secondary MCLs in Golder (2011), but the issues with those compounds are mainly due to taste, color and staining issues. There were very few detections of organic pollutant compounds and these were below the drinking water limits. However, elevated nitrate has been detected in the southern Hawks Prairie Study Area and especially in the upper portion of the Woodland Creek drainage. In this area, high groundwater levels, poor drainage and dense residential development on septic systems has likely resulted in high nitrate levels and fecal coliform contamination in Woodland Creek (PGG, 2007; Sargeant, 2006). The discussion below mainly focuses on that issue.

The U.S. Geological Survey (USGS) completed groundwater quality sampling in 1988 in the Hawks Prairie Study Area (Drost, 1998). Concentrations of nitrate in groundwater are shown on **Figure A-14**. For the area north of I-5, nitrate in groundwater generally was below 1 milligram per liter (mg/L), with a few instances of nitrate from 1.1 to 2.0 mg/L. South of I-5 in the areas with higher residential developments (and septic systems), nitrate regularly was reported in the 2.2 to 5.0 mg/L range with a few exceedances in the 5 to 10 mg/L range. As a point of reference, the State and Federal drinking water standard for nitrate as nitrogen (nitrate-N) is 10 mg/L. The other inorganic water quality parameters reported were generally indicative of high groundwater quality.

Thurston County completed a study of groundwater quality in 1996 to 1998 in the North Thurston County area, and the results are shown on **Figure A-15**. Nitrate plus nitrite in the Upper Aquifer (Qva/Qvr) ranged from <0.01 to 4.21 mg/L, with the average ranging from 1.79 to 2.25 mg/L (Thurston County, 1999). Nitrate in about half of the wells increased from the 1988 USGS study to the late 1990s. The other inorganic water quality parameters reported were generally indicative of high groundwater quality. PGG's (2002) hydrogeology report provides a summary of groundwater quality investigations in the southeast area of the study area and reports area where nitrate exceeds 4 and 7 mg/L, as shown on **Figure A-16**.

The Total Maximum Daily Load (TMDL) water quality report for Woodland Creek and Henderson Inlet reports that nutrients in groundwater (nitrate and phosphorus) are the major source for nutrient loading to these surface water bodies and estimated phosphorus loading to the lower reach of Woodland Creek at up to 6 pounds per day and estimates nitrogen loading to the lower reach of Woodland Creek at up to 135 pounds per day (Sargeant, 2006).

Thurston County then commissioned a detailed study of the nitrate issues in groundwater in the south part of the Hawks Prairie Study Area and nutrient loading to Woodland Creek (PGG, 2007). **Figure A-17** shows the maximum observed nitrate concentrations from groundwater sampling conducted from the 1980s to the mid-2000s. The PGG (2007) report indicated nitrate concentrations in groundwater in the south part of the Hawks Prairie Study Area ranged up to 10 mg/L with three wells exceeding 10 mg/L. The PGG (2007) report suggests that a high density of residences with septic tanks combined with a relatively shallow groundwater table near the upper (south) part of the Woodland Creek drainage is causing loading of nitrate and fecal coliform to Woodland Creek. The PGG (2007) report indicates that three water supply wells have been abandoned in this area due to high nitrate concentrations in groundwater.

In 2013 Thurston County completed a septic to sewer conversion at 128 residences in the Woodland Creek Estates and Covington Place neighborhoods, an area with high groundwater nitrate concentrations and a high density of septic system failures (Thurston County, 2013). Thurston County also has attempted to reduce fecal bacteria that enters Woodland Creek from the Tanglewilde community by installing stormwater dry wells and infiltration galleries (Thurston County, 2012).

2.2 Tumwater Study Area

2.2.1 Climate

The climate of the Tumwater Study Area is similar to the Hawks Prairie Study Area (see Section 2.1.1). The Olympia Airport USW00024227 gaging station referenced in Section 2.1.1 is located within the Tumwater Study Area.

2.2.2 Topography and Surface Water Drainage

Figure1-2 shows the surface topography and the major surface water drainage features. The Tumwater Study Area includes part of the City of Tumwater and the Olympia Municipal Airport. This is a glaciated plain located between the Black River and Black Lake to the west and the Deschutes River to the east. The Deschutes River valley is eroded through the upper section of the glacial deposits and is a major drainage feature in the region with many tributary creeks. The Deschutes River flows to the north into Budd Inlet. There are several pothole/kettle lakes within the Tumwater Study Area including Barnes Lake and Munn Lake.

2.2.3 Hydrogeology

The hydrogeology of the Tumwater Study Area is described in geology reports by Logan et al (2003) and Walsh and Logan (2005) and in hydrogeology reports for water supply projects by PGG (1992, 1996) and AESI (1997).

2.2.3.1 Hydrogeologic Units

The Tumwater Study Area geology is the result of multiple glacial advances and retreats. The geology of the area is presented on the surface geologic maps by Logan et al. (2003) and Walsh and Logan (2005) shown on **Figure A-18**. The hydrostratigraphic units are discussed below from top to bottom. Hydrogeologic cross-section from prior hydrogeology reports of the area by PGG (1992) and AESI (1997) are presented on **Figures A-19** to **A-23**.

- Deschutes River Valley Alluvium (Qa). The Deschutes River eroded a valley through the glacial sediments which is backfilled with recent alluvium. Alluvial sediments present in the Deschutes River valley consist of silt, sand, and gravel up to several hundred feet in thickness. The Deschutes River valley alluvium is not typically used as a groundwater supply source.
- Alluvium Vashon Recessional Outwash (Qvr, also known as Qgo). Recessional outwash is present at the surface throughout much of the Tumwater Study Area east and west of the Deschutes River Valley. Where saturated, this forms an upper unconfined aquifer. The outwash generally consists of finer-grained silt on the northeast side of the Tumwater Study Area near Munn Lake and silty sand to sand in other areas. AESI (1997) reports a thickness of 0 to 240 feet. The recessional outwash has low permeability, and is susceptible to surface contamination. For these reasons, it is generally not used as a water supply aquifer except for the most-shallow of residential wells.
- Vashon Till (Qvt). Deposits of dense (compacted) unsorted silt, clay, sand and gravel form a regional confining unit throughout most of the Tumwater Study Area from 10 to 40

feet thick (AESI, 1997). The till is dense and thick enough to impede the vertical flow of groundwater.

- Vashon Advance Outwash Aquifer (Qva, also known as Qga). The Vashon Advance Outwash is a regional confined aquifer composed of sand and gravel and is one of the major public supply groundwater aquifers for the City of Tumwater and others. PGG (1996) reports well yields between 275 and 2,350 gpm and specific capacities ranging from 4 to 75 gallons per minute per foot (gpm/ft). The Qvr and Qva units collectively are sometimes known called the "Upper Aquifer" or "Shallow Aquifer" in previous studies.
- Kitsap Formation (Qf). The Kitsap Formation is a low-permeability silt/sand/clay formation that is a regional confining unit up to 140 feet thick between the upper aquifer and the deeper Qc aquifer.
- Pre-Vashon Coarse Deposits (Qc). This is a permeable coarse stratified sand and gravel used extensively for public supply by the City of Tumwater and others. Specific capacity ranges from 1.4 to 25 gpm/ft (PGG, 1992). This is sometimes called the "Sea Level Aquifer" in previous studies.
- Tertiary Unconsolidated and Undifferentiated Sediments (TQu). Layers of clay, silt, sand and gravel of glacial and non-glacial origin. This is sometimes called the "Deep Aquifer" in previous studies. Within the Tumwater Study Area, Tumwater Well 7 and one of the Olympia Brewery wells are completed in this deep aquifer.

2.2.3.2 Groundwater Levels and Flow Directions

Groundwater potentiometric elevations are shown on **Figures A-24** and **A-25** for the Upper (Qva and Qvr) Aquifer from AESI (2007). Groundwater flows from the south to the north and northeast to the Deschutes River. Groundwater discharges into the Deschutes River, especially in the northern part of the Tumwater Study Area (Sinclair and Bilhimer, 2007). The lakes in the area (Munn Lake, Barnes Lake, Lake Susan) are "kettle" or "pothole" lakes that are directly hydraulically connected to shallow groundwater and the lake elevations generally are reflective of regional groundwater elevations.

2.2.3.3 Groundwater Quality

The groundwater quality in the Tumwater Study Area is described in reports by PGG (1992; 1996), AESI (1997) and by Drost (1998).

PGG (1992) reports on groundwater quality from the City of Tumwater wells completed in the Shallow (Qva/Qvr) aquifer. PGG (1992) reports that groundwater quality in the Tumwater Study Area is good with total dissolved solids usually less than 100 mg/L, chloride less than 10 mg/L and iron and manganese usually at less than 0.01 mg/L. Nitrate-N in the area is somewhat elevated at concentrations of up to 3 mg/L nitrate-N.

AESI (1997) and Drost (1998) indicate that inorganic groundwater quality parameters in the study area generally are below the Primary and Secondary Federal drinking water limits with the exception of iron and manganese that occasionally exceeded their maximum contaminant limit (MCL) limit of 0.3 mg/L and 0.050 mg/L, respectively. Nitrates usually ranged up to 3 mg/L

(nitrate-N) with occasional concentrations up to 4 to 5 mg/L. No specific areas were reported with excessive nitrate issues. AESI (1997) reports that trichloroethylene (TCE) contamination was identified at the City of Tumwater Palermo Wellfield; however, this issue has been investigated and remediation is underway.

Roberts et al. (2012) provide a summary of nutrient concentrations in the lower reach of the Deschutes River within the Tumwater Study Area (below River Mile 6). Total nitrogen concentrations in the river were reported with a median (50 percentile) concentration of up to 0.8 mg/L and median total phosphorus concentrations were reported up to 0.2 to 0.3 mg/L. Wagner and Bilhimer (2015) indicate that groundwater is the largest source of nitrate and phosphorus loading to the Deschutes River.

Table 2-1. Average precipitation for 2015 and for the 1948 to 2016 record from the Olympia Airport gaging station.

Date	Average Precipitation over the Period of Record (1948 - 2016) (in)	2015 Precipitation (in)
Monthly Average		
January	7.87	6.69
February	5.69	5.28
March	5.28	5.94
April	3.37	1.93
May	2.17	0.67
June	1.54	0.14
July	0.70	0.15
August	1.17	2.84
September	2.13	0.90
October	4.78	6.69
November	8.22	11.83
December	8.12	14.50
Total Annual	51.0	57.56

Note: Precipitation Data from GHCND Station USW00024227, Olympia Airport.

Table 2-2. Average temperature for 2015 and for the 1948 to 2016 record from the Olympia Airport gaging station.

Date	1948-2016 Monthly Average High (°F)	1948-2016 Monthly Average Low (°F)	1948-2016 Monthly Average Temperature (°F)	2015 Monthly Daily Average High (°F)	2015 Monthly Daily Average Low (°F)	2015 Monthly Average (°F)
January	44.7	31.8	38.3	49.3	36.0	42.6
February	49.2	32.5	40.8	55.0	37.0	46.0
March	53.3	33.9	43.6	59.2	36.7	47.8
April	58.8	36.6	47.7	60.3	36.7	48.6
May	65.7	41.7	53.7	68.4	44.8	56.7
June	70.9	46.8	58.8	79.9	50.2	65.1
July	77.2	49.6	63.4	83.3	52.9	68.0
August	77.2	49.7	63.4	80.4	52.0	66.2
September	71.6	45.4	58.5	70.2	45.5	57.9
October	60.5	40.0	50.2	64.2	44.8	54.5
November	50.4	35.5	43.0	48.9	33.8	41.4
December	44.8	32.6	38.7	46.0	35.1	40.6

Note: Temperature Data from GHNCD Station USW00024227, Olympia Airport

3.0 Field and Laboratory Methods

This section provides a summary of the study field and laboratory methods.

3.1 Work Plan

The task goals, methods and procedures are described in the document, *Work Plan Task 1.1, Groundwater Quality Characterization, Hawks Prairie Study Area, LOTT Clean Water Alliance, Reclaimed Water Infiltration Study, Phase III – Study Implementation* (work plan) dated February 6, 2015.

3.2 Locating Study Wells

The study is designed to collect groundwater samples from existing residential and public supply wells within the two study areas. Residential well logs were obtained from the Washington State Department of Ecology (Ecology) and mapped to the nearest quarter/quarter section using the Township/Range/Section information on the well log. Public records including County property tax records and public address databases were researched to obtain parcel addresses. For public supply wells the Washington State Department of Health (DOH) and the Thurston County Department of Health records were obtained to identify well logs and public supply well owners. Introductory letters were sent out to 252 residential wells owners and the owners of two public supply well systems in the Tumwater Study Area and to 125 residential well owners and 58 owners of public supply wells in the Hawks Prairie Study Area. The introductory letters included an invitation to participate in the study, a questionnaire related to well characteristics, and requested permission to visit their property and collect a groundwater sample. Follow-up phone calls were placed to well owners that responded positively to the invitation.

3.3 Groundwater Sample Locations

Groundwater samples were collected from domestic and municipal water wells where a positive response was received to the invitation to participate. Wells were sampled in the Hawks Prairie Study Area from April to June 2015 and from the Tumwater Study Area from August to September 2015. Two springs (Salmon Lane area springs and Beatty Springs) were also sampled, since although the springs are technically classified as surface water, they originate from groundwater and are very good indicators of groundwater quality. The breakdown of the types of groundwater wells sampled for each area are shown below. The well locations where groundwater samples were collected are identified on **Figures 3-1** and **3-2**. The details of well locations and well construction information are presented in **Appendix B**.

Hawks Prairie Study Area Groundwater Sampling Locations

- 13 residential wells.
- 12 public supply wells.
- 1 monitoring well (Thurston County well MW-15).

- 2 springs (the Salmon Lane-area springs was sampled once as part of the groundwater quality characterization task and the Beatty Spring was sampled quarterly for a year (four samples) as part of the surface water quality characterization task.

Tumwater Study Area Groundwater Sampling Locations

- 20 residential wells.
- 10 public supply wells.

Resampling was required at three of the Hawks Prairie wells because of errors in the original sample collection and laboratory mislabeling of sample bottles. The three wells resampled were residential well RES-983 and the City of Lacey wells S-16 (MUN-1217) and S-31. These wells were resampled on May 2, 2016.

This report also includes groundwater quality data from the monitoring wells at the LOTT Hawks Prairie Ponds and Recharge Basins site. These monitoring wells were sampled during November 2013 after aquifer recharge was "off" for about a 1-year period. The LOTT Hawks Prairie Ponds and Recharge Basins monitoring wells are also shown on **Figure 3-1** and the sampling methods are described in a separate report (HDR, 2014).

3.4 Groundwater Sample Collection Procedures

All sampling was conducted by trained HDR field scientists in accordance with the work plan. Static groundwater level measurements were collected from wells where the casing was accessible prior to obtaining a groundwater quality sample. The following process was used to measure the depth to groundwater for casing accessible wells. Prior to sampling, each well was visually inspected. Wells were only sampled if they were in good condition with a secured cap that could be easily removed without causing damage. Next, the water level meter probe and tape were decontaminated with a chlorine bleach solution prior to each measurement. The well caps were then removed and an electric groundwater level meter was used to measure the depth to groundwater within a 0.01-foot accuracy. A high-precision Trimble Global Positioning System (GPS) was utilized to survey the top of well casing elevations. The GPS system was allowed to run during sample collection in order to increase vertical accuracy in the measurements. Vertical accuracy of the elevations measured by GPS were generally within 1 to 2 feet. If a well was located in a well house where the GPS could not obtain a satellite signal, the GPS was placed as near to the well as possible in a location a satellite signal could be obtained. The groundwater level data are presented in **Appendix B**.

In all locations, groundwater samples were collected using the existing pump and distribution system for both the public supply and residential wells. (HDR did not collect any samples using an independent sampling pump.) Prior to sampling residential wells, HDR spoke with homeowners to identify an outdoor spigot to be used for sample collection. Residential spigots were chosen to minimize the distance away from the well head and were located upstream of any water filters or water softening equipment. If a spigot could not be identified between the filter/water softener system and the well head and the filter/water softener system could not be turned off, no sample was collected. Municipal well samples were collected from sample ports identified by the municipality representative.

Prior to sample collection, wells were purged by opening the spigot, sample port, or well blowout port (municipal wells only) allowing water to run for a sufficient purge time, either 15 minutes, three pump cycles, or a minimum of three well volumes. In some instances, a hose was connected to the spigot to allow for discharge of water away from the spigot; in these cases, the hose was disconnected prior to sample collection and the sample was collected either directly from the spigot or from new clear polyvinyl chloride (PVC) tubing. PVC tubing was utilized for sample collection only in situations where sample bottles could not be directly filled (i.e., the spigot was too close to the ground for the bottle to fit underneath the spigot) and water was purged through the tubing for several minutes prior to sample collection.

Exceptions to this sample collection methodology included the Thurston County Landfill upgradient (background) groundwater monitoring well MW-12, the Salmon Lane Spring, and Beatty Springs. At MW-12, a groundwater sample was collected using a Grundfos electric sampling pump using new polyethylene tubing and using low-flow sampling procedures. At the Salmon Lane Spring, samples were collected directly from where the spring emanates from the toe of the hillslope. Beatty Springs was sampled in accordance with surface water methodology described in the Surface Water Characterization Technical Memorandum (HDR, 2016).

Field parameters, including pH, temperature, dissolved oxygen, conductivity, and oxygen reduction potential, were collected immediately prior to sampling by filling a decontaminated sampling cup directly from the spigot and submersing the probe of a YSI Pro multi-meter in the cup. After allowing the readings to stabilize, field parameters were recorded on individual field sheets. The field parameter data are presented in **Appendix C**.

Laboratory-supplied sample bottles were utilized for sample collection. Sample bottles were labeled with a unique sample identification number, sample date and time, and requested analysis. Samples bottles were filled with water directly from the spigot (except as noted above), preserved with laboratory-supplied chemical preservative, if required, and placed in an ice-filled cooler. Dissolved metals and dissolved total phosphorus were collected by filling a clean unpreserved laboratory-supplied container with water and filtering the water through a disposable 0.45 micron QED sampling filter into the appropriate containers using a peristaltic pump with polyethylene tubing. New filters and pump tubing were used for each sample.

One field duplicate was collected within each of the study areas from a randomly chosen location. Field duplicates were collected by filling two identical sets of sample containers with water from the same well for each of the planned analyses. Field duplicates were given unique sample numbers and sample times.

Samples were tracked using proper chain-of-custody procedures. One chain-of-custody was completed for each residential sample; multiple municipal samples were combined onto a single chain of custody if the samples were shipped within the same cooler and originated from the same municipality. Complete chains-of-custody accompanied the samples from collection through shipping, sample receipt at the laboratory, and analysis.

Samples were shipped to Eurofins Eaton Analytical (EEA) in coolers for analysis using next-day air shipping. Prior to shipment, sample bottles were wrapped in bubble wrap and placed inside

coolers for shipment. All sample bottles for a discrete sample were shipped within the same cooler. Two large new plastic bags were placed within each cooler prior to packing samples for shipment. The sample bottles were placed within an inner plastic bag, the bag was sealed, and loose ice was placed in the outer bag to cool the samples to 4°Celcius (C). The outer bag was sealed to prevent leaking during shipment. The chain of custody was placed in a zip-top plastic bag and taped to the interior lid of the cooler. The cooler was taped shut and transported for overnight shipment to EEA. Samples collected on Friday were labeled for Saturday delivery to the laboratory.

3.5 Laboratory Analyses and Data Validation

All laboratory analyses were completed by EEA. Laboratory analyses were conducted according to the EPA Methods or Standard Methods identified on **Table 3-1** and as outlined in the work plan.

Upon completion of the laboratory analysis, the laboratory data packages were reviewed for completeness at the end of each study area sampling event. A laboratory data validation review was completed to confirm accuracy and completeness for these items: sample identification, chain-of-custody and sample receiving, preservation methods, hold and extraction times, laboratory detection limits, surrogate recovery, blanks, spikes, duplicates, control samples, matrix spike, and matrix spike duplicate.

A tabular summary of all results, including qualifiers, is presented in **Appendix E**. The data validation report documenting the data review process is included in **Appendix D**. Complete laboratory reports are included in **Appendix F** (provided as separate files).

The laboratory quality control/quality assurance and data validation/verification steps with the most significant impacts to the data in this technical memorandum (i.e., resulting in the most data qualifications) are summarized as follows:

1) **Hold Times.** Upon initial review, several residual chemical analytes were determined to have exceeded hold times. A subsequent hold time study was conducted in 2016 to determine the effects of long hold times on the pharmaceuticals and personal care products (PPCPs) and perflourinated compounds (PFCs) analyzed by method LC-MS-MS. A summary of that hold time study and its results is provided in **Appendix E**. In brief, the study found that 90 of the 98 compounds evaluated appear to remain stable throughout an 84 day period (i.e., beyond the longest hold time experienced in this study). Eight compounds appear to show evidence of degradation or analytical variability, as follows:

    - Two compounds (metazachlor and metolachlor) began to degrade after approximately two weeks. Because all metazachlor and metolachlor samples were analyzed past a two week hold time, all of the results for these two parameters are assigned an “R” data quality flag, indicating the data are rejected. For the wastewater and reclaimed water quality evaluation described in this technical memorandum, this impacts only the metazachlor data, as metolachlor was not

analyzed for (this compound was added to the laboratory's standard analytical list after the start of this effort).

- Four compounds (amoxicillin, azithromycin, cimetidine, and nonyl-phenol) show analytical variability on individual days and between days. Therefore, the results for these compounds should be considered semi quantitative (i.e., concentration results are estimates). "J" data quality flags are assigned for all of the results for these compounds (non-detects are assigned a "UJ" flag). All of these chemicals were detected at least once in raw wastewater, while only nonyl-phenol was also detected in reclaimed water.
- Two compounds (nifedipine and theophyline) show concentrations consistently under or over the laboratory control sample (LCS) limits, but no evidence of inconsistent variability or degradation. This appears to be the result of a sample matrix effect or calibration artifact for this sample. "J" data quality flags are assigned for all of the results for these compounds (non-detects are assigned a "UJ" flag). Nifedipine was detected at least once in raw wastewater and in reclaimed water. Theophyline was not analyzed for (this compound was added to the laboratory's standard analytical list after the start of this effort).

2) **Surrogate Spike Recovery.** Surrogates are organic compounds that are similar in chemical composition, extraction, and chromatography to certain analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analysis. Surrogate spikes were added to each sample for analysis of many of the organic parameters included in this study (EPA Methods 515.4, 505, 525.2, 524.2). The reported surrogate recoveries were within the control limits.

3) **Matrix Spike Recovery.** Another means by which to examine matrix effects is to spike samples with known concentrations of analytes and compare percent recoveries to statistical control limits. Some residual chemicals for a small number of samples had results that were outside the quality control limits. The results for these chemicals were flagged as described in more detail in **Appendix D**.

4) **Laboratory Control Sample Spike Recovery.** Laboratory Control Samples (LCS) are samples of known concentration that are carried through the extraction and analysis process. The percent recovery is the percentage of the theoretical concentration, and has statistical control limits indicating that the analytical process is "in control." Some residual chemicals for a small number of samples had results that were outside the quality control limits. The results for these chemicals were flagged according to the results, as described in more detail in **Appendix D**.

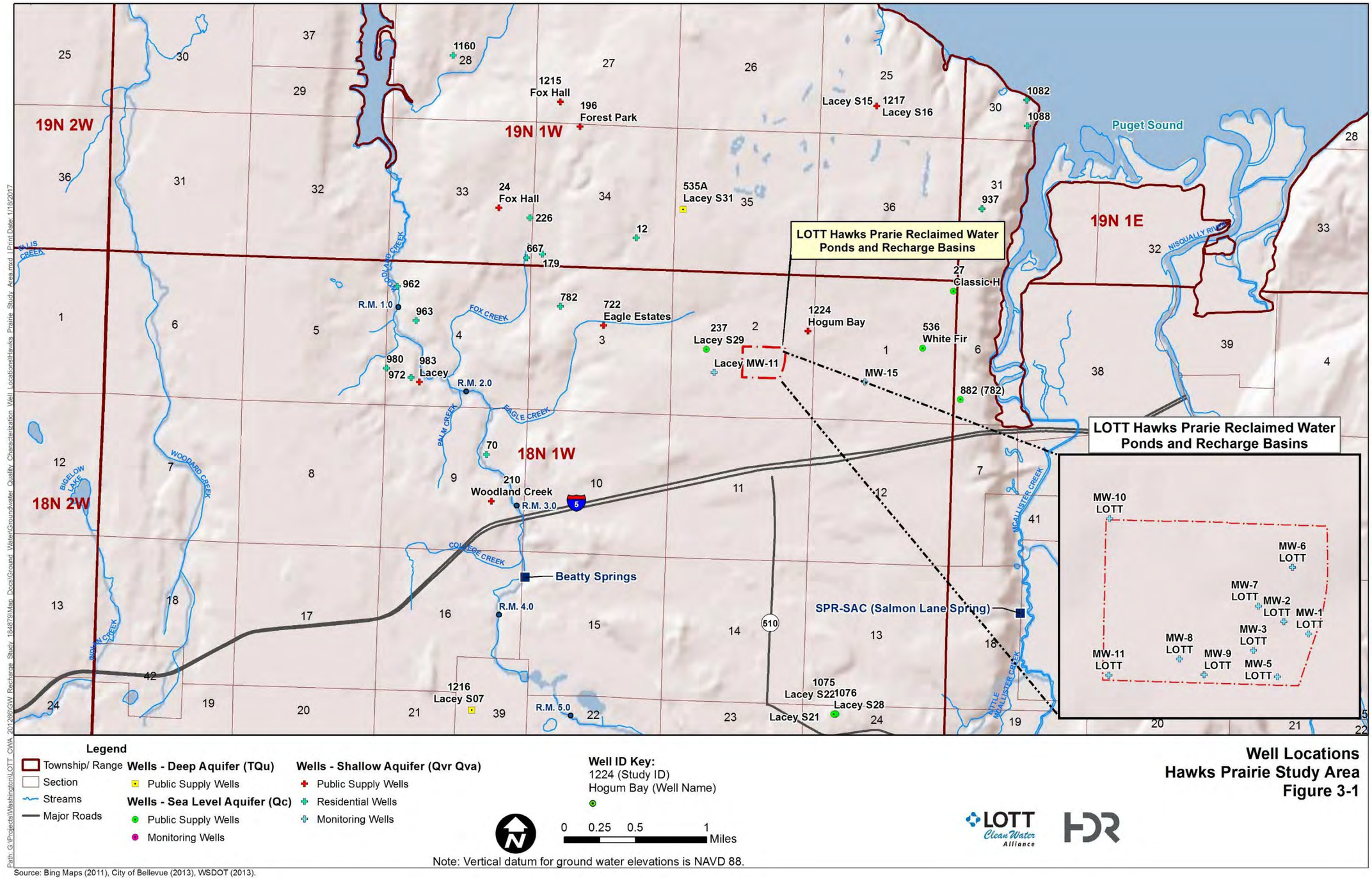
5) **Field Duplicates.** Field duplicates were collected to evaluate whether the results are reproducible. Field duplicates were in good agreement with the original sample.

Table 3-1. Groundwater analytical parameters and methods.

Parameter	Method	Sample Bottles & Preservative	Field Filtration
Residual Chemicals	LC-MS-MS	2 40 ml amber glass vial –sodium omadine & AA	No
Nitrate, nitrite	EPA 300. 351.1, 351.2	1 125 ml poly bottle – no preservative	No
Ammonia, TKN	EPA 350.1, 351.2	1 250 ml poly bottle – H2SO4	No
Dissolved total phosphorus. Dissolved orthophosphate	EPA 365.1/SM4500-P-E	1 250 ml poly- no preservative	Yes
Fecal coliform, total coliform, E. coli[2]	SM 9223	2 100 ml poly bottle – thio	No
Total organic carbon	SM 5310C	1 125 ml amber glass –H2SO4	No
Total sulfide	SM4500SD/376.2	1 x 250 ml poly plus ZnAC/NaOH	No
Chloride, Sulfate, Bromide	EPA 300.0	1 125 ml poly – no preservative	No
Metals (Ag, Al, As, B, Be, Ca, Cd, Cr, Cu, Fe, Hg, Pb, Mg, Mn, Na, Pb, Ni, Se, Sb, Si, Tl, Zn)	EPA 200 series	1 250 ml acid poly bottle – with HNO3	Yes
Total dissolved solids	SM 2540C	1 500 ml poly bottle – no preservative	No
Alkalinity/carbonate, hardness, pH, conductance	SM 2320B, SM 2340B, EPA 150.1, EPA 120.1	1 250 ml poly bottle – no preservative	No
Metformin and Thiabendazole	LC-MS-MS	2 40 ml amber glass vial –sodium omadine & AA	No
SVOCs	EPA 525.2	2 x 1 L amber glass plus sulfite (add HCL) or 2 x 1L amber glass plus HCL (non chlorinated)	No
VOCs	EPA 524.2	3 40 ml amber glass vials – ascorbic acid - add HCL in field or 3 x 40 ml amber glass plus HCl (non chlorinated)	No
PFOS/PFOA + Other PFCs	LC-MS-MS	1 x 250 ml polypro plus Trizma buffer	No
Pesticides	EPA 505	3 x 40 ml amber glass plus 1 drop thio (8%)	No
Herbicides	EPA 515.4	1 x 125 ml amber glass plus 7 mg sulfite	No

Notes:

1. Field parameters were also collected including pH, electrical conductance, dissolved oxygen, oxidation reduction potential (ORP) and temperature.
2. All samples were analyzed for total coliform. Due to lab error, some samples were analyzed for either fecal coliform or E. coli.


19N 2W
19N 1W
19N 1E
18N 2W
18N 1W
Puget Sound
LOTT Hawks Prarie Reclaimed Water Ponds and Recharge Basins
LOTT Hawks Prarie Reclaimed Water Ponds and Recharge Basins
1160
1215 Fox Hall
196 Forest Park
24 Fox Hall
226
535A Lacey S31
667
179
962
963
782
722 Eagle Estates
R.M. 1.0
980
983 Lacey
972
R.M. 2.0
70
210 Woodland Creek
R.M. 3.0
Beatty Springs
R.M. 4.0
1216 Lacey S07
R.M. 5.0
Lacey S15
1217 Lacey S16
1082
1088
937
27 Classic H
1224 Hogum Bay
237 Lacey S29
Lacey MW-11
MW-15
536 White Fir
882 (782)
SPR-SAC (Salmon Lane Spring)
1075 Lacey S22
1076 Lacey S28
Lacey S21
MW-10 LOTT
MW-6 LOTT
MW-7 LOTT
MW-2 LOTT
MW-1 LOTT
MW-3 LOTT
MW-8 LOTT
MW-9 LOTT
MW-5 LOTT
MW-11 LOTT
SILIS CREEK
FOX CREEK
PALM CREEK
EAGLE CREEK
WOODARD CREEK
BIGELOW LAKE
COLLEGE CREEK
INDIAN CREEK
NISQUALLY RIVER
MCALLISTER CREEK
LITTLE MCALLISTER CREEK
Legend
Township/ Range
Section
Streams
Major Roads
Wells - Deep Aquifer (TQu)
Public Supply Wells
Wells - Sea Level Aquifer (Qc)
Public Supply Wells
Monitoring Wells
Wells - Shallow Aquifer (Qvr Qva)
Public Supply Wells
Residential Wells
Monitoring Wells
Well ID Key:
1224 (Study ID)
Hogum Bay (Well Name)
0 0.25 0.5 1
Miles
Note: Vertical datum for ground water elevations is NAVD 88.
Well Locations
Hawks Prairie Study Area
Figure 3-1
LOTT Clean Water Alliance
HDR
Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).
Path: G:\Projects\Washington\LOTT_CWA_2012\66\GW_Recharge_Study_184679\Map_Docs\Ground_Water\GroundWater_Quality_Characterization_Well_Locations_Hawks_Prairie_Study_Area.mxd | Print Date: 1/18/2017

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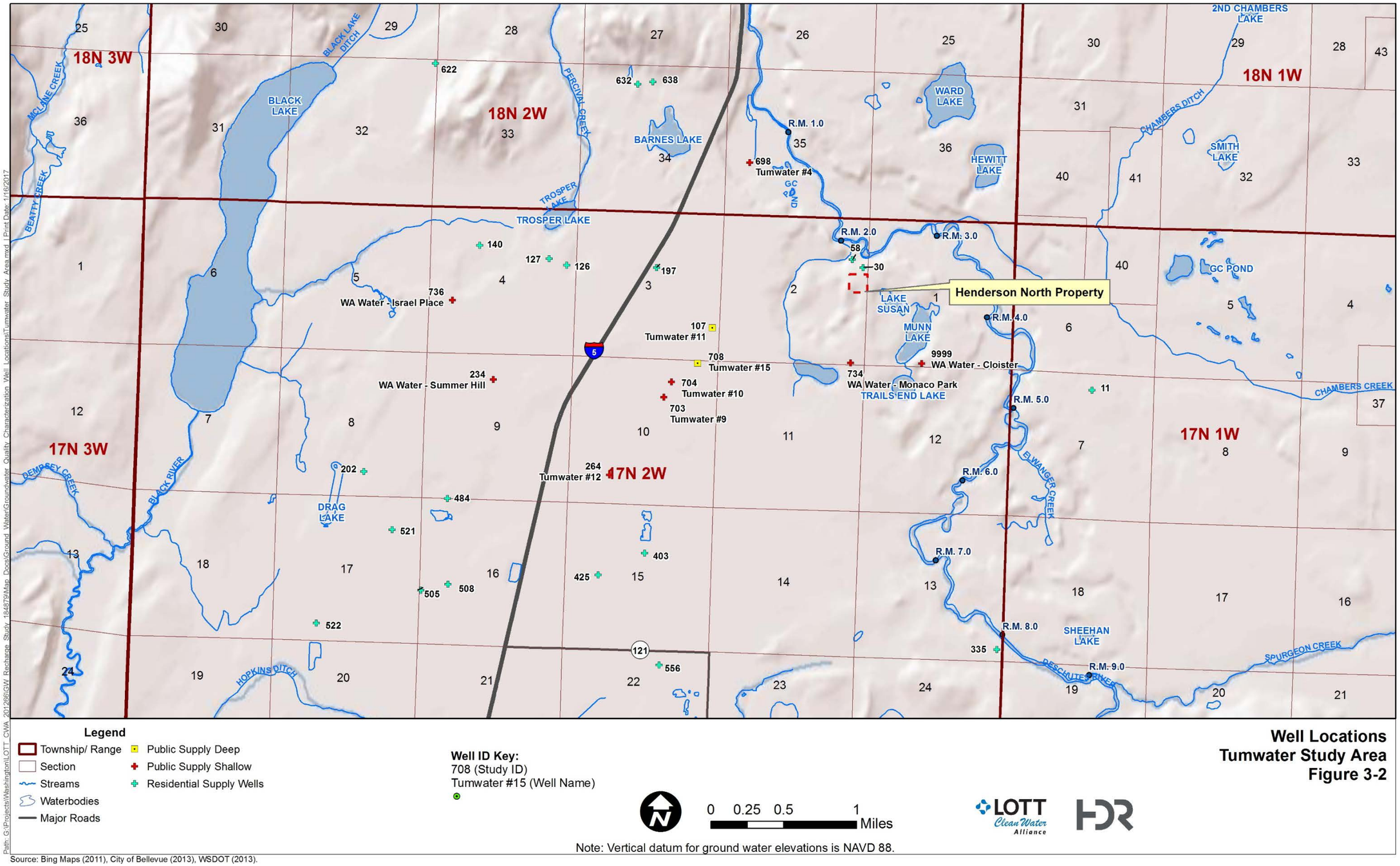
18N 3W
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18N 1W
17N 3W
17N 2W
17N 1W
BLACK LAKE
BARNES LAKE
WARD LAKE
HEWITT LAKE
SMITH LAKE
GC POND
LAKE SUSAN
MUNN LAKE
TROSPER LAKE
DRAG LAKE
SHEEHAN LAKE
TRAILS END LAKE
2ND CHAMBERS LAKE
BLACK LAKE DITCH
PERCIVAL CREEK
CHAMBERS DITCH
CHAMBERS CREEK
SPURGEON CREEK
MCLANE CREEK
BEATTY CREEK
BLACK RIVER
DEMPSEY CREEK
HOPKINS DITCH
EL WANGER CREEK
DESCHUTES RIVER
Henderson North Property
R.M. 1.0
R.M. 2.0
R.M. 3.0
R.M. 4.0
R.M. 5.0
R.M. 6.0
R.M. 7.0
R.M. 8.0
R.M. 9.0
622
632
638
698
Tumwater #4
140
127
126
197
58
30
736
WA Water - Israel Place
107
Tumwater #11
708
Tumwater #15
9999
WA Water - Cloister
234
WA Water - Summer Hill
704
Tumwater #10
734
WA Water - Monaco Park
703
Tumwater #9
11
202
264
Tumwater #12
484
521
403
425
505
508
522
556
335
121
5
Legend
Township/ Range
Section
Streams
Waterbodies
Major Roads
Public Supply Deep
Public Supply Shallow
Residential Supply Wells
Well ID Key:
708 (Study ID)
Tumwater #15 (Well Name)
0 0.25 0.5 1 Miles
Note: Vertical datum for ground water elevations is NAVD 88.
Well Locations
Tumwater Study Area
Figure 3-2
Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).
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4.0 Groundwater Quality Characterization Results

This section provides a summary of the results of the field investigations and sampling and laboratory analysis.

4.1 Hawks Prairie Study Area

4.1.1 Climate

The 2015 monthly precipitation and temperature, as well as average monthly data are shown on **Tables 2-1** and **2-2**. The annual total 2015 precipitation was slightly above average with November and December being very wet (up to about 2 times the average). Temperature during July and August in 2015 was about 10 degrees warmer than average.

4.1.2 Hawks Prairie Study Area Groundwater Levels and Flow Directions

Groundwater level measurements were collected from the study wells that were accessible. The well locations, well construction details, aquifer type and the groundwater level data for the wells that were sampled are presented in **Appendix B**. Groundwater level data on other public supply wells and monitoring wells was also compiled from the City of Lacey, Thurston County Landfill, and Washington Water Service Company, and was used to develop groundwater potentiometric surface contour maps for the Upper Aquifer, Sea Level Aquifer, and Deep Aquifer.

Groundwater potentiometric surface and flow directions for the Upper Aquifer are shown on **Figure 4-1**. A groundwater divide is present approximately along Hogum Bay Road and extending north. In the eastern area, groundwater flows east towards McAllister Creek. In the west, groundwater flows southwest towards Woodland Creek. Groundwater at the Hawks Prairie Ponds and Recharge Basins flows to the southwest. It is evident from the groundwater flow contours that groundwater in the western area discharges from the Upper Aquifer to Woodland Creek's lower reach downstream from Beatty Springs.

Groundwater potentiometric surface and flow directions in the Sea Level Aquifer are shown on **Figure 4-2**. Because the Nisqually River valley has eroded into the Sea Level Aquifer, groundwater flows towards and discharges to McAllister Creek to the east. Groundwater in the Sea Level Aquifer in the vicinity of the Hawks Prairie Ponds and Recharge Basins also flows to the east.

Figure 4-3 shows the groundwater potentiometric surface and flow direction in the Deep Aquifer. Regional groundwater flow in the Deep Aquifer is to the north towards Puget Sound.

Seasonal groundwater level fluctuations for two water supply production wells completed in the Upper and Sea Level Aquifers are shown on **Figure 4-4**. Seasonal groundwater fluctuations of up to 5 feet are observed in the Upper Aquifer, with higher groundwater levels during the winter and spring and lower groundwater levels during the summer and fall. **Figure 4-4** shows that In the Sea Level Aquifer seasonal groundwater fluctuations of up to 10 feet are observed. In the Deep Aquifer seasonal groundwater fluctuations of up to 30 feet are observed (**Figure 4-5**).

The reason the seasonal groundwater level fluctuations increase in the deeper aquifers is likely because they are confined and have a much lower aquifer storage coefficient, and the effects of increased pumping during the summer is more pronounced than in the Upper Aquifer. The hydraulic influence of Puget Sound tidal fluctuations on the Deep Aquifer groundwater levels are also observed in the hydrograph on **Figure 4-5**. The corresponding fluctuations in the Deep Aquifer groundwater levels in response to Puget Sound tidal changes are definitive evidence that the Deep Aquifer is hydraulically connected to and discharging into Puget Sound.

4.1.3 Hawks Prairie Study Area Groundwater Quality

The groundwater quality in the Hawks Prairie Study Area was determined by obtaining and analyzing groundwater samples from 13 residential wells, 1 monitoring well, 1 spring and 12 public supply wells. (For comparison purposes, data from four water samples obtained from Beatty Springs as part of Task 1.2 - Surface Water Quality Characterization are also shown and discussed.) Twenty-two of the 27 samples were collected from the Upper Aquifer and the remaining five were from the deeper aquifers. One duplicate sample was collected from Salmon Lane Spring.

The analytical parameters run on the groundwater samples in the laboratory include nutrients, bacteria bacteria(coliforms and E. coli), metals, other water quality indicator parameters and a variety of organic compound types including residual chemicals, polychlorinated bi-phenyls (PCBs), perfluorinated compounds (PFCs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and pesticides/herbicides. The residual chemical compound list and types is shown on **Table 4-1**. Field water quality monitoring data is presented in **Appendix C.** The data validation report documenting the data review process is included in **Appendix D**. Complete laboratory reports are included in **Appendix F** (provided as separate files).

The analytical results from the Hawks Prairie Study Area groundwater samples are presented in **Tables 4-2** to **4-5** for all inorganic parameters and those organic parameters with detections above the MRL. Tables with all of the results are presented in **Appendix E**. Figures illustrating the groundwater quality results for select parameters are presented on **Figures 4-6** to **4-15**.

The results below are compared to the Washington State drinking water standards (WAC 246-290), the Federal drinking water standards (40 CFR, Chapter I, Subchapter D, Part 141) and the Washington State groundwater quality standards (WAC 173-200-040).

4.1.3.1 Nutrients

The nitrogen species nitrate, nitrite, ammonia and total kjeldahl nitrogen (TKN) were analyzed. Phosphorus species include total dissolved phosphorus and orthophosphate. Nitrate-N groundwater concentrations in the Upper Aquifer ranged from less than 0.1 to 5.4 mg/L. Nitrate-N ranged from 2.6 to 3.3 mg/L in Beatty Springs and was reported at 1.1 mg/L at the Salmon Lane Spring. Total dissolved phosphorus ranged from 0.02 to 0.64 mg/L in groundwater wells, 0.052 mg/L at the Salmon Lane Spring and from below 0.02 to 0.052 mg/L in Beatty Springs.

Figure 4-6 shows the reported nitrate concentrations in the Upper Aquifer along with locations where properties have septic tanks. Nitrate and total dissolved phosphorus concentrations

generally increase to the west towards Woodland Creek. The elevated nutrient concentrations are mainly in the more densely populated areas with septic tanks, although there are obvious exceptions.

In the five public supply wells sampled in the deeper aquifers, nitrate-N concentrations ranged from below 0.1 mg/L to 2.9 mg/L and dissolved total phosphorus concentrations ranged from 0.1 to 0.28 mg/L, and the results are shown graphically on **Figure 4-7**. A box and whisker plot of the nutrient concentrations for all wells sampled is shown on **Figure 4.8**.

Nutrient concentrations measured in November 2013 at the Hawks Prairie Ponds and Recharge Basins (almost a year after reclaimed water recharge had been "off") were similar to the concentrations measured in the Hawks Prairie Study Area, as shown on the box and whisker plots on **Figure 4-8** and **4-9**. Nitrate-N concentrations were slightly higher at the infiltration facility compared to regional groundwater results and phosphorus concentrations were slightly lower.

4.1.3.2 Indicator Bacteria

Indicator bacteria are typically not pathogen, but their presence may be associated with disease causing microbes. Indicator bacteria include total coliform, fecal coliform and *E coli. E. coli* and fecal coliform indicate the presence of feces from warm blooded animals.

Indicator bacteria were detected in two residential shallow wells, one municipal shallow well (details below), and at the Salmon Lane Spring. In addition, indicator bacteria were detected at Beatty Springs during surface water sampling events. Sample results are reported as "most probable number per 100 ml (MPN/100 mL). Total coliform bacteria were detected at concentrations of >23 MPN/100 mL and 140 MPN/100 mL in residential shallow well samples DOM667 and RES963, respectively. *E. coli* bacteria and total coliform bacteria were detected at concentrations of 1.1 MPN/100 mL and 6.9 MPN/100 mL in the shallow municipal well sample MUN210. *E. coli* bacteria and total coliform bacteria were detected as being present but the detection limit for both parameters was poor and the samples were only enumerated at >23 MPN/100 mL. At Beatty Springs, fecal coliform was detected at a concentration of 1 MPN/100 mL in 2 of 4 samples and total coliform was detected at concentrations ranging from 66 to 100 MPN/100mL in all samples collected during the surface water study.

4.1.3.3 Water Quality Indicator Parameters

Groundwater quality in the Hawks Prairie Study Area is generally good and, in almost all cases (exceptions noted below), meets the State and Federal drinking water quality standards and State groundwater quality standards. Alkalinity and total dissolved solids are low, ranging between 44 to 150 mg/L and 90 and 230 mg/L, respectively. Chloride and sulfate/sulfide are also very low. The Piper diagrams on **Figures 4-10** to **4-11** show thepredominate cations are calcium and magnesium and the predominate anion is bicarbonate. Almost all samples have similar predominate cations and anions indicating similar geochemistry throughout the area. These results indicate relatively young groundwater that has a high recharge rate and rapid flushing. Groundwater with less recharge and less residence time (older) typically exhibits a

larger relative concentration of sodium, potassium and chloride and a higher concentration of alkalinity, total dissolved solids and sulfate/sulfide.

4.1.3.4 Metals

Concentrations of metals were low and indicate relatively young waters with little dissolution of metallic compounds in groundwater. Almost all metal concentrations were below the Federal and State drinking water standards and State groundwater quality standards (exceptions noted below). Arsenic was detected at 28 micrograms per liter (ug/L) at residential well 962, above the Federal and State drinking water standard of 10 ug/L. Almost all arsenic results were greater than the State groundwater quality standard criteria of 0.05 ug/L, however, it should be noted that this criterion is much lower than the Federal drinking water standard.. Iron and manganese were also reported above the Federal and State drinking water standards at two and ten wells, respectively. Iron and manganese are secondary drinking water contaminants and staining of clothes during washing, color, and taste are the major issues associated with these compounds.

4.1.3.5 Residual Chemicals

Hawks Prairie Study Area Wells

The residual chemicals identified in the Hawks Prairie Study Area wells and in Salmon Lane Spring are shown on **Tables 4-2** to **4-3** and in the box and whisker plot on **Figure 4-12**. For comparison, data from Beatty Springs are shown in **Table 4-4**. The residual chemicals most-frequently detected were the sweeteners acesulfame-K and sucralose (11 and 7 detections, respectively) at concentrations of up to 1,900 nanograms per liter (ng/L) and 710 ng/L, respectively. The next most-frequent residual compounds detected were the flame retardant TCPP, detected four times at concentrations up to 150 ng/L, and the herbicide cyanazine, also detected four times, at concentrations up to 15 ng/L.

Compounds detected twice were azithromycin (antibiotic), BPA (plasticizer chemical), erythromycin (antibiotic), metformin (antidiabetic pharmaceutical), and quinoline (phosphate pesticide). Compounds detected once included 4-tert-octylphenol (surfactant), atenolol (blood pressure pharmaceutical), gemfibrozil (high cholesterol medication, propazine (herbicide), and propylparaben (a preservative).

Hawks Prairie Ponds and Recharge Basins

The residual chemicals identified at the Hawks Prairie Ponds and Recharge Basins groundwater monitoring wells in November 2013 are summarized on **Table 4-5** and on the plot on **Figure 4-13**. The two sweetener compounds acesulfame-K and sucralose were detected at higher concentrations (up to 23,000 and 10,000 ng/L, respectively) in the Hawks Prairie Ponds and Recharge Basin groundwater monitoring wells than the concentrations identified in the regional groundwater samples from public supply and residential wells. The concentrations of these compounds are higher in the monitoring wells further downgradient from the rapid infiltration basins. The pharmaceuticals carbamazepine (an anti-seizure drug) and sulfamethoxazole (an antibiotic) were also detected in the monitoring wells on the LOTT Hawks

Prairie property at higher concentrations and more frequently than the regional public supply and residential wells. Carbamazepine (anti-seizure pharmaceutical) had six detections up to 78 ng/L in eight samples and sulfamethoxazole (antibiotic pharmaceutical) was detected in four of eight samples at up to 110 ng/L. Primidone (anti-convulsant pharmaceutical) was reported with four detections in eight samples at concentrations up 52 ug/L. The compound 1,4-dioxane (an industrial solvent) also was uniquely detected at three samples at concentrations up to 0.395 ug/L. Albuterol (anti-asthmatic medicine) was detected in two samples at concentrations up to 31 ng/L. BPA (a plasticizer) was detected in one sample at a concentration of 53 ug/L. The flame retardants TCEP and TDCPP were also detected at up to 36 and 960 ng/L with two and one detections, respectively.

Correlations between Acesulfame-K, Sucralose, and Nitrate

The results for acesulfame-k and sucralose from the Hawks Prairie Study Area wells and the Hawks Prairie Ponds and Recharge Basins wells were plotted against nitrate and chloride concentrations in an x/y scatterplot. Acesulfame-k and sucralose were the most-commonly detected and at the highest concentrations of all of the residual compounds and chloride and nitrate are compounds commonly found in wastewater and septic discharges. The results are shown on **Figure 4-14** and **4-15**. A moderately positive correlation (Spearman's correlation coefficient between 0.4 and 0.6) is evident for wells in the Hawks Prairie Study Area, indicating that the increase in the residual compounds is associated with elevated nitrate and chloride. At the Hawks Prairie Ponds and Recharge Basins a strong positive correlation was evident between the residual chemicals and chloride, but the correlation between residual chemicals and nitrate is weak.

4.1.3.6 Other Organic Parameters

Of the other organic parameters analyzed, including PFCs, DBPs, PCBs, VOCs and SVOCs all results were below method detection limits, except for di(2-ethylhexyl)phthalate at 1.2 ug/L.

4.2 Tumwater Study Area

4.2.1 Climate

The climate in the Tumwater Study Area during the 2015 study period is similar to the Hawks Prairie Study Area. See Section 4.1.1 above.

4.2.2 Tumwater Study Area Groundwater Levels and Flow Directions

Groundwater level data was measured in the Tumwater Study Area study wells (**Appendix B**). Groundwater level data was also compiled from the City of Tumwater for their monitoring wells in the area. The groundwater potentiometric surface contours for the Upper Aquifer are shown on **Figure 4-16**. Groundwater in the area flows to the northeast to the Deschutes River. The lower (north) reach of the Deschutes River in the study area is a gaining river with groundwater discharging into the river. It is also evident from the potentiometric surface map that the groundwater in Munn Lake, Barnes Lake and the other "kettle" lakes in the study area are a reflection of groundwater levels.

The seasonal groundwater level fluctuations from four City of Tumwater monitoring wells are shown on **Figure 4-17**. Seasonal groundwater fluctuations are generally within 5 to 10 feet. Groundwater levels in the Upper Aquifer are not affected by Puget Sound tidal fluctuations. No groundwater level data was available for the deeper aquifers in the Tumwater Study Area.

4.2.3 Tumwater Study Area Groundwater Quality

Groundwater samples were obtained from 20 residential wells and 10 public supply wells with all of the samples collected from wells completed in the Upper Aquifer. The same analytical parameters were run on the samples as in the Hawks Prairie Study Area and shown on **Table 4-1**. The analytical results from the Tumwater Study Area groundwater quality sampling is presented on **Tables 4-6** and **4-7**. Figures illustrating the groundwater quality results are shown on **Figures 4-18** to **4-23**.

4.2.3.1 Nutrients

Groundwater concentrations of nitrate-N ranged from less than 0.1 to 6.5 mg/L (the nitrate-N groundwater quality standard is 10 mg/L). Total dissolved phosphorus ranged from below 0.02 to 0.13 mg/L. **Figure 4-18** graphically shows the locations where elevated nitrate and phosphorus were measured in groundwater compared to properties with septic tanks. With one exception, nitrate concentrations above 2 mg/L were all in areas with septic tanks. Nitrate and phosphorus concentrations are also shown on the graph on **Figure 4-19**.

4.2.3.2 Indicator Bacteria

Fecal coliform bacteria were detected in one groundwater sample from a residential well. Coliform bacteria were detected in eight of the wells sampled (7 residential wells and 1 public supply well).

4.2.3.3 Metals

Concentrations of metals were low and indicate relatively young waters with little mineralization. Almost all metal concentrations were below the Federal and State drinking water standards and State groundwater quality standards (exceptions noted below). Arsenic was detected in five wells above detection limits at 1.2 to 1.7 ug/L. This concentration is above the 0.05 ug/L State groundwater quality standard, but well below the 10 ug/L State and Federal drinking water standards. Iron was identified above the drinking water standard of 0.3 mg/L in three wells at concentrations ranging from 0.31 to 0.93 mg/L. Manganese was detected above the drinking water standard of 50 ug/L in four wells at concentrations ranging from 110 to 330 ug/L. Iron and manganese are secondary contaminants and staining of clothes during washing, color and taste are the major issues associated with these compounds.

4.2.3.4 Water Quality Indicator Parameters

The analytical results for the Tumwater Study Area indicates that groundwater quality is good. With few exceptions, the groundwater quality results meet the Washington State and Federal drinking water standards and the Washington State groundwater quality standards. The groundwater quality data indicates very low chloride (2.8 to 5.9 mg/L), alkalinity (30 to 90 mg/L) and total dissolved solids (71 to 160 mg/L). The predominate groundwater cations are calcium and magnesium and the predominate anion is bicarbonate, as shown on the Piper diagrams for

the residential and public supply wells shown on **Figures 4-20** to **4-21**. The groundwater quality results indicate a relatively young groundwater that is regularly recharged by precipitation.

4.2.3.5 Residual Chemicals

The residual chemicals detected in the Tumwater Study Area wells are shown on **Table 4-6** to **4-7** and on the graph on **Figure 4-22**. The most commonly detected compounds at the highest concentrations were acesulfame-K and sucralose (sweeteners) with 15 and 9 detections, respectively, and at concentrations for both at up to 1,500 ng/L. Metformin (anti-diabetic pharmaceutical) was detected in five wells at concentrations up to 840 ng/L. Cyanazine (herbicide) was detected at in four wells at concentrations up to 12 ng/L. Single detections of 4-nonylphenol (surfactant), carbamazepine (anti-seizure pharmaceutical) and TCEP (flame retardant) were in the range of 50 to 100 ng/L. Other compounds with single detections at lower concentrations (5 to 10 ng/L) include caffeine (stimulant), chloridazon (herbicide) and fluoxetine (anti-depressant pharmaceutical).

An evaluation was conducted to determine if a positive correlation exists between the most-common residual chemicals detected in groundwater (acesulfame-K and sucralose) and nitrate and chloride. The results are shown on x/y scatterplots on **Figure 4-23**, which indicate a weak correlation between residual chemicals and nitrate and chloride (Spearman's correlation coefficient of less than 0.5).

Table 4-1. Residual chemical compounds and classifications.

Parameter	Compound Class	Parameter	Compound Class
1,7-dimethylxanthine	Caffeine Degradate	Ibuprofen	Analgesic-NSAID
2,4-D	Herbicide	Iohexol (Iohexal)	X-ray Contrast agent
4-nonylphenol	Surfactant	Iopromide	X-ray Contrast agent
4-tert-octylphenol	Surfactant	Isobutylparaben	Preservative
Acesulfame-K	Sugar Substitute	Isoproturon	Herbicide
Acetaminophen	Analgesic	Ketoprofen	Anti Inflammatory
Albuterol	Anti Asthmatic	Ketorolac	Anti Inflammatory
Amoxicillin	Antibiotic	Lidocaine	Analgesic
Andorostenedione	Steroid Hormone	Lincomycin	Antibiotic
Atenolol	Beta Blocker	Linuron	Herbicide
Atrazine	Triazine Herbicide	Lopressor	Beta Blocker
Azithromycin	Antibiotic	Meclofenamic Acid	Anti Inflammatory
Bendroflumethiazide	Triazide	Meprobamate	Anti anxiety
Bezafibrate	Lipid Regulator	Metformin	Antidiabetic
BPA (Bis Phenol A)	Plasticizer	Metazachlor	Herbicide
Bromacil	Herbicide	Methylparaben	Preservative
Butalbital	Analgesic-NSAID	Naproxen	Analgesic-NSAID
Butylparben	Preservative	Nifedipine	Calcium Blocker
Caffeine	Stimulant	Norethisterone	Steroid Hormone
Carbadox	Antibiotic	OUST (sulfameturaon methyl)	Herbicide
Carbamazepine	Anti seizure	Oxolinic acid	Antibiotic
Carisoprodol	Muscle Relaxant	Pentoxifylline	Blood thinner
Chloramphenicol	Antibiotic	Phenazone	analgesic
Chloridazon	Herbicide	Primidone	Anti Convulsant
Chlorotoluron	Herbicide	Progesterone	Steroid Hormone
Cimetidine	H2 Blocker	Propazine	Triazine Herbicide
Clofibric Acid	Herbicide/ Cholestrol drug	Propylparaben	Preservative
Cotinine	Nicotine Degradate	Quinoline	Pesticide/Ind Chem
Cyanazine	Triazine Herbicide	Simazine	Triazine Herbicide
DACT (Diaminochlorotriazine)	Triazine Degradate	Sucralose	Sugar Substitute
DEA (Deethylatrazine)	Triazine Degradate	Sulfachloropyridazine	Sulfa Antibiotic
DEET (N,N-Diethyl-meta-toluamide)	Mosquito Repellant	Sulfadiazine	Sulfa Antibiotic
Dehydronifedipine	blood pressure drug metabolite	Sulfadimethoxine	Sulfa Antibiotic
DIA (Deisopropylatrazine)	Triazine Degradate	Sulfamerazine	Sulfa Antibiotic
Diazepam	Valium- Antianxiety	Sulfamethazine	Sulfa Antibiotic
Diclofenac	Anti-Inflammatory	Sulfamethizole	Sulfa Antibiotic
Dilantin	Anti-Seizure	Sulfamethoxazole	Sulfa Antibiotic

Parameter	Compound Class	Parameter	Compound Class
Diltiazem	Vasodilator	Sulfathiazole	Sulfa Antibiotic
Diuron	Herbicide	TCEP	Flame Retardant
E2 (17 Beta-Estradiol)	Estrogenic Hormone	TCPP	Flame Retardant
EE2 (17 Alpha-ethynylestradiol)	Contraceptive Hormone	TDCPP	Flame Retardant
Erythromycin	Antibiotic	Testosterone	Steroid Hormone
Estradiol	Estrogenic Horomone	Theobromine	Caffeine Degradate
Estrone	Estrogenic Hormone	Theophylline	Anti Asthmatic
Ethinyl Estradiol - 17 alpha	Estrogenic Hormone	Thiabendazole	Anthelmintic
Ethylparaben	Preservative	Triclocarban	Antibacterial
Flumeqine	Antibiotic	Triclosan	Antibacterial
Fluoxetine	Antidepressant	Trimethoprim	Antibiotic
Furosemide	Diuretic	Warfarin	Anticoagulant
Gemfibrozil	Lipid Regulator		

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Table 4-2. Summary groundwater quality analytical results from Hawks Prairie Study Area residential wells and Thurston County Landfill monitoring well MW-15 (see Appendix E for full results).

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/15	5/1/15	5/12/15	4/24/15	6/2/15	6/5/15	4/27/15	4/29/15	4/23/15	6/4/15	5/3/16	4/23/15	5/1/15		6/3/15
General Water Quality Parameters																			
Bicarbonate Alkalinity (as HCO_3)	mg/L	2	N/A	N/A	77	150	97	70	92	54	100	120	160	77	100	180	78		58
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	64	120	80	58	75	44	83	100	130	63	85	150	64		48
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Specific Conductance	umho/cm	2	N/A	N/A	170	270	240	130	220	140	200	200	270	180	200	1400	150		130
Total Dissolved Solids (TDS)	mg/L	10	500	500	130	180	160	100	150	110	130	130	180	140	140	770	110		90
Total Organic Carbon	mg/L	0.3	N/A	N/A	ND	ND	ND	0.3	0.49	0.33	0.34	0.67	0.5	0.68	4	1.2	0.3		0.3
Bromide	µg/L	5	N/A	N/A	11	43	49	8	29	14	13	15	16	16	25	870	10		12
Chloride	mg/L	1	250	250	3.6	4.3	13	2.2	4.4	3.5	5.2	2.4	2.6	4.8	5.2	320	2.6		2.2
Sulfate	mg/L	0.5	250	250	6.6	10	6.9	5.2	4.7	12	7.4	ND	9.9	9.8	3	44	8.1		11
Sulfide	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	47	120	99	54	88	52	84	71	130	75	85	240	58		48
Metals (Dissolved)*																			
Aluminum	µg/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Antimony	µg/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Arsenic	µg/L	1	10	0.05	ND	1.3	ND	ND	ND	2.5	ND	28	3.8	ND	2.3	1.1	2.6		3.6
Barium	µg/L	2	2000	1000	2.2	9.3	4.8	4.6	4.2	4.1	3.9	8	14	6	8	17	7.5		4.7
Beryllium	µg/L	1	4	N/A	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ		ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.094	ND		ND
Cadmium	µg/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Calcium	mg/L	1	N/A	N/A	10	20	20	11	17	7.1	17	18	20	16	19	24	8.7		9.2
Chromium	µg/L	1	100	50	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Copper	µg/L	2	1300	1000	ND	2.8	9.7	7.7	17	ND	3.1	ND	ND	5.3	2.7	5.2	5		ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	0.082	ND	0.037	0.025	ND	0.046	1.6	ND	10	0.095	0.26		0.12
Lead	µg/L	0.5	15	50	ND	ND	ND	0.7	0.96	ND	ND	ND	ND	ND	ND	ND	1.2		ND
Magnesium	mg/L	0.1	N/A	N/A	5.4	16	12	6.5	11	8.4	10	6.4	20	8.6	9.1	45	8.9		6.1
Manganese	µg/L	2	50	50	ND	4	ND	ND	6.6	7.8	2.1	100	230	83	580	67	250		87
Mercury	µg/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Nickel	µg/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Potassium	mg/L	1	N/A	N/A	2.1	2.4	1.6	1.1	1.5	1.9	1.6	4.7	2.7	1.6	1.8	12	2.3		1.9
Selenium	µg/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND		ND
Silica	mg/L	0.428	N/A	N/A	31	35	37	38	43	28	36	45	47	36	50	67	45		34
Silver	µg/L	0.5	100	N/A	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND		ND
Sodium	mg/L	1	N/A	N/A	100	8.5	8.7	6.1	9.1	5	7.7	14	8.3	6.7	8.4	180	6		4.9
Thallium	µg/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Zinc	µg/L	20	5000	5000	130	30	ND	110	36	ND	ND	ND	ND	ND	ND	69	ND		ND
Nutrients																			
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	1.7	1.1	2.7	0.23	5.2	0.37	1.3	ND	ND	2.4	0.26	1.8	ND		ND
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	7.4	4.9	12	1	23	1.6	6	ND	ND	10	1.2	7.9	ND		ND
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	1.7	1.1	2.7	0.23	5.2	0.37	1.3	ND	ND	2.3	0.26	1.8	ND		ND
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.057	ND	ND	ND		ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	0.16	ND	ND	ND	ND	ND	0.25	ND	ND	0.17	ND	ND		0.35
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	0.25	ND	ND	0.45	ND	ND		0.34
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.05	0.071	0.078	0.08	0.11	0.072	0.064	0.64	0.047	0.095	0.2 J-	0.1	0.092		0.12
Orthophosphate (as P)	mg/L	0.01	N/A	N/A	ND	0.021	0.02	0.025	0.022	0.026	0.029	0.52	0.07	0.013	0.14	0.083	0.045		0.045

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/15	5/1/15	5/12/15	4/24/15	6/2/15	6/5/15	4/27/15	4/29/15	4/23/15	6/4/15	5/3/16	4/23/15	5/1/15	6/3/15	
Residual Chemicals																			
4-tert-octylphenol	ng/L	50	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Acesulfame-K	ng/L	20	N/A	N/A	ND	ND	ND	ND	210	ND	ND	ND	ND	ND	51	86	ND	ND	
Atenolol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	
Azithromycin	ng/L	20	N/A	N/A	--	--	ND UJ	--	ND UJ	ND UJ	--	--	--	ND UJ	ND UJ	--	--	ND UJ	
BPA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	10	ND	ND	
Cyanazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	13	15	ND	ND	
Erythromycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Gemfibrozil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Metformin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Propazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.7	ND	ND	
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	ND	
Quinoline	ng/L	5	N/A	N/A	ND	ND	ND	ND	9.5	ND	ND	ND	ND	11	ND	ND	ND	ND	
Simazine	ng/L	5	4000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Sucralose	ng/L	100	N/A	N/A	ND	ND	110	ND	130	ND	ND	ND	ND	ND	ND	100	ND	ND	
TCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
TDCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
PFCs																			
Perfluoro octanesulfonic acid - PFOS	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND	ND	
Perfluoro octanesulfonate-PFOS	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND	ND	
Perfluoro-1-butanesulfonate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	
Perfluoro-1-butanesulfonic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	
DBPs																			
Chloroform (Trichloromethane)	µg/L	0.5	N/A	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromoform	µg/L	0.5	N/A	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromodichloromethane	µg/L	0.5	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chlorodibromomethane	µg/L	0.5	N/A	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total THM	µg/L	0.5	80	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bacteria																			
E. Coli Bacteria (P/A)	P/A	N/A	N/A	N/A	--	A UJ	A UJ	--	A UJ	A UJ	A UJ	A UJ	--	A UJ	A	--	A UJ	A UJ	
E. Coli Bacteria	MPN/ 100 mL	1.1	N/A	N/A	--	<1.1 J	<1.1 J	--	<1.1 J	<1.1 J	<1.1 J	<1.1 J	--	<1.1 J	<1	--	<1.1 J	<1.1 J	
Total Coliform Bacteria (P/A)	P/A	N/A	N/A	N/A	--	A UJ	A UJ	--	P J	A UJ	A UJ	A UJ	--	A UJ	A	--	A UJ	A UJ	
Total Coliform Bacteria	MPN/ 100 mL	1.1	N/A	N/A	<1	<1.1 J	<1.1 J	<1	>23 J	<1.1 J	<1.1 J	<1.1 J	140	<1.1 J	<1	<1	<1.1 J	<1.1 J	
Other Organics																			
Total PCBs	µg/L	0.1	0.5	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Pesticides and Herbicides																			
All Pesticides and Herbicides					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
VOCs																			
All VOCs					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells
																		MW-15
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	Thurston Cty Public Works
					4/24/15	5/1/15	5/12/15	4/24/15	6/2/15	6/5/15	4/27/15	4/29/15	4/23/15	6/4/15	5/3/16	4/23/15	5/1/15	6/3/15
SVOCs																		
All SVOCs					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl; PBDE = Polybrominated Diphenyl Ether; P = present; A = absent
VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound

(1) Drinking Water Standards established by the Washington State Department of Health in 246-290 WAC. Includes Federal MCL Drinking Water Standards.

(2) Groundwater Quality Standard: Established by the Washington State Department of Ecology in WAC 173-200-040.

J = Value is detected and the result is estimated

J- = Value is detected and the result is estimated and biased low

UJ = Result is a non-detect and the value is estimated

R = Result rejected

*Drinking water and groundwater quality standards are for total metals.

Table 4-3. Summary groundwater quality analytical results from Hawks Prairie Study Area municipal wells and Salmon Lane Spring (see Appendix E for detailed results).

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Municipal Wells Shallow Aquifer						Municipal Wells Deeper Aquifers						Springs	
					MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN210	MUN882	MUN237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
					Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water # 1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					5/7/2015	5/7/2015	5/7/2015	5/18/2015	5/7/2015	5/3/2016	5/27/2015	5/7/2015	5/6/2015	5/3/2016	5/6/2015	5/6/2015	6/4/2015	6/4/2015
General Water Quality Parameters																		
Bicarbonate Alkalinity (as HCO_3)	mg/L	2	N/A	N/A	63	90	99	65	85	110	160	180	160	46	79	100	52	52
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	51	74	81	54	70	93	130	150	140	38	65	83	43	43
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	umho/cm	2	N/A	N/A	130	190	220	140	230	250	300	370	330	86	180	200	120	120
Total Dissolved Solids (TDS)	mg/L	10	500	500	110	100	130	99	160	150	180	230	190	83	120	130	110	100
Total Organic Carbon	mg/L	0.3	N/A	N/A	0.36	0.3	ND	ND	0.34	ND	0.39	0.31	0.54	0.41	ND	0.32	1.7	1.5
Bromide	µg/L	5	N/A	N/A	5.9	25	20	16	19	21	50	88	38	5.1	18	19	5.8	5.8
Chloride	mg/L	1	250	250	2.1	3.8	4.4	3.6	8.4	6.7	4.5	12	14	1.4	4.8	4.2	3.3	3.3
Sulfate	mg/L	0.5	250	250	6.4	7.8	7.8	5.7	9.9	10	11	11	11	2.2	7.4	12	7.1	7.1
Sulfide	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	46	76	88	52	89	110	120	160	140	29	73	83	47	44
Metals (Dissolved)*																		
Aluminum	µg/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	µg/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	µg/L	1	10	0.05	3.4	ND	ND	ND	ND	ND	1.3	1.2	1.1	ND	ND	2.4	ND	ND
Barium	µg/L	2	2000	1000	4.3	3.4	3.9	3.5	4.2	4.9	12	5.3	9.6	4.4	2.9	12	3.2	3.1
Beryllium	µg/L	1	4	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	µg/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	N/A	N/A	7.8	14	17	10	20	22	24	32	23	5.5	16	12	11	10
Chromium	µg/L	1	100	50	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	µg/L	2	1300	1000	ND	ND	ND	ND	ND	ND	3.7	3.4	4.7	ND	11	ND	ND	ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	ND	ND	ND	ND	0.054	ND	ND	0.34	ND	0.49	0.025	0.041
Lead	µg/L	0.5	15	50	ND	ND	ND	ND	0.52	ND	ND	ND	0.72	ND	1.8	ND	ND	ND
Magnesium	mg/L	0.1	N/A	N/A	6.5	9.9	11	6.5	9.5	13	15	19	20	3.8	8	13	4.8	4.6
Manganese	µg/L	2	50	50	4.8	ND	ND	ND	ND	4.8	130	98	ND	84	ND	500	2.7	2.8
Mercury	µg/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.24	ND	ND
Nickel	µg/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	5.9	ND	ND	6.1	ND	ND
Potassium	mg/L	1	N/A	N/A	2	1.9	2	1.4	1.8	2	2.5	3.2	3.4	1.3	1.7	3.7	ND	ND
Selenium	µg/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.428	N/A	N/A	37	36	38	29	25	34	34	40	37	56	39	47	29	27
Silver	µg/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	5.8	7.2	7.8	5.1	8.3	8	7.4	10	11	5.6	6.6	7.1	5.5	5.3
Thallium	µg/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	µg/L	20	5000	5000	ND	ND	ND	100	ND	ND	ND	140	20	ND	68	ND	ND	ND
Nutrients																		
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	0.25	1.5	2.9	0.44	5.4	2.4	0.45	2.1	0.37	ND	2.9	ND	1.1	1.1
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	1.1	6.8	13	2	24	11	2	9.1	1.6	ND	13	ND	5	5
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	0.25	1.5	2.9	0.44	5.4	2.4	0.45	2.1	0.37	ND	2.9	ND	1.1	1.1
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.32	0.31
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.13	0.085	0.073	0.1	0.084	ND UJ	0.1	0.15	0.081	ND UJ	0.12	0.1	--	0.052
Orthophosphate (as P)	mg/L	0.01	N/A	N/A	0.072	0.032	0.024	0.026	0.014	0.087	0.033	0.076	0.037	0.26	0.048	0.047	--	0.015

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Municipal Wells Shallow Aquifer						Municipal Wells Deeper Aquifers						Springs	
					MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN210	MUN882	MUN237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
					Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water # 1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					5/7/2015	5/7/2015	5/7/2015	5/18/2015	5/7/2015	5/3/2016	5/27/2015	5/7/2015	5/6/2015	5/3/2016	5/6/2015	5/6/2015	6/4/2015	6/4/2015
Residual Chemicals																		
4-tert-octylphenol	ng/L	50	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	57	ND	ND	ND
Acesulfame-K	ng/L	20	N/A	N/A	ND	25	140	ND	1900	410	ND	190	1600	ND	200	ND	87	76
Atenolol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Azithromycin	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	160 J	ND UJ	ND UJ	ND UJ	200 J	ND UJ	ND UJ	ND UJ	ND UJ
BPA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6	ND	ND	ND	ND
Erythromycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	12 J-	ND	ND	19 J+	ND	ND	ND
Gemfibrozil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.9	ND	ND	ND	ND
Metformin	ng/L	10	N/A	N/A	--	--	--	98	--	--	ND	--	--	--	--	--	54	56
Propazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quinoline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
Simazine	ng/L	5	4000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sucralose	ng/L	100	N/A	N/A	ND	ND	ND	ND	710	ND	ND	ND	600	ND	150	ND	170	140
TCPP	ng/L	100	N/A	N/A	150	120	120	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
TDCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	310
PFCs																		
Perfluoro octanesulfonic acid - PFOS	ng/L	5	N/A	N/A	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro octanesulfonate-PFOS	ng/L	5	N/A	N/A	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-1-butanesulfonate	ng/L	5	N/A	N/A	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-1-butanesulfonic acid	ng/L	5	N/A	N/A	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
DBPs																		
Chloroform (Trichloromethane)	µg/L	0.5	N/A	7	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromoform	µg/L	0.5	N/A	5	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromodichloromethane	µg/L	0.5	N/A	0.3	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chlorodibromomethane	µg/L	0.5	N/A	0.5	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Total THM	µg/L	0.5	80	N/A	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bacteria																		
E. Coli Bacteria (P/A)	P/A	NA	N/A	N/A	A UJ	A UJ	A UJ	A UJ	A UJ	A	P J	A UJ	A UJ	A	A UJ	A UJ	P J	P J
E. Coli Bacteria	MPN/ 100 mL	1.1	N/A	N/A	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1	1.1 J	<1.1 J	<1.1 J	<1	<1.1 J	<1.1 J	>23 J	>23 J
Total Coliform Bacteria (P/A)	P/A	N/A	N/A	N/A	A UJ	A UJ	A UJ	A UJ	A UJ	A	P J	A UJ	A UJ	A	A UJ	A UJ	P J	P J
Total Coliform Bacteria	MPN/ 100 mL	1.1	N/A	N/A	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1	6.9 J	<1.1 J	<1.1 J	<1	<1.1 J	<1.1 J	>23 J	>23 J
Other Organics																		
Total PCBs	µg/L	0.1	0.5	0.01	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Pesticides and Herbicides																		
All Pesticides and Herbicides					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VOCs																		
All VOCs					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Units	MRL	Drinking Water Standard(1)	Ground-water Quality Standard(2)	Municipal Wells Shallow Aquifer						Municipal Wells Deeper Aquifers						Springs	
					MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN210	MUN882	MUN237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
					Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water # 1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					5/7/2015	5/7/2015	5/7/2015	5/18/2015	5/7/2015	5/3/2016	5/27/2015	5/7/2015	5/6/2015	5/3/2016	5/6/2015	5/6/2015	6/4/2015	6/4/2015
SVOCs																		
All SVOCs					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl;
PBDE = Polybrominated Diphenyl Ether; VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound; P = present; A = absent
(1) Drinking Water Standards established by the Washington State Department of Health in 246-290 WAC. Includes Federal MCL Drinking Water Standards.
(2) Groundwater Quality Standard: Established by the Washington State Department of Ecology in WAC 173-200-040.
J = Value is detected and the result is estimated
J- = Value is detected and the result is estimated and biased low
UJ = Result is a non-detect and the value is estimated
R = Result rejected
*Drinking water and groundwater quality standards are for total metals.

Table 4-4. Beatty Springs (on Woodland Creek) water quality data (summarized from HDR, 2016).

Parameter	Units	MRL	Drinking Water Std(1)	Ground-water Quality Std(2)	Beatty Springs 8/27/2015	Beatty Springs 9/14/2015	Beatty Springs 10/12/2015	Beatty Springs 12/7/2015
General Water Quality Parameters								
Bicarbcarbonate Alkalinity (as HCO3)	mg/L	2	N/A	N/A	55	54	56	56
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	45	44	46	46
Carbonate (CO3)	mg/L	2	N/A	N/A	ND	ND	ND	ND
Total Dissolved Solids (TDS)	mg/L	10	500	500	96	100	110	96
Total Suspended Solids (TSS)	mg/L	10	N/A	500	ND	ND	ND	ND
Total Organic Carbon	mg/L	0.3	N/A	N/A	1.1	0.45	0.4	0.36
Bromide	ug/L	5	N/A	N/A	28	26	29	32
Chloride	mg/L	1	1	250	6.4	6.3	5.8	5.9
Fluoride	mg/L	0.05	4	4	ND	ND	ND	ND
Sulfate	mg/L	0.5	0.5	250	8.4	8.4	7.6	7.8
Total Hardness as CaCO3 by ICP	mg/L	3	N/A	N/A	56	57	54	49
Biochemical Oxygen Demand	mg/L	3	N/A	N/A	ND	ND	ND	ND
Anion Sum - Calculated	meq/L	0.001	N/A	N/A	1.5	1.5	1.4	1.4
Cation Sum - Calculated	meq/L	0.001	N/A	N/A	1.5	1.6	1.5	1.4
Hydroxide as OH Calculated	mg/L	2	N/A	N/A	ND	ND	ND	ND
Turbidity	NTU	1	N/A	N/A	0.34	0.32	0.26	0.28
Metals (Dissolved)*								
Arsenic	ug/L	1	10	0.05	ND	ND	ND	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND
Cadmium	ug/L	0.5	5	10	ND	ND	ND	ND
Calcium	mg/L	1	N/A	N/A	14	14	13	13
Chromium	ug/L	1	100	50	ND	ND	ND	ND
Copper	ug/L	2	1300	1000	ND	ND	ND	ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	ND	ND
Lead	ug/L	0.5	15	50	ND	ND	ND	ND
Magnesium	mg/L	0.1	N/A	N/A	5.4	5.4	5.2	5.1
Manganese	ug/L	2	50	50	ND	ND	ND	ND
Mercury	ug/L	0.2	2	2	ND	ND	ND	ND
Nickel	ug/L	5	100	N/A	ND	ND	ND	ND
Potassium	mg/L	1	N/A	N/A	1.3	1.3	1.3	1.3
Selenium	ug/L	5	50	10	ND	ND	ND	ND
Silicon	mg/L	0.2	N/A	N/A	11	12	11	11
Silver	ug/L	0.5	100	N/A	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	8.5	8.8	8.2	8
Zinc	ug/L	20	5000	5000	ND	ND	ND	ND
Metals Total								
Calcium	mg/L	1	N/A	N/A	14	14	13	12
Magnesium	mg/L	0.1	50	50	5.2	5.3	5.2	4.7
Mercury	ug/L	0.2	2	2	ND	ND	ND	ND
Selenium	ug/L	5	50	10	ND	ND	ND	ND
Nutrients								
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	3.3	3.3	2.7	2.5
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	15	15	12	11
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	3.3	3.3	2.7	2.5
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND
Total phosphorus as P	mg/L	0.02	N/A	N/A	ND	0.029	0.052	ND
Orthophosphate as P	mg/L	0.01	N/A	N/A	0.014	0.014	0.021	0.021
Residual Chemicals								
Acesulfame-K	ng/L	20	N/A	N/A	540	630	400	430
Carbamazepine	ng/L	5	N/A	N/A	10	7.1	5.4	5.2
Cyanazine	ng/L	5	N/A	N/A	9.2	ND	ND	ND
Quinoline	ng/L	5	N/A	N/A	ND	ND	20	ND
Sucralose	ng/L	100	N/A	N/A	600	720	ND	510
TCEP	ng/L	10	N/A	N/A	14	ND	ND	ND
Bacteria								
Fecal Coliform Bacteria	CFU/100mL	1	N/A	N/A	ND	1	1	ND
Total Coliform Bacteria	MPN/100mL	1	N/A	N/A	100	93	75	66
Total Coliform Bacteria (P/A)	MPN/100mL	0	N/A	N/A	P	P	P	P

Notes:

MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; "mg/L = milligrams per liter (ppm); ug/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); CFU/100ml = Colony Forming Units) per 100 ml, MPN/100ml = Most Probable Number (colony forming units) per 100 ml; P = present; A = absent

These data were obtained as part of the Task 1.2 Surface Water Characterization effort. Full presentation of the data is found in HDR, 2016.

(1) Drinking Water Standards established by the Washington State Department of Health in 246-290 WAC. Includes Federal MCL Drinking Water Standards.

(2) Groundwater Quality Standard: Established by the Washington State Department of Ecology in WAC 173-200-040.

*Drinking water and groundwater quality standards are for total metals.

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Table 4-5. Groundwater analytical data from the LOTT Hawks Prairie Wetlands and Recharge Ponds in November 2013 (at the time of sampling reclaimed water infiltration had been "off" for about 1 year).

Parameter	Units	MRL	Drinking Water Std	Groundwater Quality Std	MW-1	MW-2	MW-3	MW-6	MW-7	MW-8	MW-8 DUP	MW-10	MW-11
					11/19/13	11/19/13	11/13/13	11/14/2013	11/15/13	11/15/13	11/15/13	11/20/2013	11/14/2013
General Water Quality Parameters													
Bicarbonate Alkalinity (as HCO_3)	mg/L	1	N/A	N/A	97	90	83	85	89	79	74	170	140
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	79	74	68	69	73	65	61	140	110
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	uS/cm	2	700	N/A	250	210	220	190	200	340	350	390	400
Total Dissolved Solids (TDS)	mg/L	10	500	500	160	110	120	110	130	170	200	230	240
Total Organic Carbon	mg/L	0.3	N/A	N/A	0.99	0.33	0.35	ND	0.31	0.72	0.85	1.5	0.56
Bromide	ug/L	0.05	N/A	N/A	36	34	37	30	33	65	65	100	77
Chloride	mg/L	1	250	250	17	8.5	10	6.3	7.0	43	43	23	36
Sulfate	mg/L	0.5	250	250	11	8.0	8.4	6.8	7.4	21	21	14	19
Total Hardness as CaCO3	mg/L	3	N/A	N/A	80	81	79	77	82	99	99	120	180
Anion Sum - Calculated	meq/L	0.001	N/A	N/A	2.4	2.0	1.9	1.8	1.9	3.1	3.0	3.8	3.8
Cation Sum - Calculated	meq/L	2	N/A	N/A	2.6	2.2	2.2	1.9	2.1	3.6	3.7	4.2	4.2
Cation/Anion Difference	%	0.001	N/A	N/A	4.4	5.2	ND	2.6	5.2	7.0	10	5.2	ND
Carbon Dioxide Free (25°C)-Calc.	mg/L	1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	8.8	ND
Metals													
Arsenic	ug/L	1	10	0.05	ND	ND	ND	ND	ND	ND	ND	*2.1*	ND
Boron	mg/L	2	N/A	N/A	0.058	ND	ND	ND	ND	0.15	0.15	ND	0.09
Boron Isotope (δ^{11} B)	‰		N/A	N/A	--	20.4	12.4	--	--	14.7	--	--	28.2
Cadmium	ug/L	5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	0.5	N/A	N/A	19	18	18	16	18	25	25	26	31
Chromium	ug/L	1	100	50	ND	ND	ND	ND	ND	1.7	1.2	ND	2.6
Copper	ug/L	2	1300	1000	ND	ND	ND	ND	ND	3.9	3.5	ND	3.2
Fluoride	mg/L	0.05	4	4	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	ND	ND	ND	0.1	0.033	0.24	0.023
Lead	ug/L	0.5	15	50	ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	mg/L	0.1	N/A	N/A	7.8	8.8	8.3	8.9	9	8.9	9.0	13	25
Manganese	ug/L	2	50	50	ND	ND	ND	ND	ND	8.2	4.4	780	5.2
Mercury	ug/L	0.2	2	2	ND	ND	ND	ND	ND	ND	--	ND	ND
Nickel	ug/L	5	100	N/A	ND	ND	ND	ND	ND	12	11	5.4	66
Potassium	mg/L	1	N/A	N/A	2	1.6	1.7	1.6	1.7	2.6	2.7	2.8	3.6
Selenium	ug/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.5	N/A	N/A	26	28	27	27	29	34	22	34	46
Silver	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	21	12	14	6.8	10	37	38	42	10
Zinc	ug/L	20	5000	5000	ND	ND	ND	ND	ND	ND	ND	ND	ND

Parameter	Units	MRL	Drinking Water Std	Groundwater Quality Std	MW-1	MW-2	MW-3	MW-6	MW-7	MW-8	MW-8 DUP	MW-10	MW-11
					11/19/13	11/19/13	11/13/13	11/14/2013	11/15/13	11/15/13	11/15/13	11/20/2013	11/14/2013
Nutrients													
Total Nitrate, Nitrite-N, CALC	mg/L	0.1	N/A	N/A	0.86	0.96	1.0	1.1	1.0	2.0	2.0	0.27	1.6
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	3.8	4.2	4.6	4.9	4.6	8.8	8.8	1.2	7.2
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	0.86	0.96	1.0	1.1	1.0	2.0	2.0	0.27	1.6
Nitrite Nitrogen by IC	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	0.092	0.093	0.065	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	0.26	ND	ND
Total phosphorus	mg/L	0.02	N/A	N/A	ND	ND	ND	ND	0.04	0.4	0.37	0.2	ND
Orthophosphate	mg/L	0.01	N/A	N/A	ND	0.011	ND	0.011	0.017	0.34	0.47	0.025	0.013
Residual Chemicals													
1,4-Dioxane	ug/L	0.07	N/A	N/A	--	0.116	ND	--	--	0.324	--	--	0.396
Acesulfame-K	ng/L	20	N/A	N/A	6000	1100	2000	1100	820	14000	16000	5600	23000
Albuterol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	16	26	ND	31
BPA[A (14)]	ng/L	10	N/A	N/A	--	ND	ND	--	--	53	--	--	ND
BPA[B (14)]	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	31	22	ND	ND
Carbamazepine	ng/L	5	N/A	N/A	54	20	22	ND	8.5	78	59	ND	ND
DACT	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	6.0	8.2	ND	ND
Dehydronifedipine	ng/L	5	N/A	N/A	5.6	ND	ND	ND	ND	22	21	ND	ND
Nonylphenol Monoethoxylate	ng/L	100	N/A	N/A	--	ND	ND	--	--	ND	--	--	130
Primidone	ng/L	5	N/A	N/A	11	ND	ND	ND	ND	12	10	28	52
Sucralose	ng/L	100	N/A	N/A	3000	400	1400	960	270	2400	2300	1000	10000
Sulfamethoxazole	ng/L	5	N/A	N/A	48	ND	35	ND	ND	110	97	ND	64
TCEP	ng/L	10	N/A	N/A	13	ND	ND	ND	ND	24	36	ND	ND
TDCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	960	ND
Bacteria													
Fecal Coliform	cfu/100 ml	1	N/A	N/A	ND	ND	--	ND	ND	ND	ND	ND	ND
Total Coliform Bacteria	cfu/100 ml	0.5	N/A	N/A	ND	ND	--	--	--	--	--	ND	--
Total Coliform Bacteria (P/A)	/100 ml	1	N/A	N/A	--	--	ND	--	--	--	--	--	--
VOCs													
Chloroform (Trichloromethane)	ug/L	0.5	N/A	7	ND	ND	ND	ND	ND	0.74	0.68	ND	2.2
Total THM	ug/L	0.5	80	N/A	ND	ND	ND	ND	ND	0.74	0.68	ND	2.2

Notes:

MRL = Minimum Reporting Level; -- The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; CFU/100ml = Colony Forming Units) per 100 ml; VOC = Volatile Organic Compound

(1) Drinking Water Standards established by the Washington State Department of Health in 246-290 WAC. Includes Federal MCL Drinking Water Standards.

(2) Groundwater Quality Standard: Established by the Washington State Department of Ecology in WAC 173-200-040.

BPA (Bisphenol A) was analyzed by two methods. BPAA reports results from EPA Method 539 Modified (Low Detection Level Hormones). BPAB reports results from EEA Method LC/MS/MS (Endocrine Disruptors Negative Mode).

Table 4-6. Groundwater analytical results from Tumwater Study Area residential wells (see Appendix E for full results).

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
General Water Quality Parameters																									
pH	Units	0.1	N/A	N/A	7.5 J	7.5 J	7.7 J	7.6 J	7.2 J	7 J	7.8 J	7.4 J	6.6 J	7.6 J	6.9 J	7.2 J	7 J	6.9 J	7.2 J	7.4 J	7.1 J	6.8 J	7.7 J	6.8 J	6.4 J
Bicarbcarbonate Alkalinity (as HCO_3)	mg/L	2	N/A	N/A	64	64	47	66	78	78	69	40	25	77	43	37	36	35	48	52	58	48	100	91	84
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	53	52	38	54	64	64	57	33	21	63	35	30	30	29	40	42	48	39	86	74	68
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	umho/cm	2	700	N/A	150	130	86	160	210	200	160	120	74	130	120	92	90	130	130	120	140	140	200	190	250
Total Dissolved Solid (TDS)	mg/L	10	500	500	110	110	170	130	150	170	110	88	64	130	100	71	77	100	100	94	100	110	140	130	160
Total Organic Carbon	mg/L	0.3	N/A	N/A	0.3	0.3	ND	ND	ND	ND	0.49 J+	ND	ND	ND	ND	ND	ND	0.54	ND	0.31	0.47 J+	0.57 J+	ND	0.84	0.58
Bromide	ug/L	5	N/A	N/A	7.4	15	8.6	16	17	18	12	14	5.4	5.8	9.1	8.6	ND	51	52	7.3	100	14	18	78	67
Chloride	mg/L	1	250	250	2.7	2.8	1.8	4.5	3.6	3.5	6.4	5.1	3.7	2.2	5.2	3.2	2.2	7.3	7.2	2.4	5.9	5.3	4	2.8	5.3
Sulfate	mg/L	0.5	250	250	9.2	6.1	1.9	5.1	6	6	13	4.7	3.8	4.5	5.1	3.7	4.2	4.4	2.9	9	4.1	5.1	6.7	11	30
SulfideTotal	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	59	52	29	64	86	89	63	44	25	52	42	32	33	44	52	43	53	48	84	83	100
Anion Sum - Calculated	meq/L	0.001	N/A	N/A	1.4	1.3	0.86	1.5	2	1.9	1.6	1.1	0.69	1.4	1.1	0.87	0.86	1.2	1.2	1.1	1.3	1.3	2	1.9	2.4
Cation Sum - Calculated	meq/L	0.001	N/A	N/A	1.5	1.4	0.91	1.6	2.1	2.1	1.6	1.1	0.69	1.4	1.2	0.87	0.87	1.2	1.3	1.2	1.4	1.3	2.1	2	2.5
Metals (Dissolved)																									
Aluminum	ug/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	ug/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND
Arsenic	ug/L	1	10	0.05	ND	1.4	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	1.7	ND	ND
Barium	ug/L	2	2000	1000	4.1	3	5.1	4.1	7.3	7.3	11	2.4	ND	2.4	2.5	ND	2.1	2.8	2.9	3.3	2.3	3.6	8	4	6
Beryllium	ug/L	1	4	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.5 UJ	ND	ND
Calcium	mg/L	1	N/A	N/A	13	10	5.9	15	19	20	10	12	7	11	11	8.4	8.5	12	13	9.5	13	12	14	22	26
Chromium	ug/L	1	100	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/L	2	1300	1000	4.8	ND	ND	180	ND	ND	ND	ND	27	ND	35	ND	130	110	3.7	2.1	2.8	6.3	ND	3.1	10
Iron	mg/L	0.02	0.3	0.3	ND	ND	0.31	ND	ND	ND	0.91	ND	ND	0.93	ND	0.1	ND	ND	ND	ND	ND	ND	0.19	0.027	0.021
Lead	ug/L	0.5	15	50	ND	ND	ND	ND	ND	ND	ND	ND	0.84	ND	0.83	ND	0.64	0.65	ND	ND	ND	ND	ND	0.84	ND
Magnesium	mg/L	0.1	N/A	N/A	6.4	6.7	3.5	6.4	9.4	9.6	9.2	3.3	1.8	5.9	3.6	2.8	2.8	3.4	4.7	4.6	5	4.5	12	6.8	8.4
Manganese	ug/L	2	50	50	ND	ND	110	ND	ND	ND	280	ND	ND	160	ND	ND	ND	ND	ND	18	8.4	ND	330	ND	6.6

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Mercury	ug/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/L	1	N/A	N/A	2.1	2.1	2	1.5	1.8	1.8	2.4	ND	ND	2.1	1.1	ND	ND	ND	ND	2.1	1.1	1.4	3.1	ND	ND
Selenium	ug/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.428	N/A	N/A	37	39	43	34	38	38	28	27	26	58	32	27	31	25	30	37	31	29	37	26	29
Silver	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	6.6	6.7	6.3	6.6	6.9	7.1	6.4	4.9	4.4	6.6	6.6	5.1	4.9	7	5.7	6.9	6.3	6.9	7.5	8.1	12
Thallium	ug/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/L	20	5000	5000	27	ND	ND	ND	ND	ND	ND	ND	ND	50	79	21	160	ND	71	28	35	ND	39	48	ND
Nutrients																									
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	1.9	0.8	ND	2.8	6.5	6.2	ND	2.3	1.3	ND	2.5	1.4	1.6	4.6	2.5	0.35	1.8	3.1	ND	1.2	4.1
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	8.3	3.5	ND	12	29	27	ND	10	5.8	ND	11	6.1	7	20	11	1.6	7.9	14	ND	5.1	18
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	1.9	0.8	ND	2.8	6.5	6.2	ND	2.3	1.3	ND	2.5	1.4	1.6	4.6	2.5	0.35	1.8	3.1	ND	1.2	4.1
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	ND	0.093	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.2 UJ	ND	0.22	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.026	0.044	0.16	ND	0.074	0.043	ND	ND	0.061	0.13	ND	ND	0.027	ND	ND	0.13	ND	ND	0.021	ND	0.049
Orthophosphate as P	mg/L	0.01	N/A	N/A	0.026	0.051	0.1	0.017	0.019	0.016	0.022	0.014	0.02	0.073	0.013	0.017	0.012	0.011	0.015	0.12	ND	0.024	0.055	0.011	0.012
Residual Chemicals																									
4-nonylphenol - semi quantitative	ng/L	100	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	100 J	ND UJ	ND UJ	ND UJ
Acesulfame-K	ng/L	20	N/A	N/A	460	ND	ND	840	ND	ND	ND	ND	20	ND	240	40	ND	460	40	ND	57	1500	ND	220	830
Caffeine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbamazepine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	66	ND	ND	ND
Chloridazon	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.1	7.6	7.5	ND	ND	ND
Fluoxetine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metformin	ng/L	10	N/A	N/A	ND	180	230	ND	ND	160	ND	ND	ND	210	ND	ND	ND	ND	ND	ND	ND	ND	ND	410	840
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	6.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sucralose	ng/L	100	N/A	N/A	240	ND	ND	590	ND	ND	ND	ND	ND	ND	350	ND	ND	470	180	ND	130	1200	ND	620	1500
TCEP	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PFCs																									
All PFCs	ng/L	5-10	N/A	N/A	ND	ND	ND	ND	ND	ND	< 10	ND	ND	< 10	ND	ND	ND	ND	ND	ND	< 10	ND	ND	< 10	ND
DBPs																									
All DPBs	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Bacteria																									
E. Coli Bacteria (P/A)	P/A	0	A	N/A	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J
E. Coli Bacteria	MPN/100 mL	1	1	N/A	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J
Fecal Coliform Bacteria (P/A)	P/A	0	A	N/A	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	P J	A J	A J	A J	A J	A J
Fecal Coliform	MPN/100 mL	1	1	N/A	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	1 J	<1 J	<1 J	<1 J	<1 J	<1 J
Total Coliform Bacteria (P/A)	P/A	0	A	N/A	A J	A J	P J	A J	A J	P J	A J	P J	A J	P J	P J	A J	A J	A J	A J	A J	A J	P J	P J	A J	A J
Total Coliform Bacteria	MPN/100 mL	1	1	N/A	<1 J	<1 J	1 J	<1 J	<1 J	1 J	<1 J	4.1 J	<1 J	82 J	1400 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	6.2 J	11 J	<1 J	<1 J
PCBs																									
All PCBs	ug/L	.08-.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides and Herbicides																									
All Pesticides and Herbicides	ug/L	0.01-2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VOCs																									
All VOCs	ug/L	0.3-10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs																									
Di(2-Ethylhexyl)phthalate	ug/L	0.6	6	N/A	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl; PBDE = Polybrominated Diphenyl Ether; VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound; P = present; A = absent

(1) Established by the Washington State Department of Health in 246-290 WAC. Bacteria drinking water standards are listed in WAC 246-290-310(2)

(2) Established by the Washington State Department of Ecology in WAC 173-200-040

J = Value is detected and the result is estimated

J- = Value is detected and the result is estimated and biased low

UJ = Result is a non-detect and the value is estimated

R = Result rejected

*Drinking water and groundwater quality standards are for total metals.

Table 4-7. Groundwater analytical results for Tumwater Study Area public supply wells (see Appendix E for full results).

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwater Well #11	Tumwater #12	Tumwater Well #4	Tumwater Well #9	Tumwater Well #10	Tumwater Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
General Water Quality Parameters														
pH	Units	0.1	N/A	N/A	7.6 J	7.3 J	7.4 J	7.1 J	7.3 J	7.2 J	7.7 J	7.2 J	7.7 J	7.1 J
Bicarbcarbonate Alkalinity (as HCO_3)	mg/L	2	N/A	N/A	97	53	64	65	81	110	62	66	57	70
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	80	44	52	54	66	90	51	54	47	58
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	umho/cm	2	700	N/A	180	120	140	130	160	200	140	140	140	200
Total Dissolved Solid (TDS)	mg/L	10	500	500	130	110	120	100	120	140	110	110	120	150
Total Organic Carbon	mg/L	0.3	N/A	N/A	ND	ND	0.34	ND	ND	0.3	ND	0.31	ND	0.3
Bromide	ug/L	5	N/A	N/A	21	14	24	12	16	27	11	22	14	15
Chloride	mg/L	1	250	250	3.9	4.1	4	3.2	3.4	3.7	3.3	3.3	3.4	5.9
Sulfate	mg/L	0.5	250	250	3.4	4.2	5.9	4	4.1	4.3	3.4	4.5	4.7	9.5
SulfideTotal	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	78	44	54	55	70	89	56	57	57	78
Anion Sum - Calculated	meq/L	0.001	N/A	N/A	1.8	1.2	1.4	1.3	1.6	2	1.4	1.4	1.4	1.9
Cation Sum - Calculated	meq/L	0.001	N/A	N/A	2	1.2	1.4	1.4	1.7	2.2	1.4	1.4	1.5	1.9
Metals (Dissolved)														
Aluminum	ug/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	ug/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/L	1	10	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ug/L	2	2000	1000	2.6	2.6	4.5	3.3	4.6	4.8	2.2	3.6	2.5	5.1
Beryllium	ug/L	1	4	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	N/A	N/A	16	10	12	13	15	19	12	12	12	16
Chromium	ug/L	1	100	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/L	2	1300	1000	ND	ND	ND	4.2	10	4.9	ND	ND	ND	ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	ND	ND	ND	ND	ND	0.049	ND	ND
Lead	ug/L	0.5	15	50	ND	ND	ND	ND	2	ND	ND	ND	ND	ND
Magnesium	mg/L	0.1	N/A	N/A	9.2	4.7	5.9	5.4	7.8	10	6.4	6.6	6.6	9.3
Manganese	ug/L	2	50	50	ND	ND	7.1	ND	ND	ND	ND	3.6	ND	ND
Mercury	ug/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/L	1	N/A	N/A	2.1	1.2	1.5	1.4	2.2	2.7	1.4	1.5	1.6	1.9

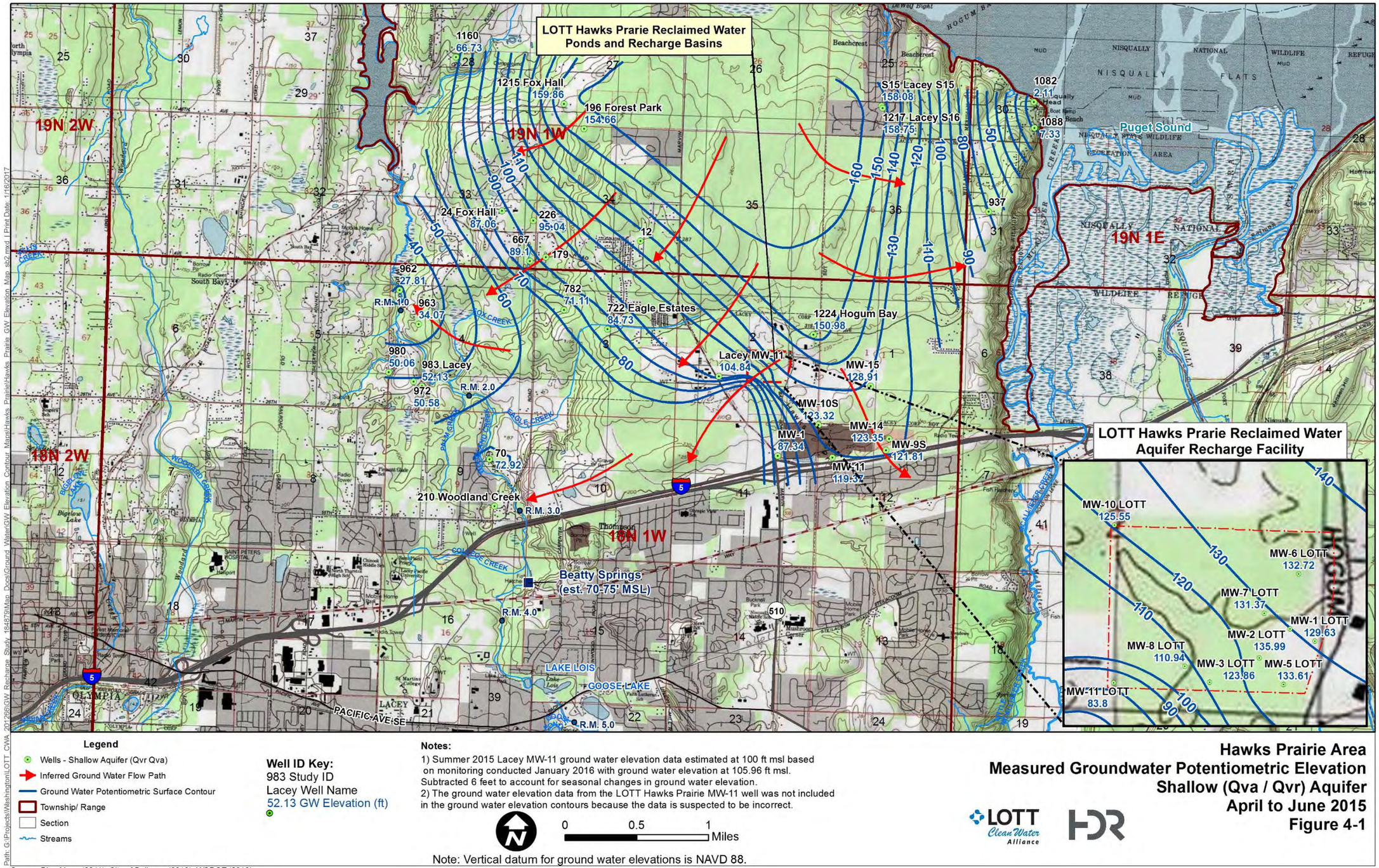
Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwater Well #11	Tumwater #12	Tumwater Well #4	Tumwater Well #9	Tumwater Well #10	Tumwater Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Selenium	ug/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.428	N/A	N/A	38	33	33	35	36	42	30	38	33	40
Silver	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	7.6	5.6	6.3	5.5	6.2	7.4	6.1	5.9	6.1	7.4
Thallium	ug/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/L	20	5000	5000	ND	ND	43	ND	ND	ND	24	ND	ND	ND
Nutrients														
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	0.81	1.1	1.3	0.9	1.1	0.68	2.6	1.3	3.4	4.8
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	3.6	5	5.8	4	5	3	11	5.9	15	22
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	0.81	1.1	1.3	0.9	1.1	0.68	2.6	1.3	3.4	4.8
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.1	0.038	0.053	0.041	0.042	0.059	0.07	0.05	0.038	0.037
Orthophosphate as P	mg/L	0.01	N/A	N/A	0.068	0.022	0.03	0.014	0.017	0.028	0.038	0.019	0.023	0.02
Residual Chemicals														
4-nonylphenol - semi quantitative	ng/L	100	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Acesulfame-K	ng/L	20	N/A	N/A	ND	33	ND	ND	28	ND	ND	ND	21	190
Caffeine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbamazepine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloridazon	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	7.5	ND	ND
Cyanazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	12	ND	ND
Fluoxetine	ng/L	10	N/A	N/A	ND	ND	ND	ND	12	ND	ND	ND	ND	ND
Metformin	ng/L	10	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sucralose	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCEP	ng/L	10	N/A	N/A	ND	ND	50	ND	ND	ND	ND	ND	ND	ND
PFCs														
All PFCs	ng/L	5-10	N/A	N/A	--	--	--	--	--	--	--	--	--	--
DBPs														
All DPBs	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Bacteria														
E. Coli Bacteria (P/A)	P/A	0	A	N/A	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ
E. Coli Bacteria	MPN/100 mL	1	1	N/A	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ
Fecal Coliform Bacteria (P/A)	P/A	0	A	N/A	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ
Fecal Coliform	MPN/100 mL	1	1	N/A	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ

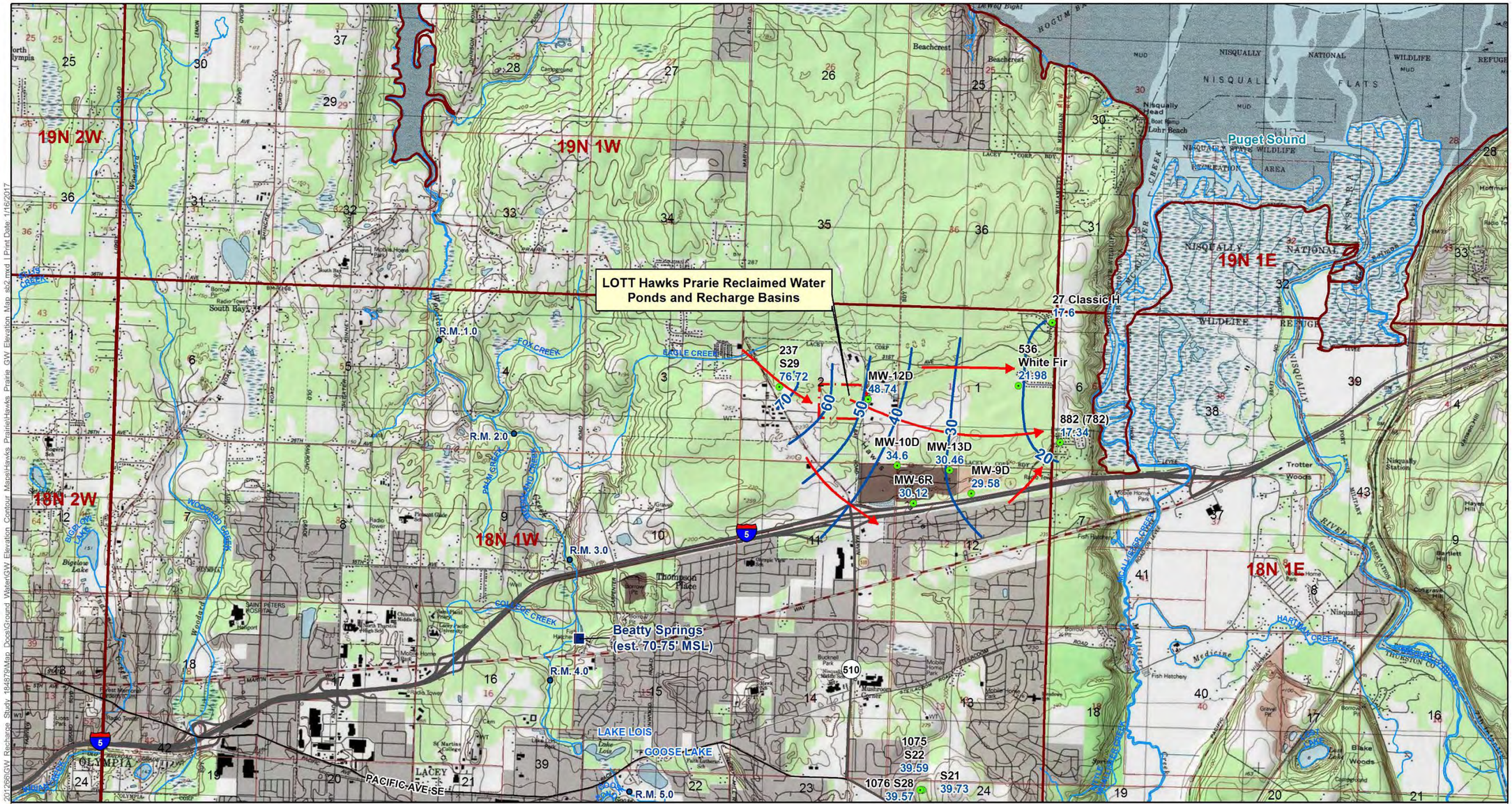
Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwater Well #11	Tumwater #12	Tumwater Well #4	Tumwater Well #9	Tumwater Well #10	Tumwater Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Total Coliform Bacteria (P/A)	P/A	0	A	N/A	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	P J
Total Coliform Bacteria	MPN/100 mL	1	1	N/A	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	9.7 J
PCBs														
All PCBs	ug/L	.08-.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Pesticides and Herbicides														
All Pesticides and Herbicides	ug/L	0.01-2	N/A	N/A	--	--	--	--	--	--	--	--	--	--
VOCs														
All VOCs	ug/L	0.3-10	N/A	N/A	--	--	--	--	--	--	--	--	--	--
SVOCs														
Di(2-Ethylhexyl)phthalate	ug/L	0.6	6	N/A	--	--	--	--	--	--	--	--	--	--

Notes:
MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl; PBDE = Polybrominated Diphenyl Ether; VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound; P = presence, A = absence.
(1) Established by the Washington State Department of Health in 246-290 WAC. Bacteria drinking water standards are listed in WAC 246-290-310(2)

(2) Established by the Washington State Department of Ecology in WAC 173-200-040

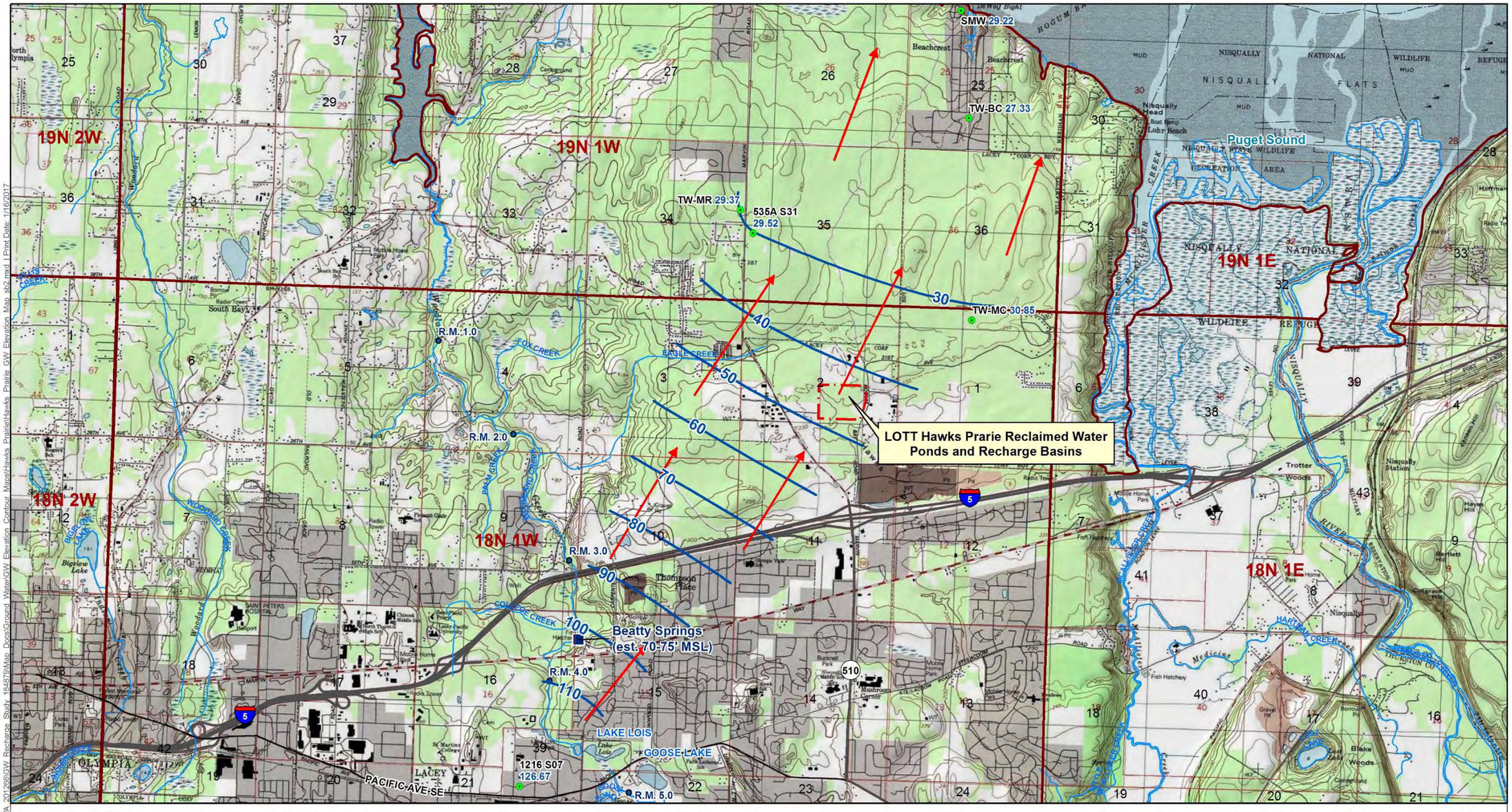
J = Value is detected and the result is estimated
J- = Value is detected and the result is estimated and biased low
UJ = Result is a non-detect and the value is estimated
R = Result rejected
*Drinking water and groundwater quality standards are for total metals.


LOTT Hawks Prarie Reclaimed Water
Ponds and Recharge Basins
LOTT Hawks Prarie Reclaimed Water
Aquifer Recharge Facility
19N 2W
19N 1W
19N 1E
18N 2W
18N 1W
1160
66.73
1215 Fox Hall
159.86
196 Forest Park
154.66
24 Fox Hall
87.06
226
95.04
667
89.1
179
962
27.81
R.M. 1.0
963
34.07
782
71.11
722 Eagle Estates
84.73
980
50.06
983 Lacey
52.13
972
50.58
R.M. 2.0
70
72.92
210 Woodland Creek
R.M. 3.0
Beatty Springs
(est. 70-75' MSL)
R.M. 4.0
R.M. 5.0
1224 Hogum Bay
150.98
Lacey MW-11
104.84
MW-15
128.91
MW-10S
123.32
MW-14
123.35
MW-1
87.34
MW-9S
121.81
MW-11
119.37
S15 Lacey S15
158.08
1217 Lacey S16
158.75
1082
2.11
1088
7.33
937
Puget Sound
NISQUALLY NATIONAL WILDLIFE REFUGE
NISQUALLY STATE WILDLIFE RECREATION AREA
NISQUALLY FLATS
MW-10 LOTT
125.55
MW-6 LOTT
132.72
MW-7 LOTT
131.37
MW-1 LOTT
129.63
MW-2 LOTT
135.99
MW-8 LOTT
110.94
MW-3 LOTT
123.86
MW-5 LOTT
133.61
MW-11 LOTT
83.8
OLYMPIA
LACEY
LAKE LOIS
GOOSE LAKE
PACIFIC AVE SE
Legend
Wells - Shallow Aquifer (Qvr Qva)
Inferred Ground Water Flow Path
Ground Water Potentiometric Surface Contour
Township/ Range
Section
Streams
Well ID Key:
983 Study ID
Lacey Well Name
52.13 GW Elevation (ft)
Notes:
1) Summer 2015 Lacey MW-11 ground water elevation data estimated at 100 ft msl based on monitoring conducted January 2016 with ground water elevation at 105.96 ft msl. Subtracted 6 feet to account for seasonal changes in ground water elevation.
2) The ground water elevation data from the LOTT Hawks Prairie MW-11 well was not included in the ground water elevation contours because the data is suspected to be incorrect.
0
0.5
1
Miles
Note: Vertical datum for ground water elevations is NAVD 88.
Hawks Prairie Area
Measured Groundwater Potentiometric Elevation
Shallow (Qva / Qvr) Aquifer
April to June 2015
Figure 4-1
LOTT Clean Water Alliance
HDR
Path: G:\Projects\Washington\LOTT_CWA_2012969\GW_Recharge_Study_184879\Map_Docs\Ground_Water\GW_Elevation_Contour_Maps\Hawks_Prairie_GW_Elevation_Map_sb2.mxd | Print Date: 1/16/2017
Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).



Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).

Path: G:\Projects\Washington\LOTT_CWA_2012\6\GW_Recharge_Study_184879\Map_Docs\Ground_Water\GW_Elevation_Contour_MaselHawks_PrairieHawks_Prairie_GW_Elevation_Map_eb2.mxd | Print Date: 1/16/2017



Hawks Prairie Area
Measured Groundwater Potentiometric Elevation
Deep (TQu) Aquifer
April to June 2015
Figure 4-3

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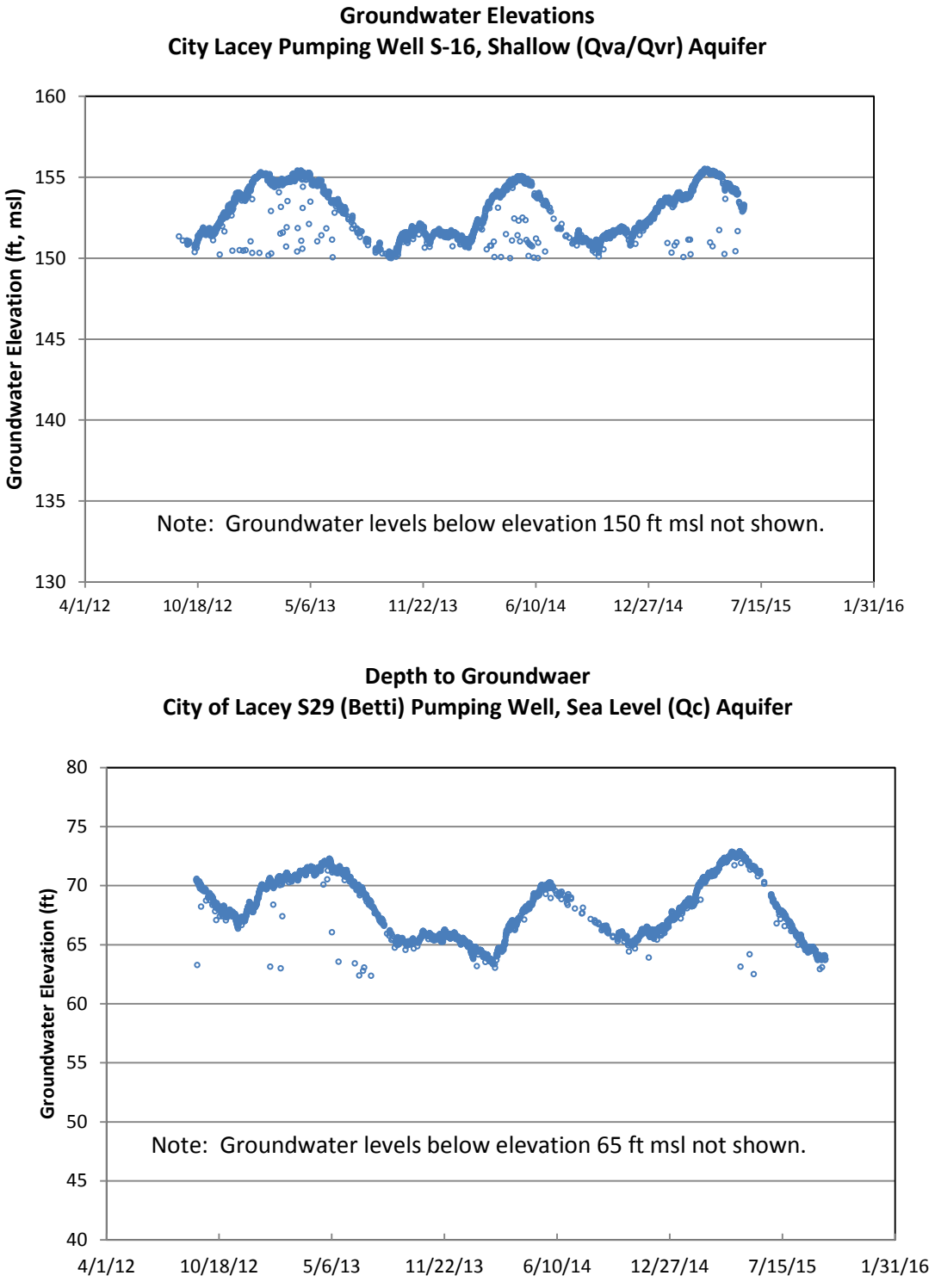


Figure 4-4. Seasonal groundwater levels in City of Lacey Upper (Qvr/Qva) Aquifer (top) and Sea Level (Qc) Aquifer (bottom) during pumping and non-pumping periods.

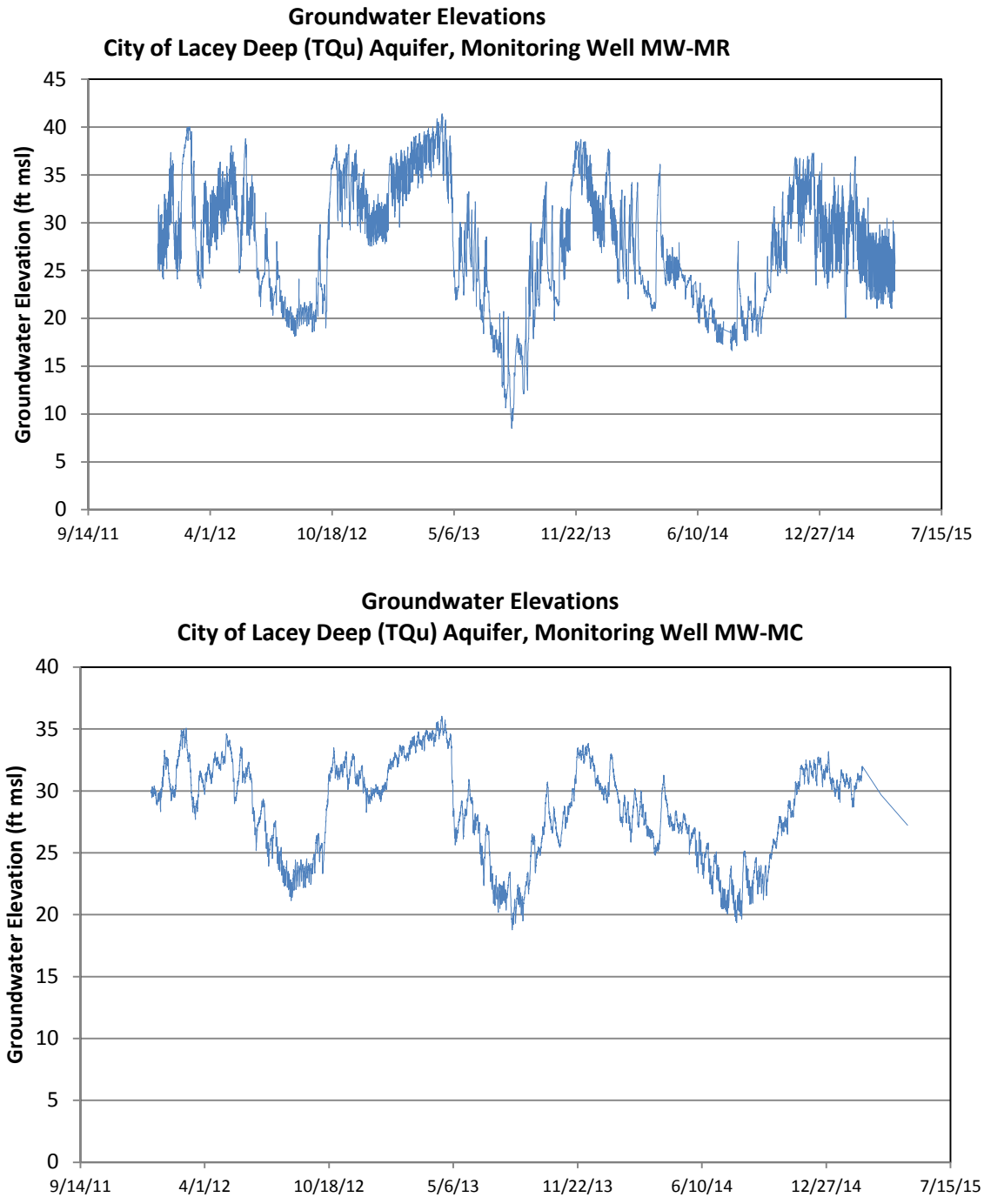
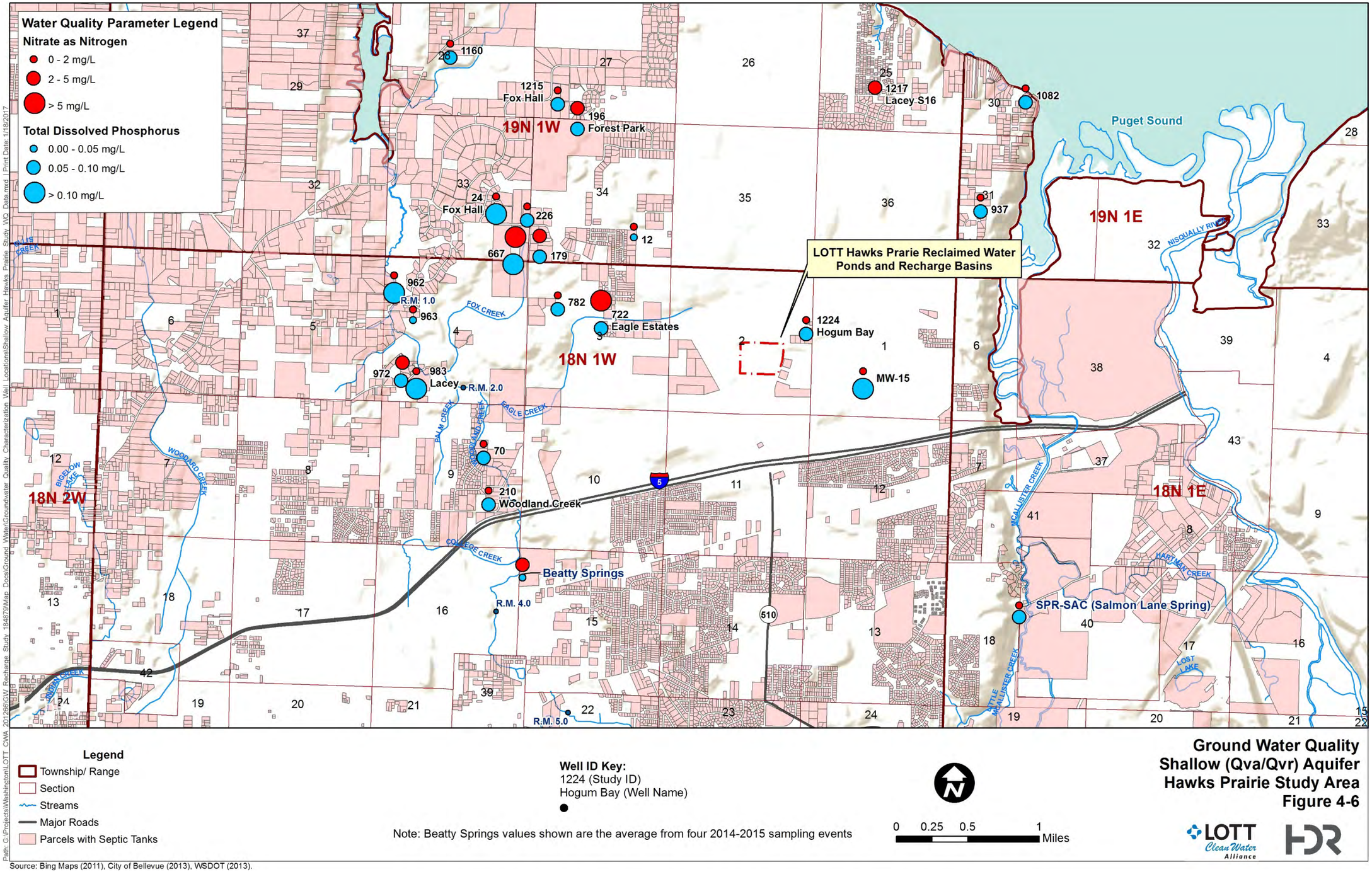
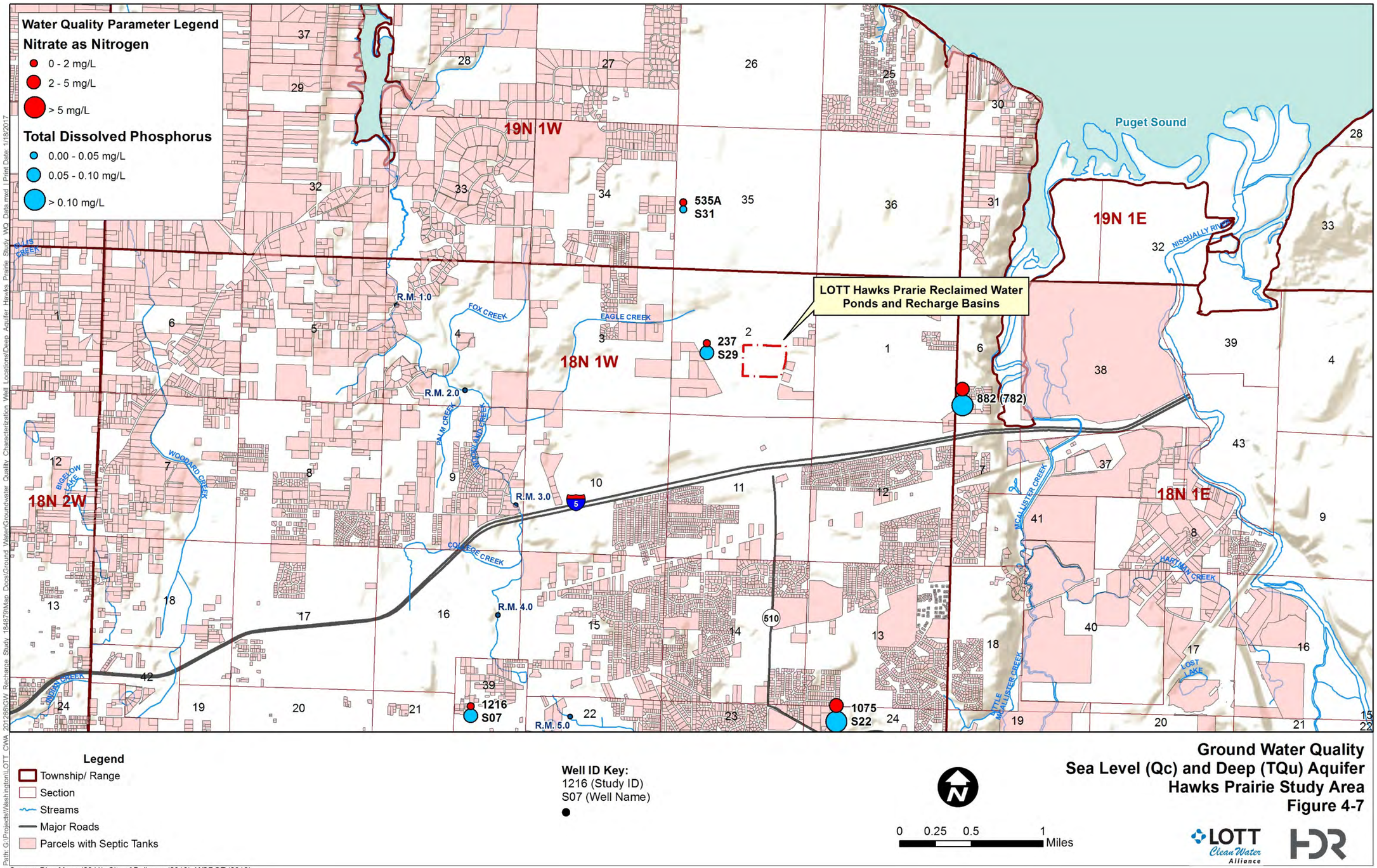


Figure 4-5. Seasonal groundwater levels in City of Lacey Deep (TQu) Aquifer monitoring wells MW-MC and MW-MR (note the effects of Puget Sound tidal changes on groundwater levels).



Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).



Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).

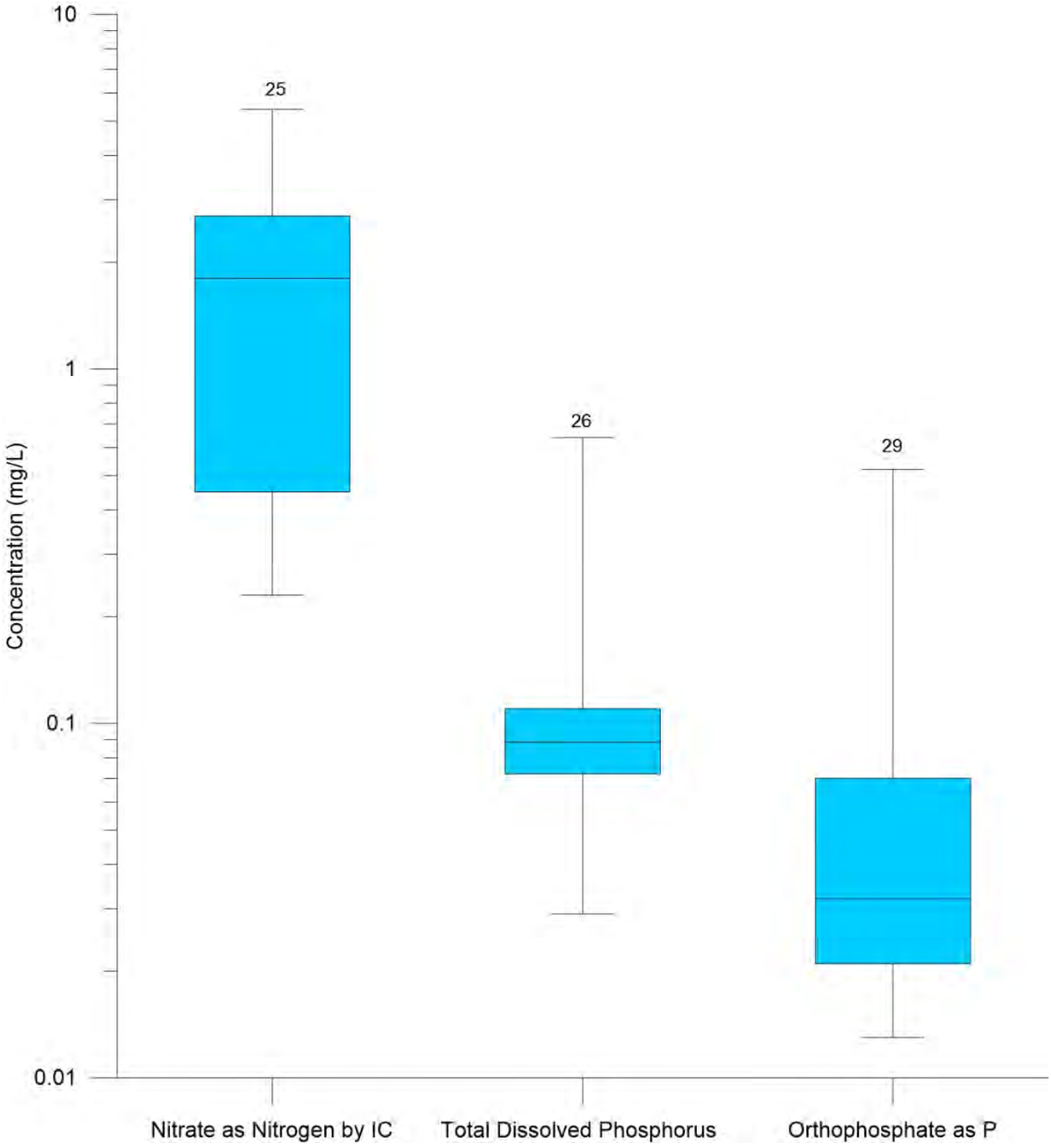


Figure 4-8. Nitrate and phosphorus from residential wells and public supply wells in the Hawks Prairie Study Area (# samples with detections above MRL, max., 75%, 50%, 25% percentile and min. values).

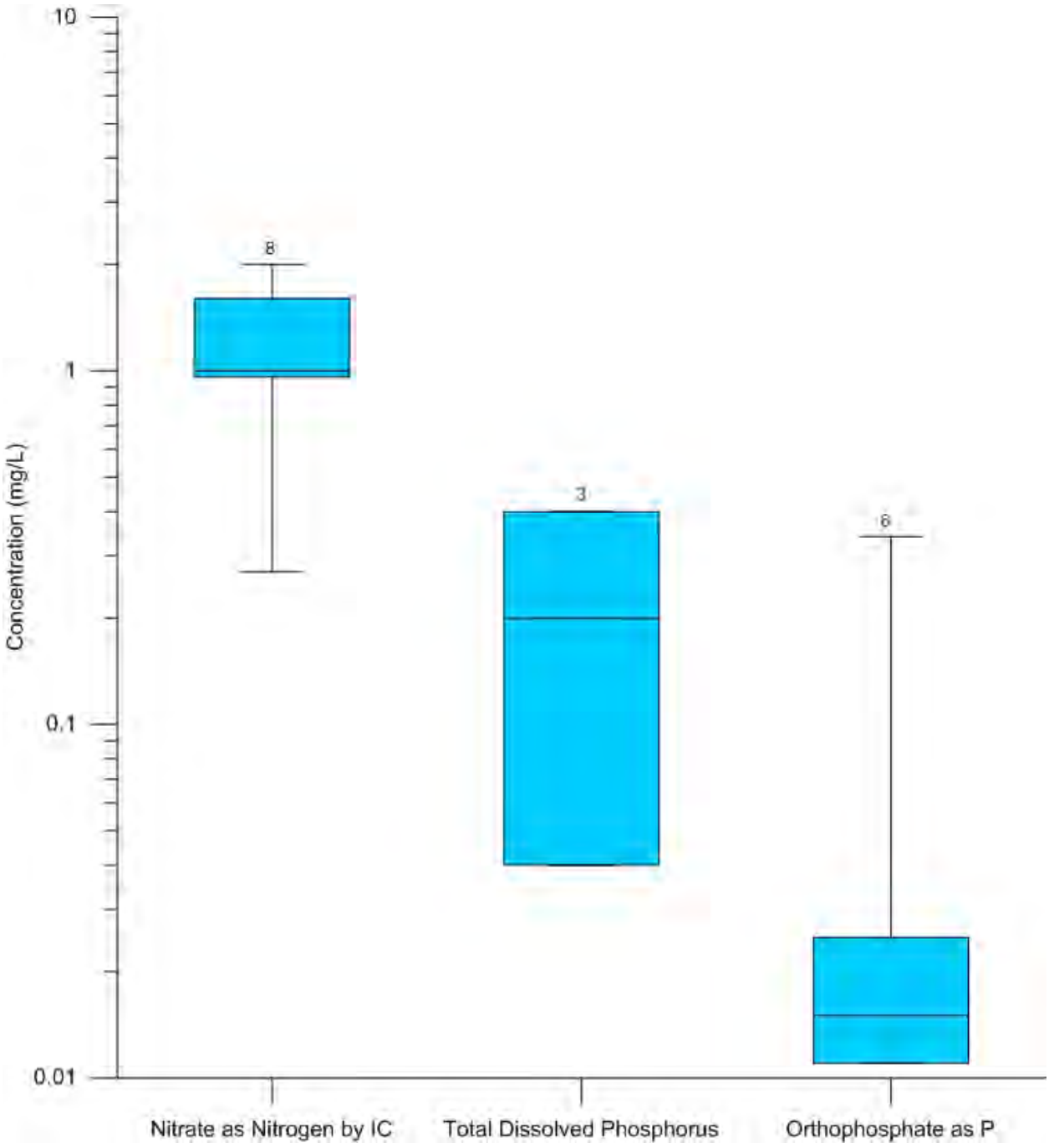


Figure 4-9. Nitrate and phosphorus from monitoring wells at the LOTT Hawks Prairie Reclaimed Water Ponds and Recharge Basins property sampled in 2013 (# samples with detections above MRL, max., 75%, 50%, 25% percentile and min. values).

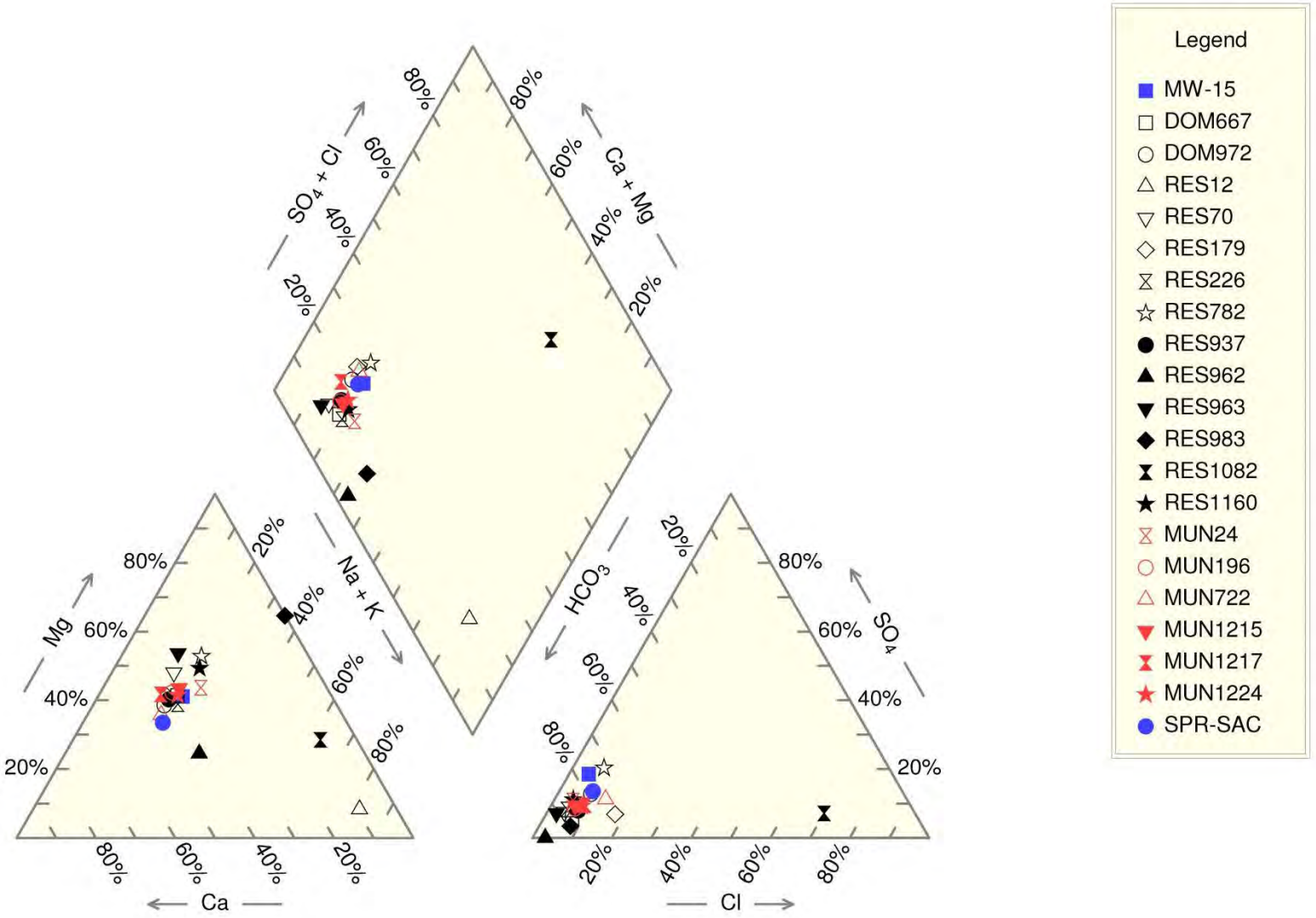


Figure 4-10. Piper diagram showing major ion geochemistry of groundwater samples from residential or public supply wells completed in the Hawks Prairie Study Area Shallow (Qva/Qvr) Aquifer.

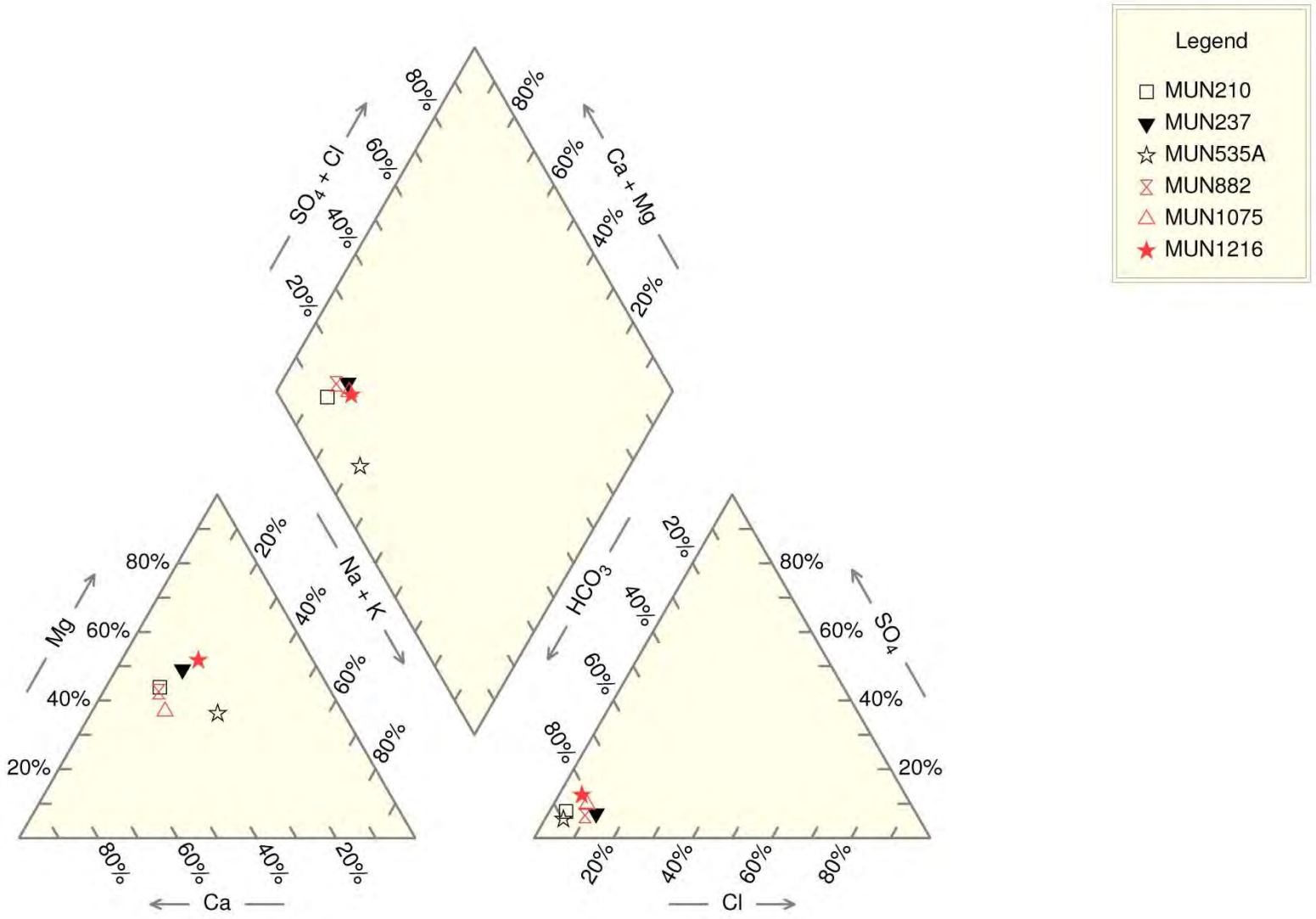


Figure 4-11. Piper diagram showing major ion geochemistry of groundwater samples from public supply wells completed in the Hawks Prairie Study Area deeper aquifers (Sea (Qc) Level Aquifer or the Deep (TQu) Aquifer).

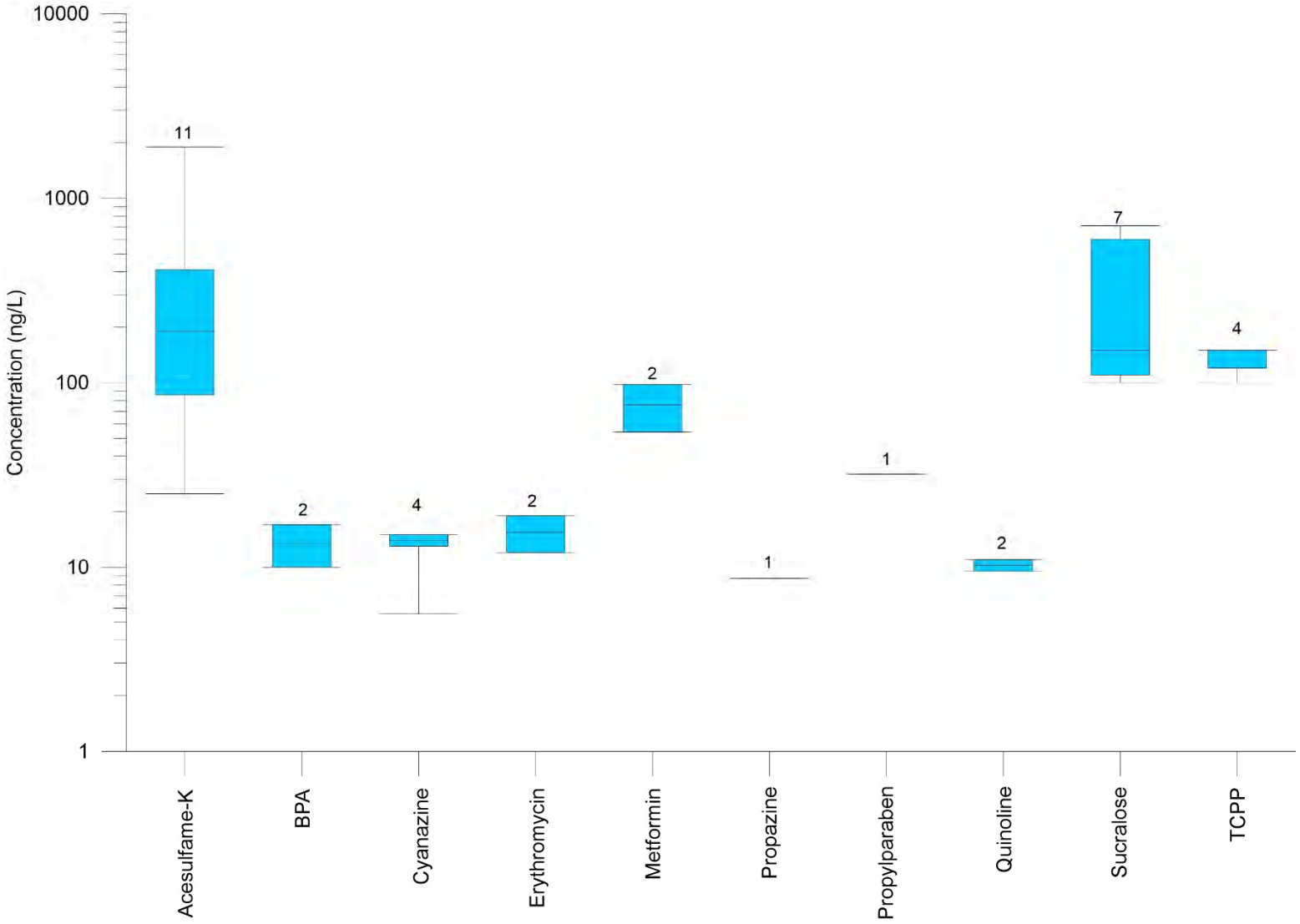


Figure 4-12. Residual chemicals detected in Hawks Prairie Study Area residential wells, public supply wells and Salmon Lane Spring (# samples with detections above MRL, max., 75%, 50%, 25% percentile and min. values).

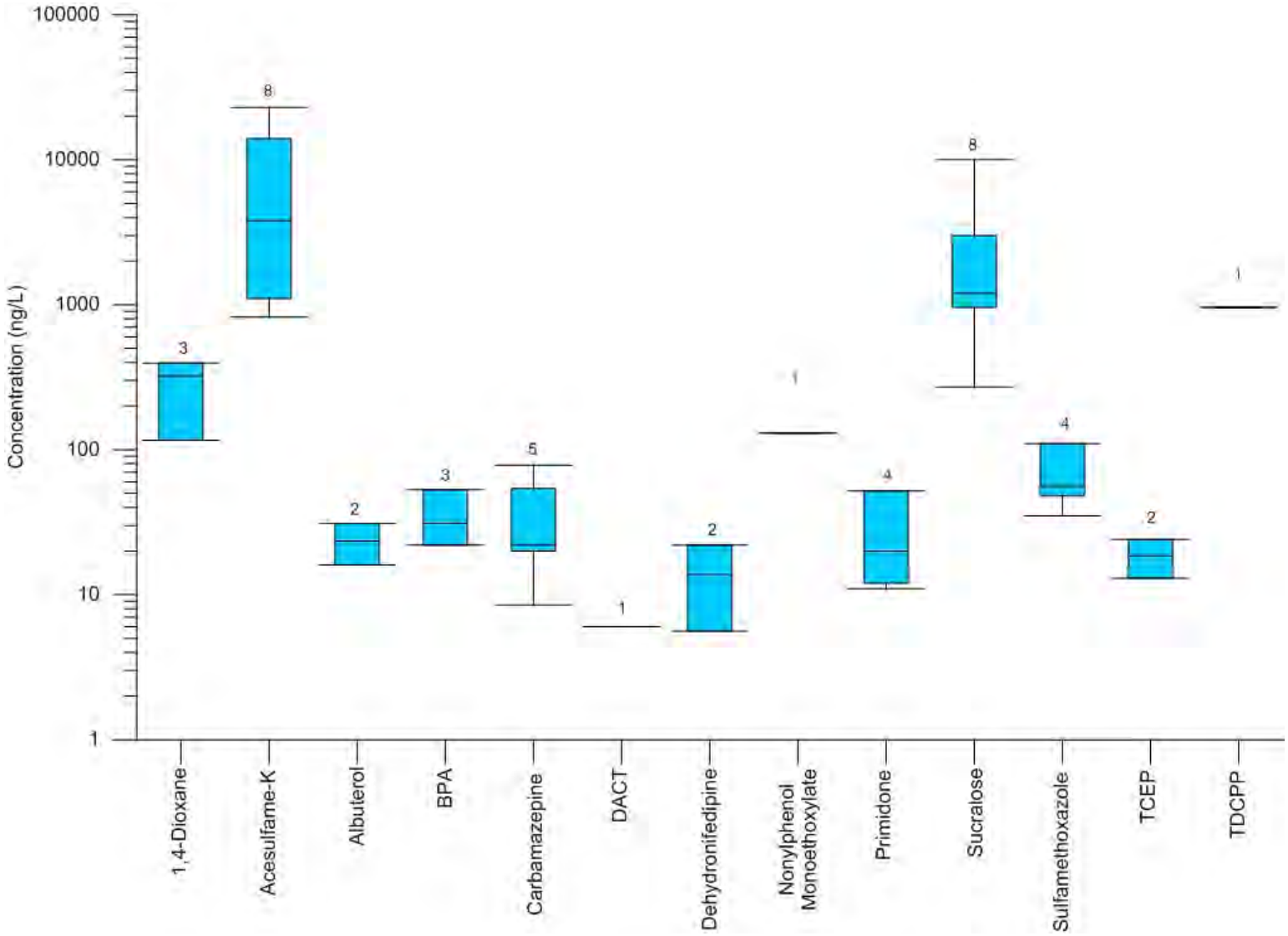


Figure 4-13. Residual chemicals detected in the LOTT Hawks Prairie Reclaimed Water Ponds and Recharge Basins property monitoring wells during Nov. 2013 prior to re-starting reclaimed water infiltration on the site (# samples with detections above MRL, max., 75%, 50%, 25% percentile and min. values).

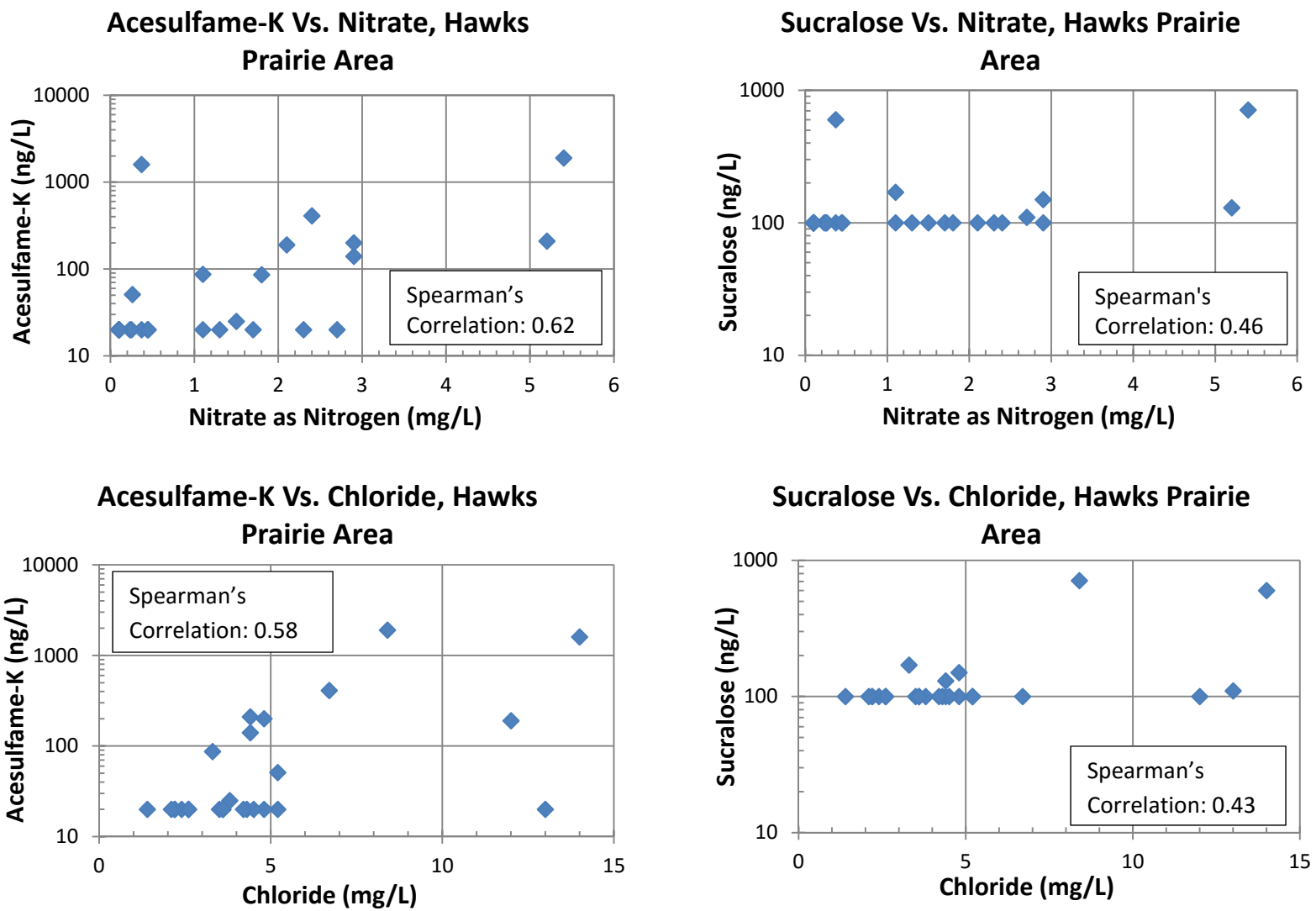


Figure 4-14. Nitrate and chloride versus acesulfame-K and sucralose at Hawks Prairie Study Area residential wells, public supply wells, and Salmon Lane Spring.

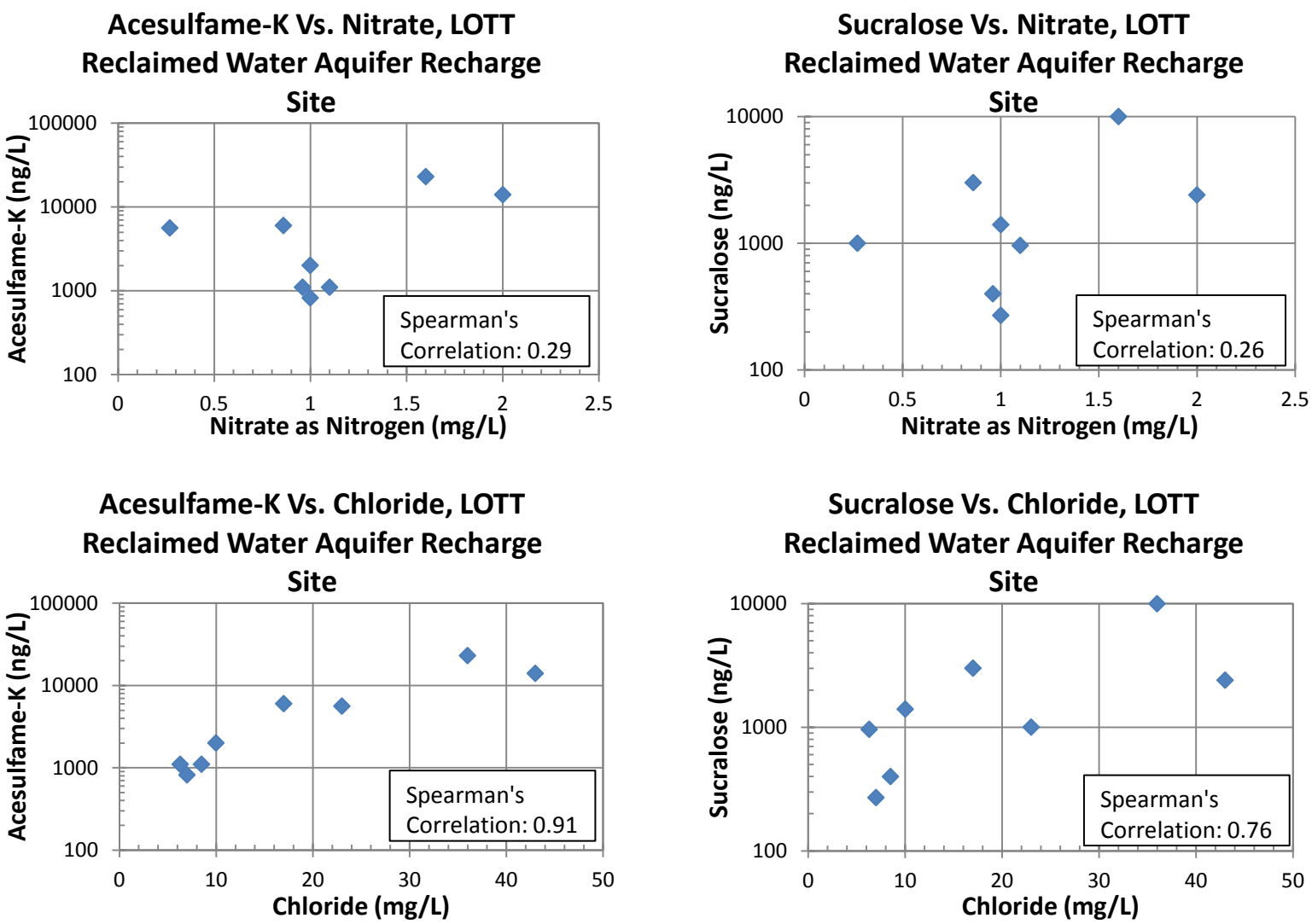
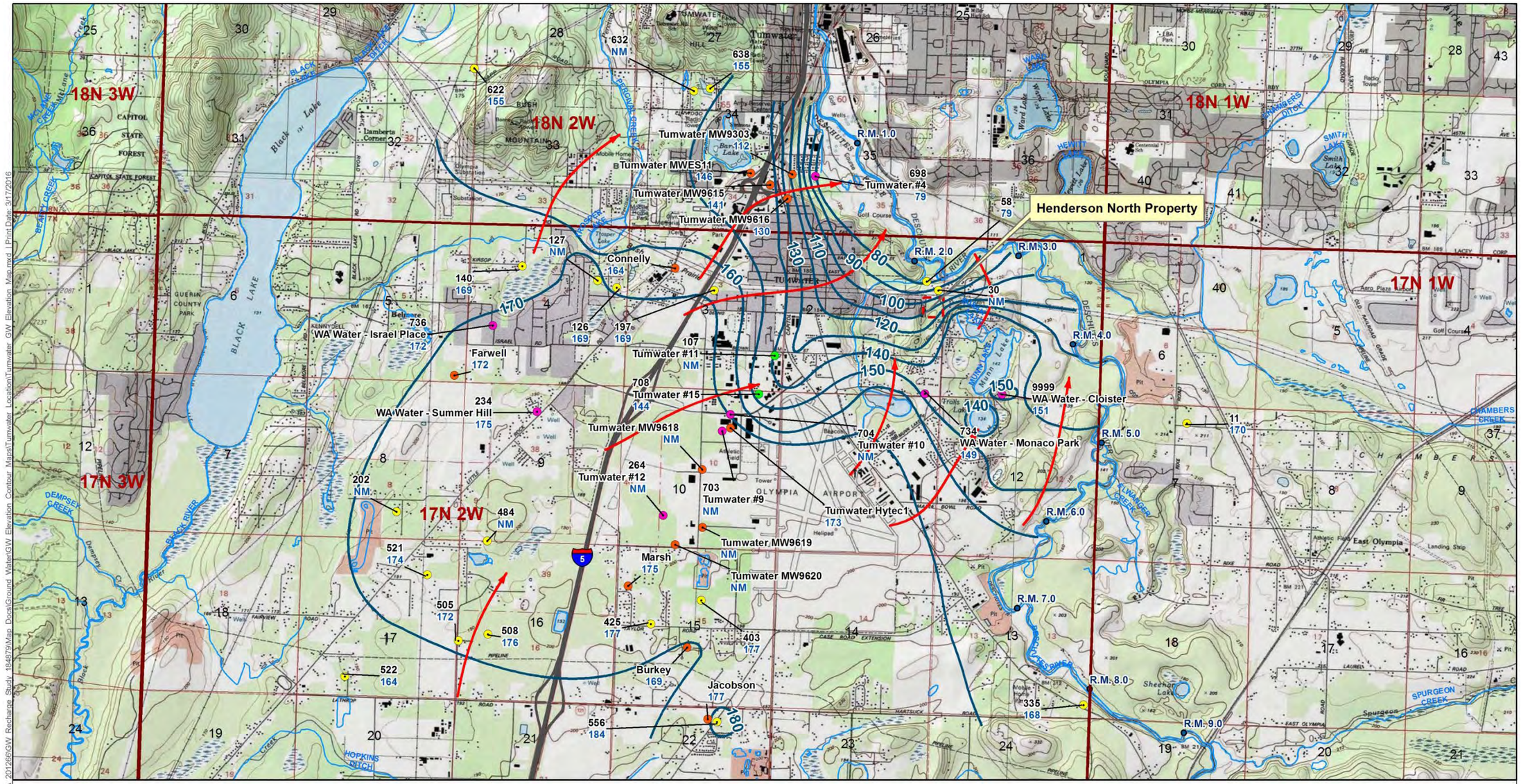


Figure 4-15. Nitrate and chloride versus acesulfame-K and sucralose at LOTT Hawks Prairie Reclaimed Water Aquifer Recharge facility monitoring wells sampled on November 2013 prior to restarting reclaimed water infiltration on the site.



Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).

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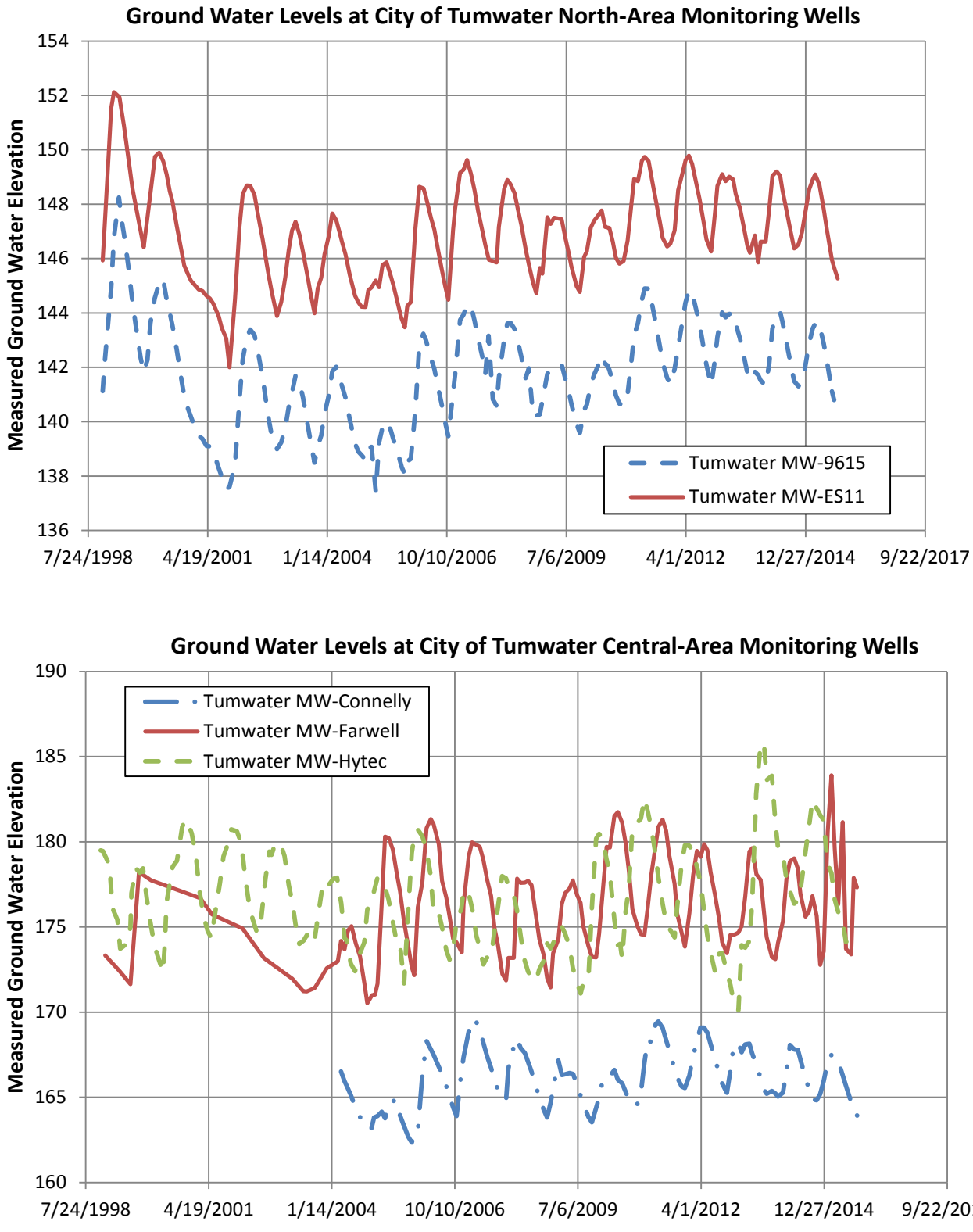

Figure 4-17. Seasonal groundwater levels recorded in City of Tumwater monitoring wells.

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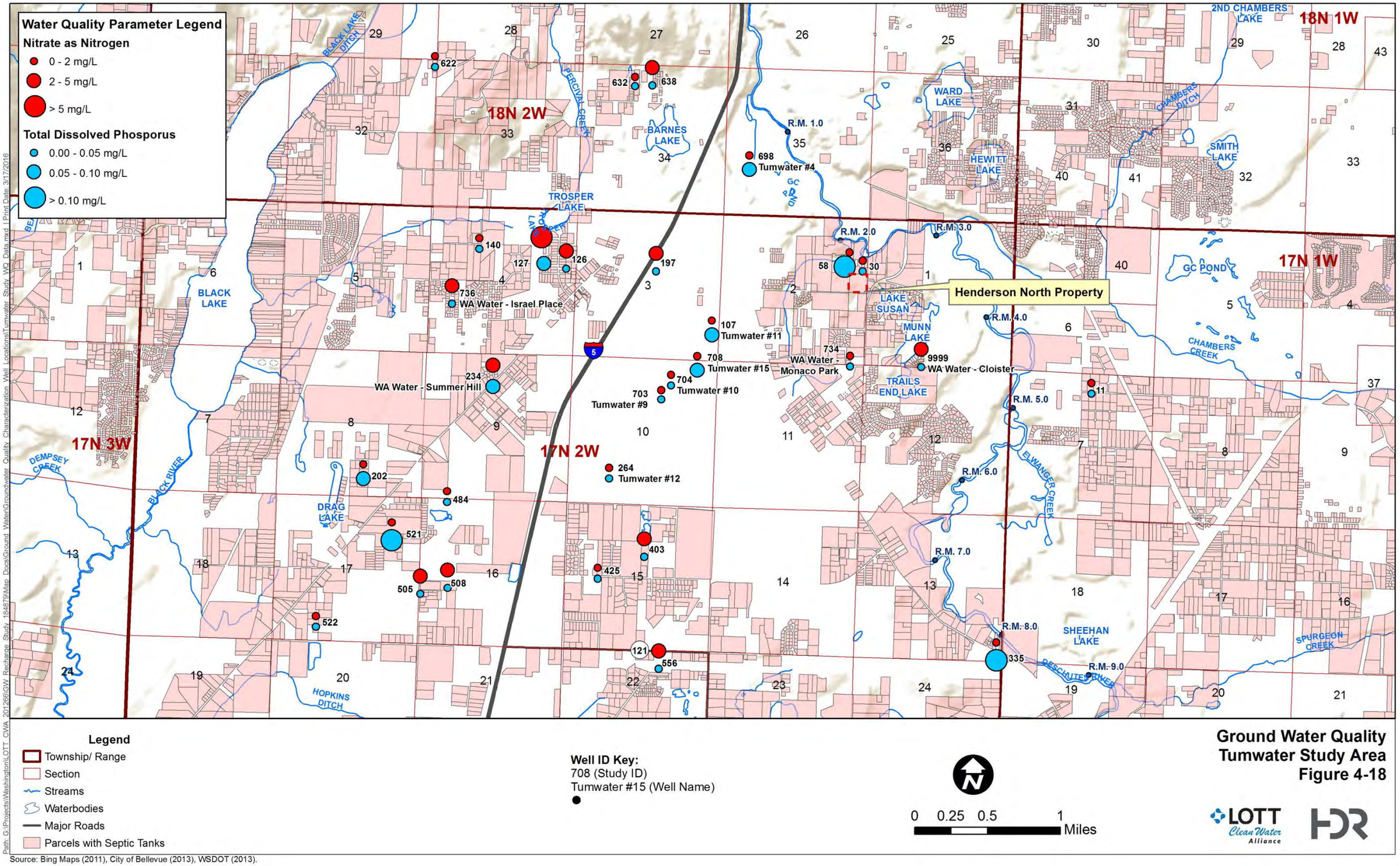
Water Quality Parameter Legend
Nitrate as Nitrogen
0 - 2 mg/L
2 - 5 mg/L
> 5 mg/L
Total Dissolved Phosporus
0.00 - 0.05 mg/L
0.05 - 0.10 mg/L
> 0.10 mg/L
18N 2W
18N 1W
17N 3W
17N 2W
17N 1W
BLACK LAKE DITCH
PERCIVAL CREEK
BARNES LAKE
TROSPER LAKE
WARD LAKE
HEWITT LAKE
2ND CHAMBERS LAKE
CHAMBERS DITCH
SMITH LAKE
GC POND
LAKE SUSAN
MUNN LAKE
TRAILS END LAKE
CHAMBERS CREEK
BLACK LAKE
DEMPSEY CREEK
BLACK RIVER
DRAG LAKE
HOPKINS DITCH
ELWANGER CREEK
SHEEHAN LAKE
SPURGEON CREEK
DESCHUTES RIVER
R.M. 1.0
R.M. 2.0
R.M. 3.0
R.M. 4.0
R.M. 5.0
R.M. 6.0
R.M. 7.0
R.M. 8.0
R.M. 9.0
Henderson North Property
622
632
638
698
Tumwater #4
140
127
126
197
736
WA Water - Israel Place
58
30
107
Tumwater #11
708
Tumwater #15
734
WA Water - Monaco Park
9999
WA Water - Cloister
234
WA Water - Summer Hill
704
Tumwater #10
703
Tumwater #9
11
202
484
521
505
508
522
264
Tumwater #12
403
425
121
556
335
Legend
Township/ Range
Section
Streams
Waterbodies
Major Roads
Parcels with Septic Tanks
Well ID Key:
708 (Study ID)
Tumwater #15 (Well Name)
0 0.25 0.5 1 Miles
Ground Water Quality
Tumwater Study Area
Figure 4-18
LOTT Clean Water Alliance
Source: Bing Maps (2011), City of Bellevue (2013), WSDOT (2013).
Path: G:\Projects\Washington\LOTT_CWA_201286\GW_Recharge_Study_184879\Map_Docs\Ground_Water\Groundwater_Quality_Characterization_Well_Locations\Tumwater_Study_WQ_Data.mxd | Print Date: 3/17/2016

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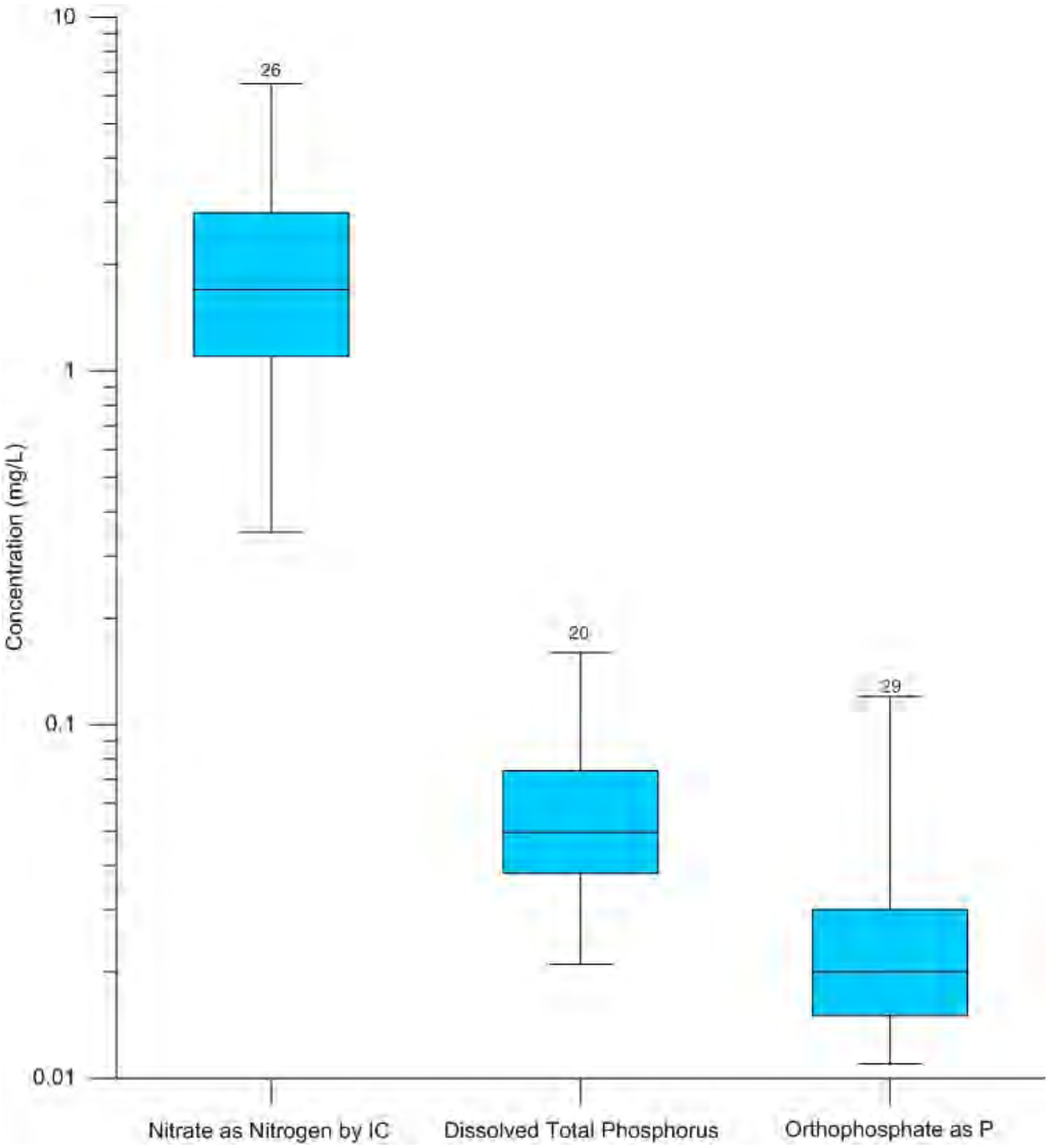

Figure 4-19. Nitrate and phosphorus concentrations from residential and public supply wells in Tumwater Study Area. (# samples with detections above MRL, max., 75%, 50%, 25% percentile and min. values).

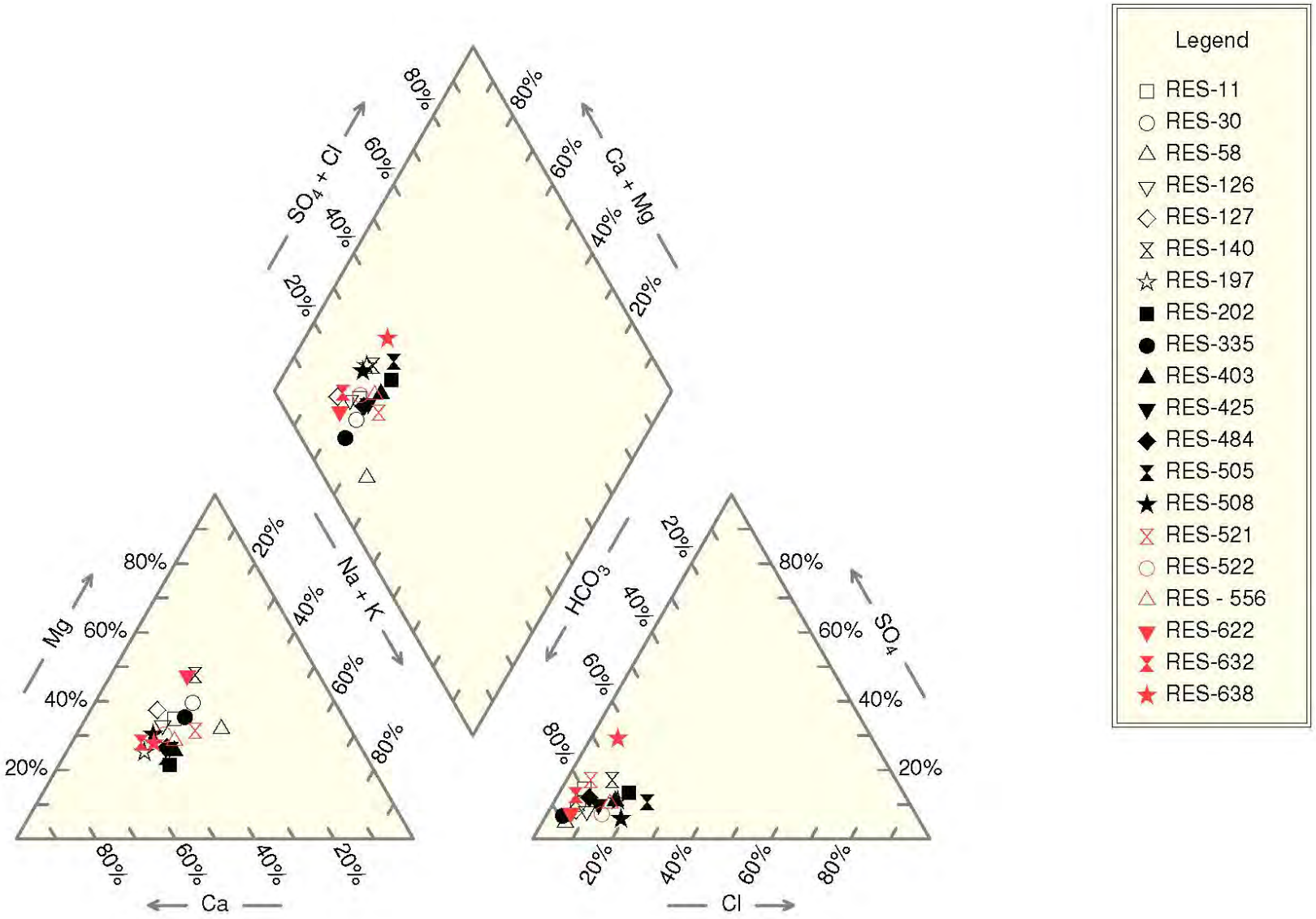

Figure 4-20. Piper diagram showing major ion geochemistry of groundwater samples from the Tumwater Study Area residential wells.

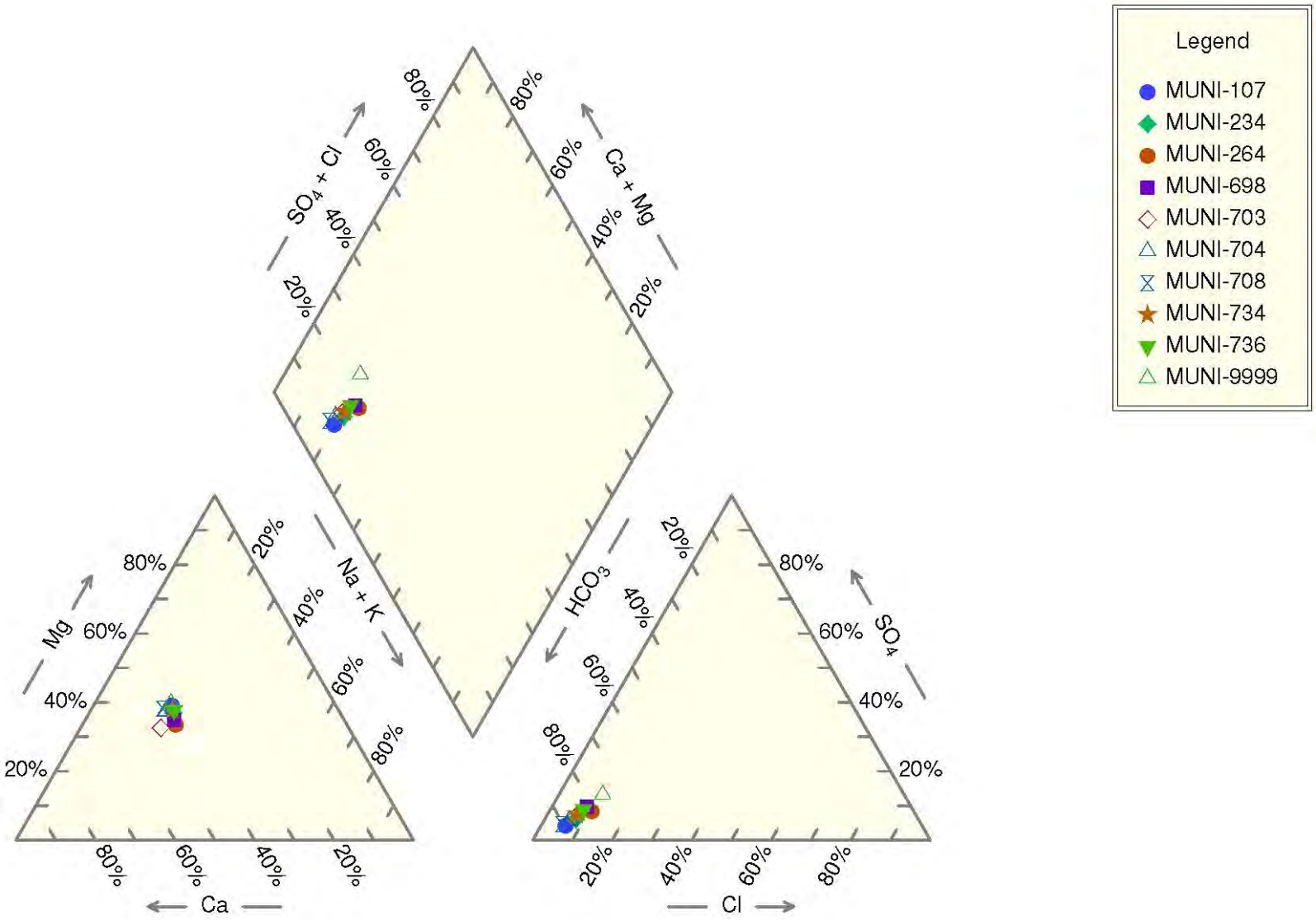

Figure 4-21. Piper diagram showing major ion geochemistry of groundwater samples from the Tumwater Study Area public supply wells.

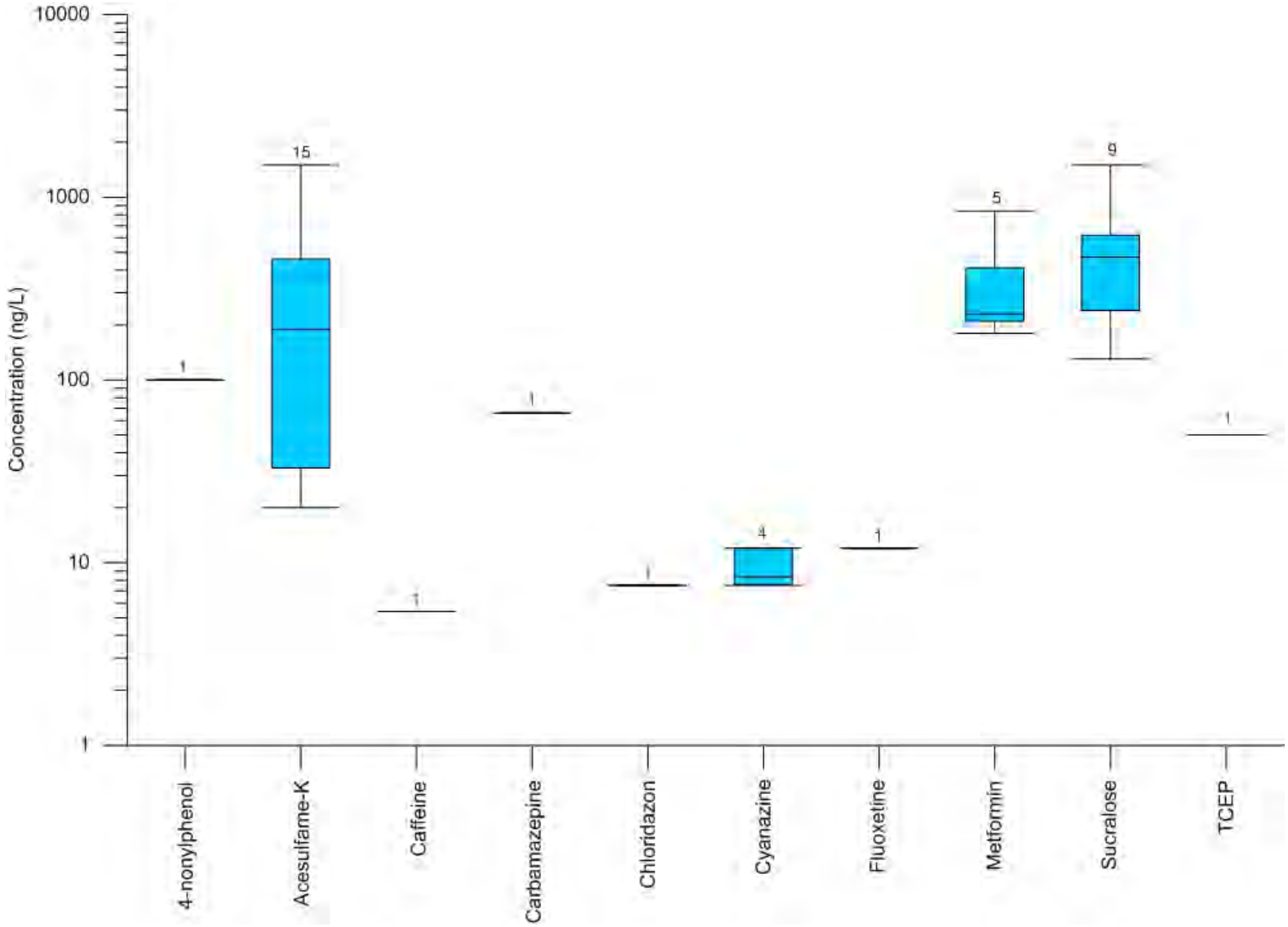

Figure 4-22. Residual chemical concentrations from residential and public supply wells in Tumwater Study Area (# samples with detections above MRL, max., 75%, 50%, 25% percentile and min. values).

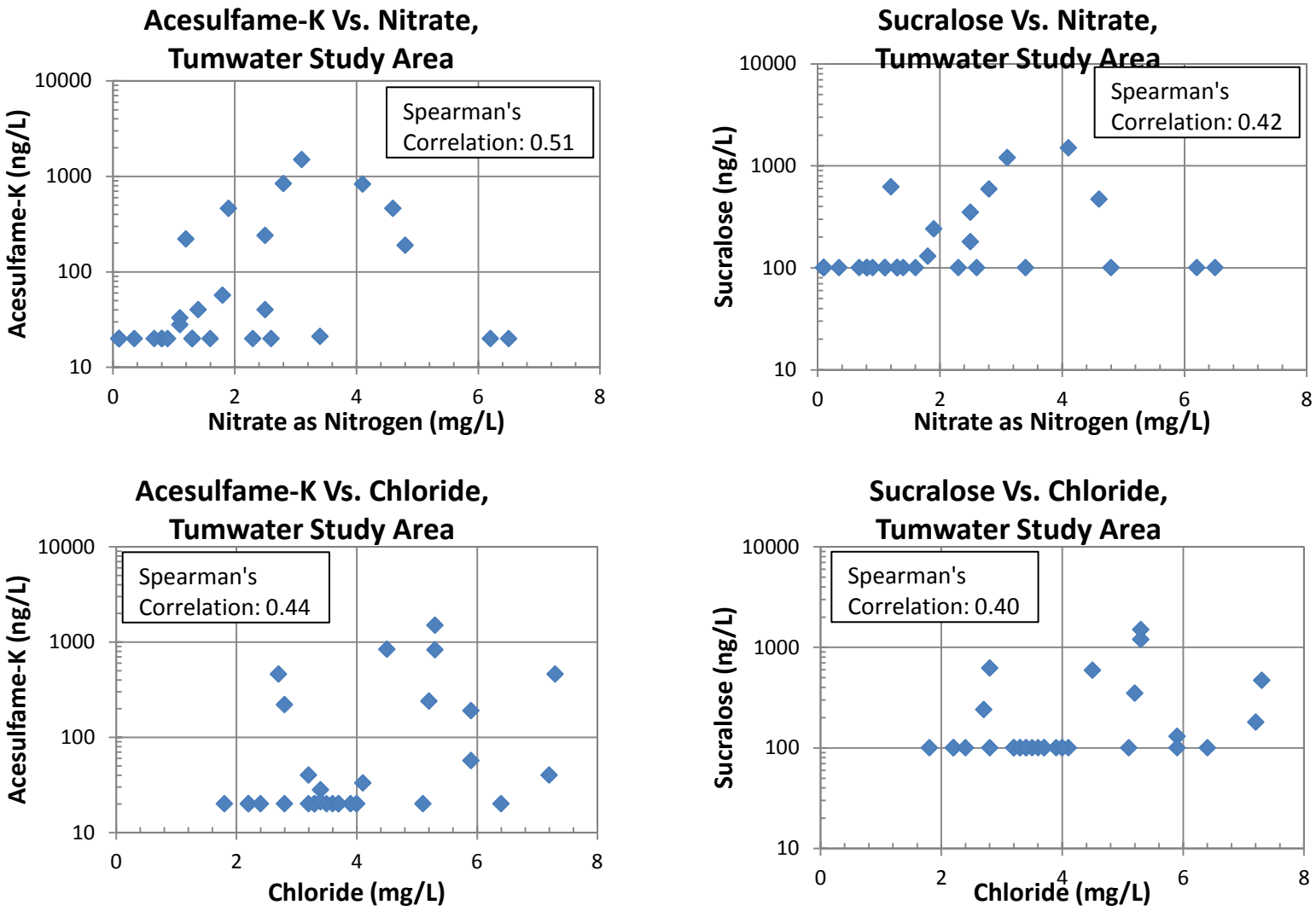

Figure 4-23. Nitrate and chloride versus acesulfame-K and sucralose at the Tumwater Study Area residential wells and public supply wells.

5.0 Comparison to Other Studies of Residual Chemicals in Groundwater

Six regional studies that evaluate the presence of residual organic chemicals in groundwater were identified from the literature. The data from these studies are not directly comparable to each other, because the analytical parameter list and the MRL for each study varies considerably. However, the results are useful to generally describe the presence of residual organic chemicals in groundwater. These case-studies are summarized on Table 5-1 and include:

- Two large studies evaluating the presence of residual chemicals in 1,034 and 1,497 drinking water wells across the United States from the period 1992 to 1999.
- One study with 47 wells across the US from year 2000.
- One study in California with 1,231 samples collected from public supply wells from 2004 to 2010.
- Two studies from Cape Cod, Massachusetts, with groundwater samples collected from 20 public supply wells and 20 residential wells.

Table 5-2 compares the results from the Tumwater and Hawks Prairie Study Area with the findings from these regional studies. Only those compounds with detections in both this study and the literature are presented in Table 5-2.

- Nitrate concentrations were within the range reported on Cape Cod, Massachusetts. The study area for Cape Cod is rural-residential with many houses served by septic tanks. Nitrate concentrations were not reported for the other study areas.
- The concentrations for the sweetener compound acesulfame-K reported by Schaider et al. (2014) were more than the results identified in the Hawks Prairie and Tumwater Study Area.
- The pharmaceutical carbamazepine was identified with a similar concentration in the Hawks Prairie and Tumwater Study Areas as in the literature study results.
- The herbicide cyanizine was detected at concentrations similar to the literature study results.

Table 5-3 provides a summary for all of the compounds detected in the six study results reported in the literature. The results show that pharmaceuticals, antibiotics, pesticides/herbicides, PFCs and flame retardants have been detected in the regional groundwater wells sampled for these six studies.

Table 5-1. Summary of case-studies of residual chemicals (organic compounds) in regional groundwater wells.

Author	Schaider et al., 2014	Schaider et al., 2011	Barnes et al. (2008)	Fram and Belitz (2011)	Kolpin et al. (1998)	Squillace et al. (2002)
Location	Cape Cod, MA	Cape Cod, MA	United States National Survey	California	United States National Survey	United States National Survey
Year Samples Collected	2009	2011	2000	2004 to 2010	1993-1995	1992-1999
Well Type	Public Supply Wells	Residential Wells	Residential and public supply	Public supply wells	Public supply wells	Residential and public supply
Aquifer Type	Shallow unconfined sand and gravel	Shallow unconfined sand and gravel	Variable	Variable	Variable	Variable
No. of samples	20	20	47	1231	1034	1497
No. of residual compounds tested	92	121	65	14	41	82
No. of residual chemical detected	18	27	36	7	34	63
Types of parameters analyzed	Pharmaceuticals, flame retardants, perfluorinated compounds.	Pesticides, herbicides	Pharmaceuticals, pesticides	Pharmaceuticals	Pesticides, herbicides	Pesticides

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Table 5-2. Comparison of residual chemicals (organic compounds) in regional groundwater wells reported in literature case studies with the findings from the Hawks Prairie and Tumwater Study Area.

	Hawks Prairie & Tumwater Groundwater Study Area Results				Schaider et al. (2014)			Schaider et al. (2011)			Barnes et al. (2008)			Fram and Belitz (2011)			Kolpin et al. (1998)			Squillace et al. (2002)		
	MRL	Min	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)
Nutrients (mg/L)																						
Nitrate	0.1	0.23	6.5	78.3	0.1	5.3	100	0.1	11	100												
Sweeteners (ng/L)																						
Acesulfame-K	20	36	1900	51.7				0.42	5300	85												
Pharmaceuticals (ng/L)																						
Carbamazepine	5	5.2	66	6.7	1	72	25	0.068	62	25				0.03	420	1.46						
Fluoxetine	10		12	1.7							18	56	4.3									
Stimulants (ng/L)																						
Caffeine	5		5.4	1.7							14	130	12.8	0.1	290	0.24						
Alkylphenols (ng/L)																						
4-nonylphenol	100		100	1.7	250	20	14															
Plasticizers (ng/L)																						
Bisphenol A	10	10	53	5.0				2.5	4	15	500	1340	14.9									
Herbicide/Pesticide (ng/L)																						
Cyanazine	5	7.5	15	11.7													4	52	1.6	5	13	0.6

Table 5-3. Residual chemicals (organic compounds) in regional groundwater wells reported in literature case studies.

	Schaider et al. (2014)			Schaider et al. (2011)			Barnes et al. (2008)			Fram and Belitz (2011)			Kolpin et al. (1998)			Squillace et al. (2002)		
	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)
Nutrients (mg/L)																		
Nitrate	0.1	5.3	100	0.1	11	100												
Sweeteners (ng/L)																		
Acesulfame-K				0.42	5300	85												
Pharmaceuticals/Stimulants (ng/L)																		
Acetaminophen							9	380	6.4	0.06	1890	0.32						
Albuterol							29	ND	0	0.04	ND	ND						
Antipyrine	1	1	5	0.83	2	5												
Anenolol	0.1	0.8	5															
Caffeine							14	130	12.8	0.1	290	0.24						
Carbamazepine	1	72	25	0.07	62	25				0.03	420	1.46						
Codeine							240	ND	0	0.023	214	0.16						
Cotinine				0.59	1	5	23	23	2.1	0.019	ND	ND						
Dehydronifedipine							10	22	4.3	0.04	ND	ND						
1,7-Dimethlyxanthine							18	57	4.3									
Diltiazem							12	28	2.1	0.04	ND	ND						
Fluoxetine							18	56	4.3									
Gemfibrozil	0.5	1.2	5	0.15	0.3	5	15	ND	0									
Ibuprofen							18	3110	2.1									
Meprobamate	0.1	5.4	20	0.1	2	15												
Phenytoin	2	66	20															
Primidone				2.1	9	10												
p-Xantine										0.02	120	0.08						
Salicylci acid				15	30	15												
Simvastatin				3	14	5												
Sulfamethoxazole										0.08	170	0.14						
Thiabendazole										0.03	ND	ND						
Trimethoprim										0.017	180	0.018						
Warfarin							1	ND	0	0.05	ND	ND						
Antibiotics (ng/L)																		
Lincomycin							50	320	5.4									
Monensin				0.52	0.8	5												
Sulfamethazine							50	360	2.7									
Sulfamethizole	1	1	5															
Sulfachloroyridazine				0.58	0.7	10												

	Schaider et al. (2014)			Schaider et al. (2011)			Barnes et al. (2008)			Fram and Belitz (2011)			Kolpin et al. (1998)			Squillace et al. (2002)		
	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)
Sulfamethoxazole	0.1	113	60	0.1	60	45	23	1110	23.4									
Sulfathiazole				0.27	0.2	5												
Triclosan							1000	1000	14.9									
Trimethoprim	0.1	0.7	5	0.1	1	5												
Personal Care Products (ng/L)																		
DEET	5	6	5	5	6	5	600	1300	34.8									
Flame Retardants (ng/L)																		
2-EHDP				1.5	18	10												
TBP				5.1	11	5												
TBEB	50	50	5															
TCEP	2	20	15				500	737	29.8									
TCPP	10	40	20															
TDPP	10	10	5				500	<500	4.3									
TEP	10	20	25	10	38	5												
TPP				1.5	14	5	500	<500	2.1									
Perfluorinated Compounds (ng/L)																		
PFBS				0.22	23	55												
PFHpA				0.25	1	30												
PFHxS				0.33	4	55												
PFHxA				0.16	2	50												
PFOA	10	22	10															
PFOS	1	97	40	0.24	7	55												
Alkylphenols (ng/L)																		
4-nonylphenol	250	20	14															
Plasticizers (ng/L)																		
Bisphenol A				2.5	4	15	500	1340	14.9									
Herbicide/Pesticide (ng/L)																		
Acetochlor																4	32	0.2
Alachor													2	55	2.4	3	10	1.9
Aldicarb sulfone																	40	0.1
Aldicarb sulfoxide																140	180	0.2
Atrazine													1	3600	38.2	1	17	22.8
Azinphos-methyl													1		0			
Benfluralin													2	4	0.1		6	0.1
Bentazon																	50	1.3
Bromacil																20	170	1.2

	Schaider et al. (2014)			Schaider et al. (2011)			Barnes et al. (2008)			Fram and Belitz (2011)			Kolpin et al. (1998)			Squillace et al. (2002)		
	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)
Butylate													2	2	0.2	2	24	0.1
Carbaryl							1000	1000	2.1				3	21	1.1	3	23	0.7
Carbofuran													3	1300	0.7	7	20	0.6
Chlorpyrifos							500	ND					4	6	0.2	4	4	0.2
Cyanazine													4	52	1.6	5	13	0.6
2,4-D																10	130	0.3
DCPA													2	10000	0.8	1	11	23.8
p,p'-DDE																1	1	2.4
Deethylatrazine																2	13	1.9
Diazinon							500	ND					2	77	0.7	2	13	1.9
Dichlobenil																20	40	0.2
Dichlorprop																	100	0.1
Dieldrin													1	45	1.4	2	9	1.6
2,6-Diethylaniline																1	3	0.3
Dinoseb																40	120	0.7
Disulfoton													17		0		10	0.1
Diuron																	50	2.9
EPTC													2	450	1.5	1	6	0.8
Ethalfluralin													4	90	0.3		90	0.1
Ethoprophos													3	9	0.1		9	0.1
Fenuron																	50	0.9
Fluometuron																40	70	0.3
Fonofos													3	9	0.1		2	0.1
alpha-HCH																33	46	0.1
3-Hydroxycarbofuran																30	50	0.2
Lindane													4		0		152	0.1
Linuron													2	29	0.3	12	21	0.1
Malathion													5	4	0.2	9	11	0.1
Methiocarb																	30	0.1
Methomyl																	100	0.1
Metolachlor													2	5400	14.6	1	7	7.6
Metribuzin													4	300	3.1	5	15	1.3
Molinate													4		0	2	4	0.1
Napropamide													3	14	0.2		5	0.1
Neburon																	30	0.1
Norflurazon																30	40	0.2
Oryzalin																	30	0.1

	Schaider et al. (2014)			Schaider et al. (2011)			Barnes et al. (2008)			Fram and Belitz (2011)			Kolpin et al. (1998)			Squillace et al. (2002)		
	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)	MRL	Max	Detect Freq (%)
Oxamyl																30	780	0.2
Pebulate													4	52	0.4	8	30	0.1
Pendimethalin													4	12	0.2		9	0.1
cis-Permethrin													5	7	0.2			
Picloram																50	110	0.2
Prometon													18	40000	13.9	2	12	8.5
Pronamide													3	52	0.1			
Propachlor													7	4	0.3	2	3	0.1
Propanil													4	15	0.7	3	6	0.5
Propargite													13	9	0.1			
Propham																	40	0.1
Propoxur																	40	0.1
Propyzamide																	13	0.1
Simazine													5	1300	18	1	11	11.8
Terbacil													7	330	0.9	5	15	0.7
Terbufos													13	8	0.1			
Teuthiuron													10	350	2.2			
Terbacil													7	330	0.9	5	15	0.7
Thiobencarb													2	2	0.1			
2-(2,4,5-Trichlorophenoxy)																	60	0.1
Trillate													1	2	0.5			
Triflurain													2	14	0.5	2	7	0.3
Surfactant (ng/L)																		
4-Octylphenol Diethoxylate							1000	1000	4.3									

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6.0 Summary

A groundwater quality characterization was completed during the summer and fall of 2015, in two areas in northern Thurston County, Washington. The Hawks Prairie Study Area is between the Woodland Creek and McAllister Creek drainages and includes the currently operating LOTT Hawks Prairie Ponds and Recharge Basins. The Tumwater Study Area drains into the Deschutes River and includes a proposed LOTT future aquifer recharge site.

Hawks Prairie Study Area

An Upper (Qva/Qvr) Aquifer, a Sea Level (Qc) Aquifer and a Deep (TQu) Aquifer is present in the Hawks Prairie Study Area. The Upper Aquifer is used for a water supply by residential wells and a few public supply wells and the Sea Level and the Deep Aquifer are used for water supply mainly by public supply wells. Measured groundwater levels indicate that groundwater in the Upper Aquifer flows towards and discharges to either to Woodland Creek to the west or to McAllister Creek to the east. The groundwater table is shallow and spring flow emerges from Woodland Creek south of I-5 at Beatty Springs, Martin Springs and at a large wetland complex. Dense residential septic tanks and high groundwater levels have led to elevated nitrate concentrations, which have been identified as a water quality issue in the southeast part of the Hawks Prairie Study Area in prior reports. Groundwater discharging into Woodland Creek has been identified as a major source of nutrients in the creek. The deeper Sea Level (Qc) Aquifer flows east and discharges to McAllister Creek. The Deep (TQu) Aquifer flows north and discharges to the Puget Sound.

A total of twenty-seven groundwater (or spring) samples were collected from the Hawks Prairie Study Area. Groundwater quality in the Hawks Prairie Study Area is generally good and, in almost all cases (exceptions noted below), meets the State and Federal drinking water quality standards and State groundwater quality standards. The groundwater is predominately a calcium/magnesium and bicarbonate geochemical type which indicates a high degree of groundwater recharge by precipitation. Nitrate concentrations are reported from less than 0.1 to 5.4 mg/L in the Upper Aquifer groundwater and at 1.1 mg/L at the Salmon Lane springs. Total phosphorus concentrations are reported at less than 0.02 to 0.64 mg/L in the Upper Aquifer groundwater and at less than 0.02 mg/L at the Salmon Lane springs. Elevated nutrient concentrations are mainly observed in areas with residential septic tanks. The results of this study support the findings of prior studies by Drost (1988), Thurston County (1999), PGG (2002; 2007) and Sargeant (2006) that indicate that elevated nutrient concentrations in the Woodland Creek Basin remains a significant groundwater quality issue.

Indicator bacteria were found in three groundwater well samples and both spring samples. Metals were below the State and Federal drinking water standards, with the exception of one detection of arsenic at 28 ug/L, two detections of iron and ten detections of manganese (water quality issues with iron and manganese are primarily related to odor, taste and color). Arsenic was above the groundwater standard for an additional 12 samples.

The residual chemicals most-frequently detected were the sweeteners acesulfame-K and sucralose (11 and 7 detections, respectively) at concentrations of up to 1,900 nanograms per

liter (ng/L) and 710 ng/L, respectively. The next most-frequent residual compounds detected were the flame retardant TCPP, detected four times at concentrations up to 150 ng/L, and the herbicide cyanazine, also detected four times, at concentrations up to 15 ng/L.

Compounds detected twice were azithromycin (antibiotic), BPA (plasticizer chemical), erythromycin (antibiotic), metformin (antidiabetic pharmaceutical), and quinoline (phosphate pesticide). Compounds detected once included 4-tert-octylphenol (surfactant), atenolol (blood pressure pharmaceutical), gemfibrozil (high cholesterol medication, propazine (herbicide), and propylparaben (a preservative).

LOTT Hawks Prairie Ponds and Recharge Basin Site

A comparison was made with the residual compounds identified in the Hawks Prairie Study Area groundwater samples and the samples collected from the LOTT Hawks Prairie Ponds and Recharge Basins in November 2013 after reclaimed water infiltration had been "off" about one year. The compounds acesulfame-K and sucralose were detected in higher concentrations than the regional groundwater samples (up to 23,000 and 10,000 ng/L, respectively) and higher concentrations were observed in LOTT monitoring wells furthest downgradient from the rapid infiltration basins. The pharmaceuticals carbamazepine (an anti-seizure drug) and sulfamethoxazole (an antibiotic) were also detected at higher concentrations and more frequently. Carbamazepine (anti-seizure pharmaceutical) had five detections up to 78 ng/L in eight samples and sulfamethoxazole (antibiotic pharmaceutical) was detected in four of eight samples at up to 110 ng/L. Primidone (anti-convulsant pharmaceutical) was reported with four detections in eight samples at concentrations up 52 ug/L. The flame retardants TCEP and TDCPP were detected at lower concentrations than in the regional study area groundwater samples (up to 36 and 960 ng/L with two and one detections, respectively).

Tumwater Study Area

In the Tumwater Study Area many residential wells and public supply wells utilize the Upper (Qva/Qvr) Aquifer for water supply. Measured groundwater levels indicate that groundwater flows to the west into the Deschutes River and groundwater gains to the river are a significant portion of the river flow. Nutrient concentrations in groundwater have been reported as elevated in some areas. Nutrient concentrations in the Deschutes River have been identified as a water quality issue, and the majority of nutrients in the lower reach of the river are contributed from groundwater.

A total of thirty groundwater samples were collected from the Tumwater Study Area. Groundwater quality in the Tumwater Study Area is generally good and, in almost all cases (exceptions noted below), meets the State and Federal drinking water quality standards and State groundwater quality standards. The groundwater is predominately a calcium/magnesium and bicarbonate geochemical type indicating frequent groundwater recharge by precipitation. Nitrate concentrations range from 0.1 to 6.5 mg/L and total phosphorus ranged from below 0.02 to 0.13 mg/L. Elevated concentrations of nutrients are mostly associated with areas with residential development on septic tanks. The results confirm the findings of prior studies (AESI, 1997) and provide further evidence regarding the role of groundwater in nutrient loading to the Deschutes River as identified by Roberts et al. (2012).

Metals were below the State and Federal drinking water standards with the exception of three detections of iron and four detections of manganese. Fecal coliform bacteria were detected in one groundwater sample from a residential well. Coliform bacteria were detected in eight of the wells sampled (7 residential wells and 1 public supply well). Arsenic was above the groundwater standard (but below the drinking water standard) in four samples. The residual chemicals most-commonly detected in groundwater were acesulfame-K and sucralose with 15 and 9 detections, respectively, and at concentrations for up to 1,500 ng/L and metformin which was detected in five wells at concentrations up to 840 ng. Carbamazepine, TCEP and 4-nonlyphenol were detected at 50 to 100 mg/L and other compounds were detected at much lower concentrations including caffeine, chloridazon and fluoxetine. Other organic compounds were not detected in groundwater.

Comparison of Results to Published Studies from Other Areas

The results from the groundwater sampling and analyses of residual (organic) chemicals from public supply and residential wells were compared with the results reported in the literature from six other studies that sampled residual chemicals in groundwater wells in other regions of the United States. Seven residual chemicals were detected in groundwater in both the studies reported in the literature and in the Tumwater/Hawks Prairie Study Area wells. The results of the six regional studies show that many pharmaceuticals, antibiotics, pesticides/herbicides, PFCs and flame retardants have been detected in the regional groundwater wells.

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Appendix A
Existing Hydrogeologic Information for Study Area

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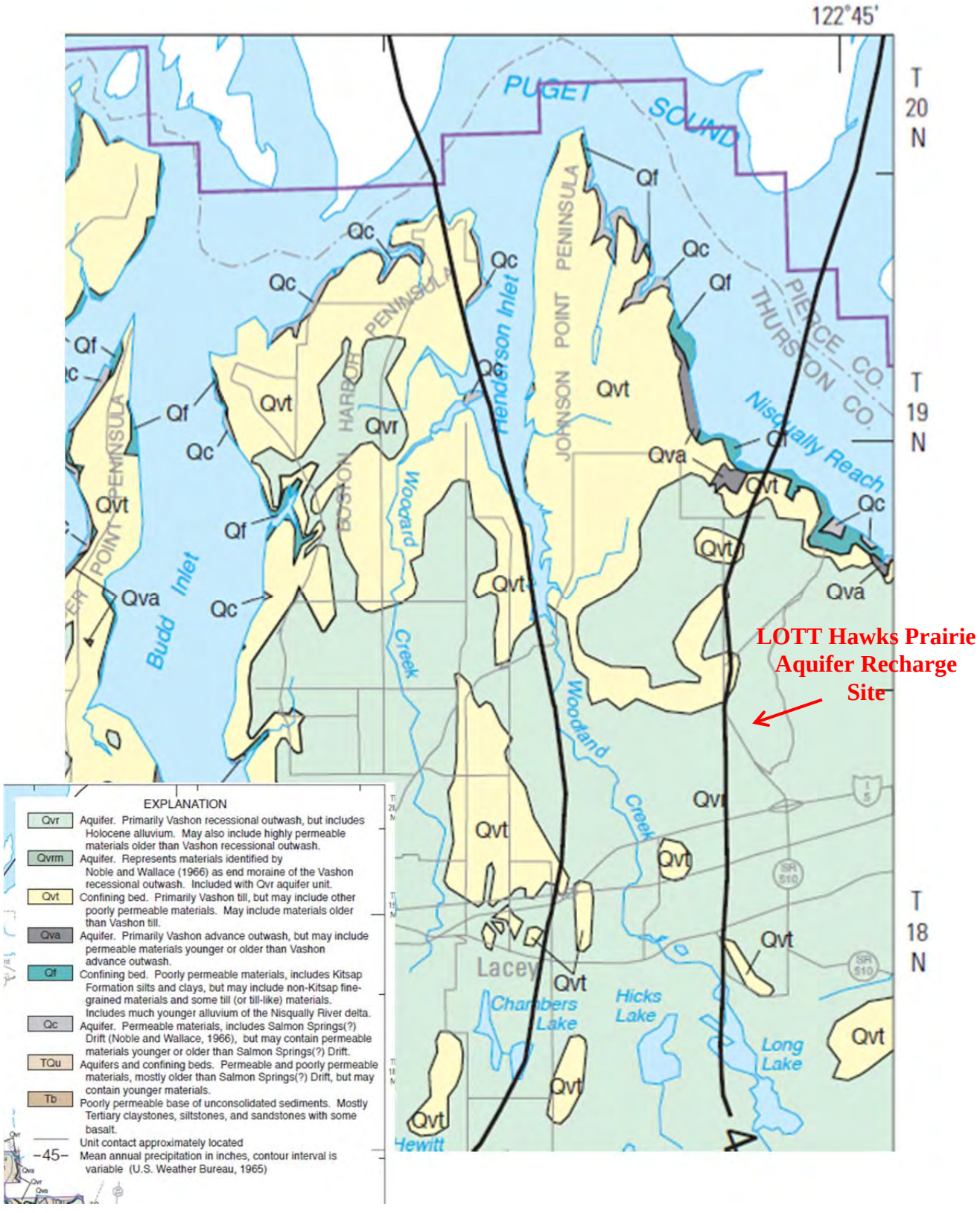

Figure A-1. Regional Surface Hydrogeology in the Hawks Prairie Study Area. (Source: Drost et al, 1999)

Series	Geologic unit		Geohydrologic unit, in this report[1]	Typical thickness (feet)	Lithologic characteristics	Hydrologic characteristics
Holocene		Alluvium	Qvr Qvrm	10-40	Alluvial and deltaic sand and gravel along major water courses. Moderately to well-sorted glacial sand and gravel, including kettled end moraine	An aquifer where saturated. Groundwater is mostly unconfined. Perched conditions occur locally.
Pleistocene	Vashon Drift	Recessional outwash and end moraine				
		Till	Qvt[2]	20-55	Unsorted sand, gravel, and boulders in a matrix of silt and clay.	Confining bed, but can yield usable amounts of water. Some thin lenses of clean sand and gravel.
		Advance outwash	Qva	10-45	Poorly to moderately well-sorted, well-rounded gravel in a matrix of sand with some sand lenses.	Ground water, mostly confined. Used extensively for public supplies near Tumwater.
	Kitsap Formation		Qf[3]	20-70	Predominantly clay and silt, with some layers of sand and gravel. Minor amounts of peat and wood.	Confining bed, but in places yields usable amounts of water.
	Salmon Springs(?) Drift (Noble and Wallace, 1966) / Deposits of "penultimate" glaciation (Lea, 1984)		Qc	15-70	Coarse sand and gravel, deeply stained with red or brown iron oxides.	Water is confined. Used extensively for industrial purposes near Tumwater.
	Unconsolidated and undifferentiated deposits		TQu	Not known	Various layers of clay, silt, sand, and gravel of both glacial and nonglacial origin.	Contains both aquifers and confining beds. Water probably confined.
Miocene and Eocene	Bedrock		Tb	Not known	Sedimentary rocks consisting of claystone, siltstone, sandstone, and minor beds of coal. Igneous bodies of andesite and basalt.	Poorly permeable base of unconsolidated sediments. Locally an aquifer, but generally unreliable. Water contained in fractures and joints. Well yields relatively

Figure A-2. Regional hydrostratigraphy of North Thurston County. (Source: Drost et al., 1999)

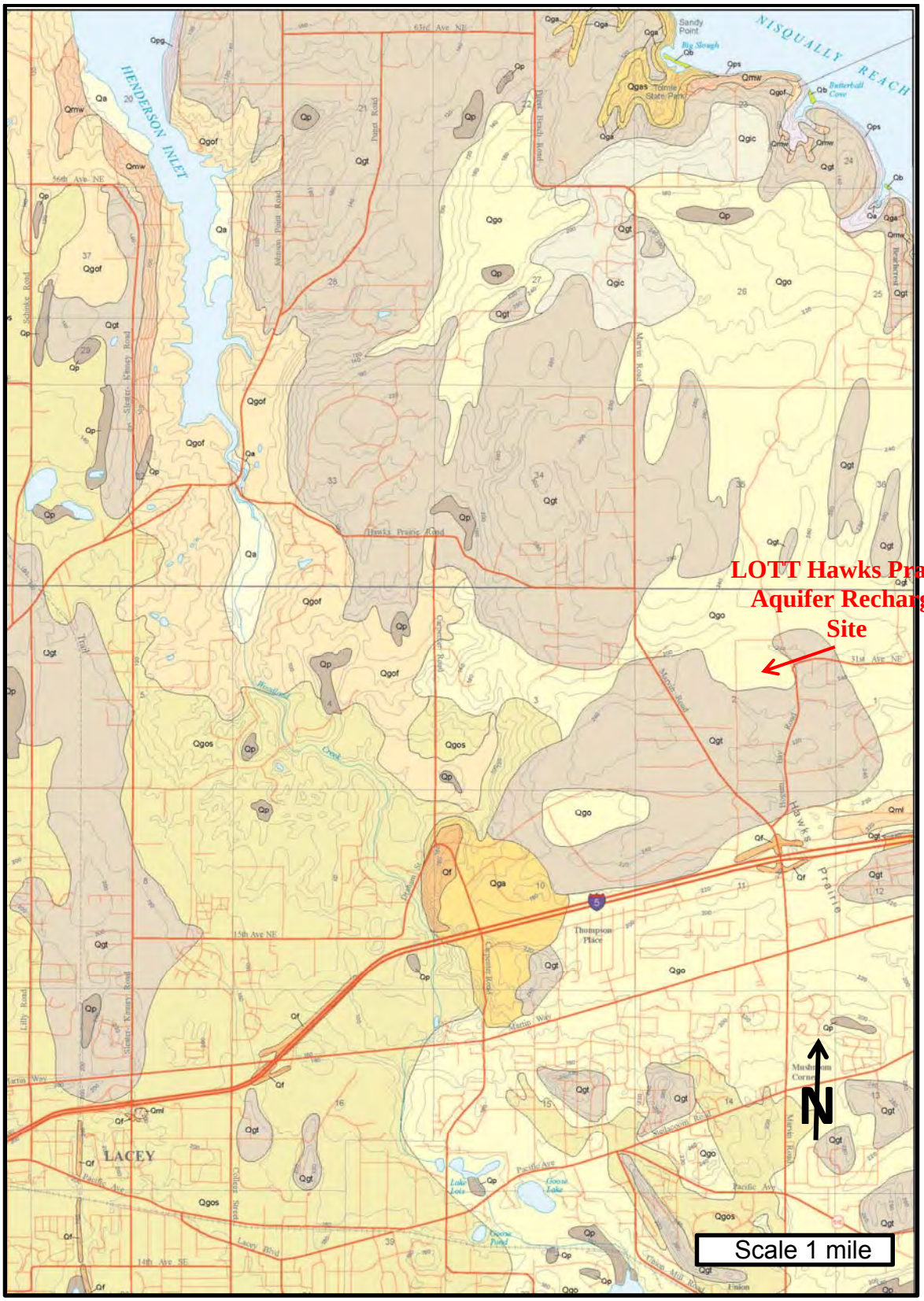

Figure A-3. More recent surface geology mapping in the Hawks Prairie Study area by WA DNR. (Source: Logan et al, 2003)

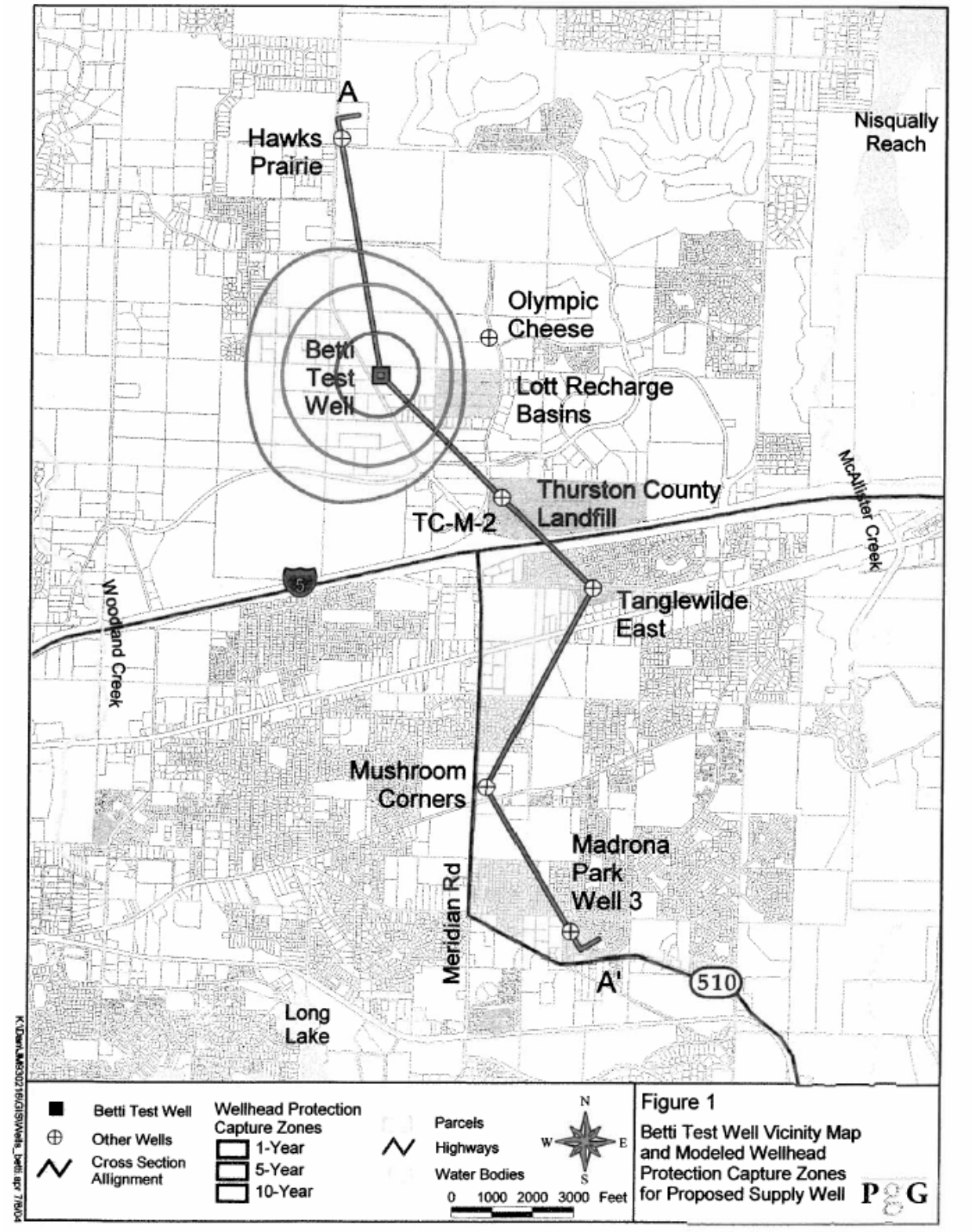

Figure A-3. Cross-section location map, Hawks Prairie Area. (Source: PGG, 2004)

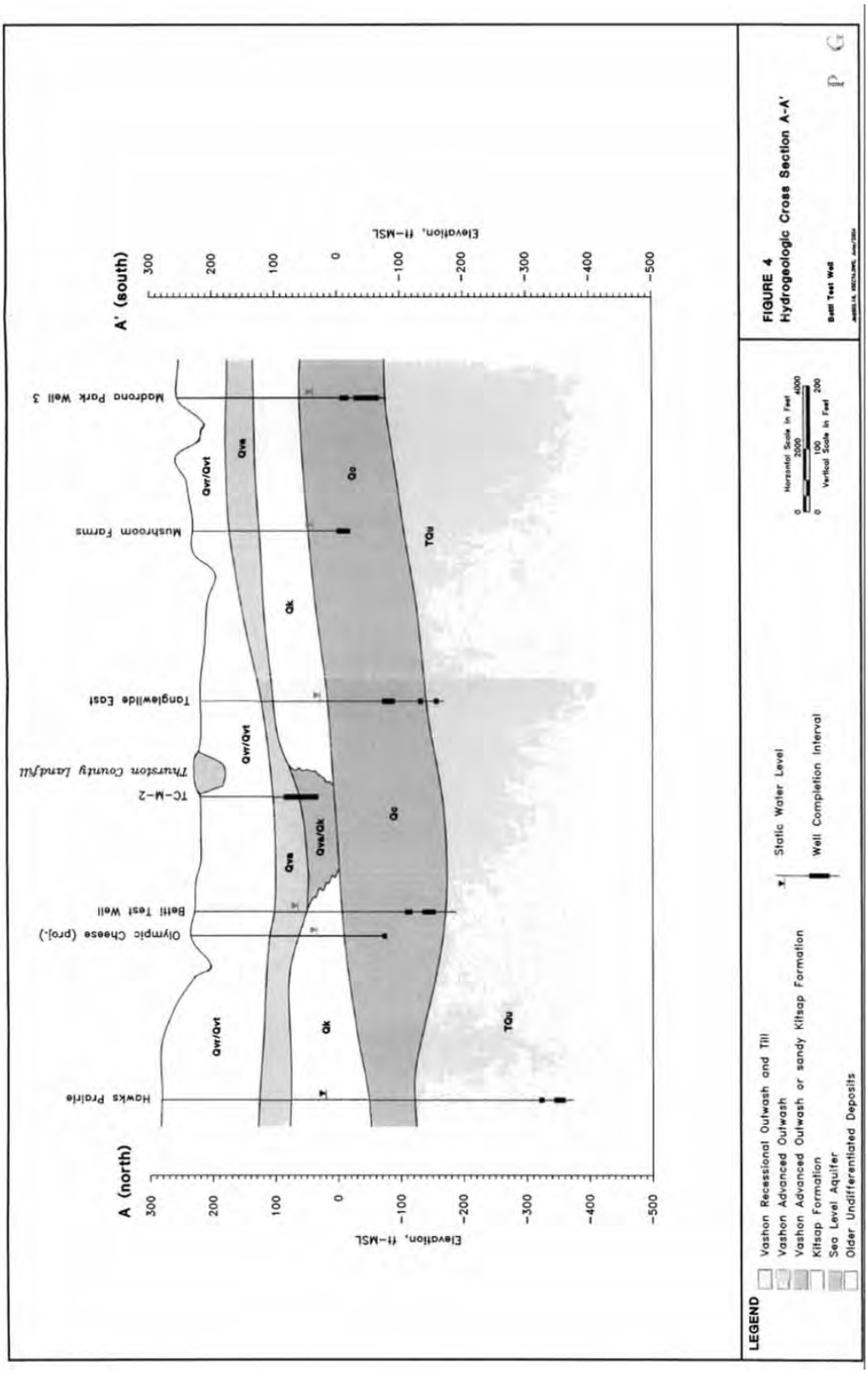

Figure A-4. Northwest to southeast cross-section A-A' in center of Hawks Prairie area. (Source: PGG, 2004)

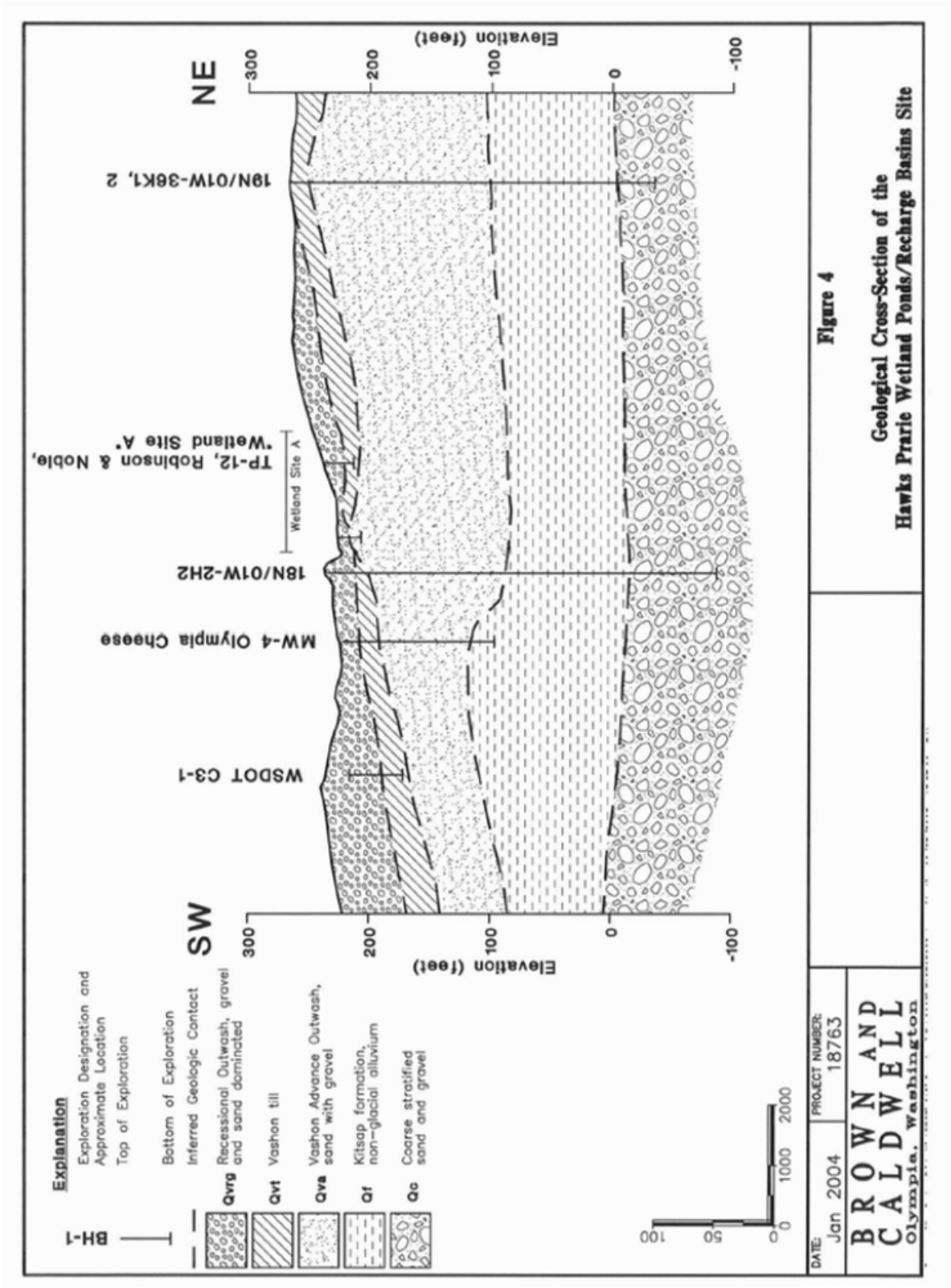

Figure A-5. Northeast-southwest cross-section across Hawk's Prairie Recharge Basin. (Source: B&C, 2004)

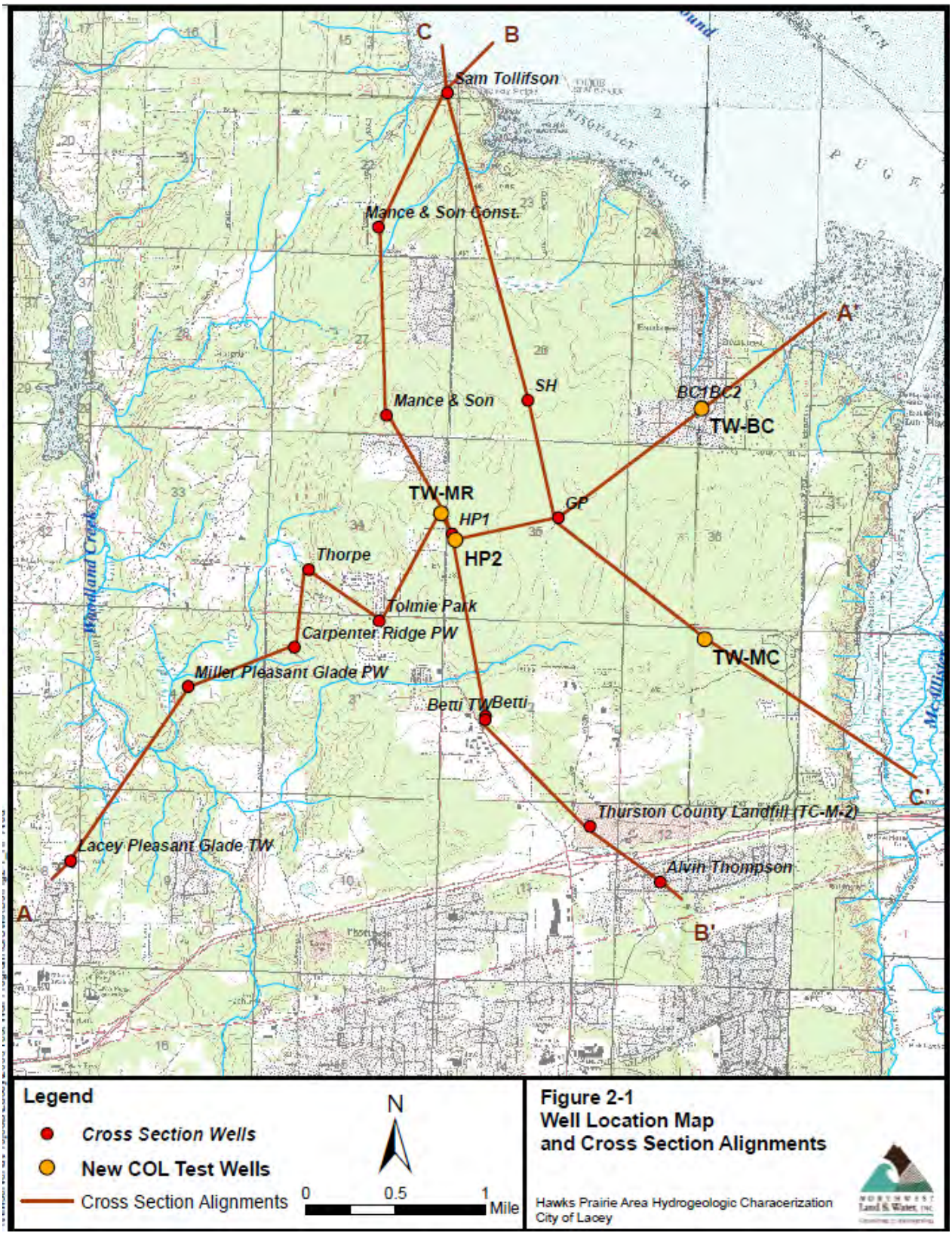

Figure A-6. Cross-section location maps, Hawks Prairie area. (Source: NWLW, 2008)

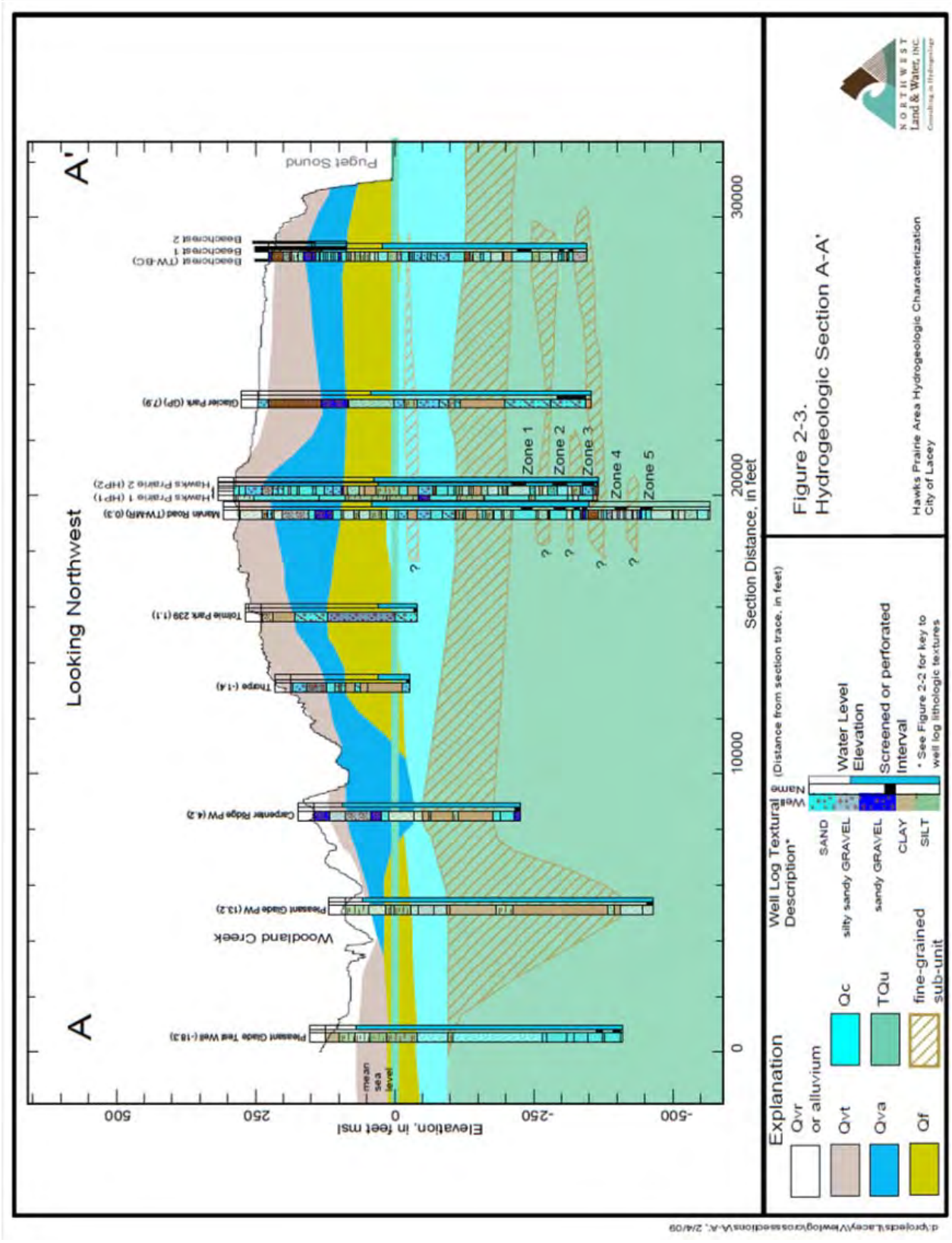

Figure A-7. Hydrogeologic cross-section A-A'. (Source: Northwest Land and Water, 2008)

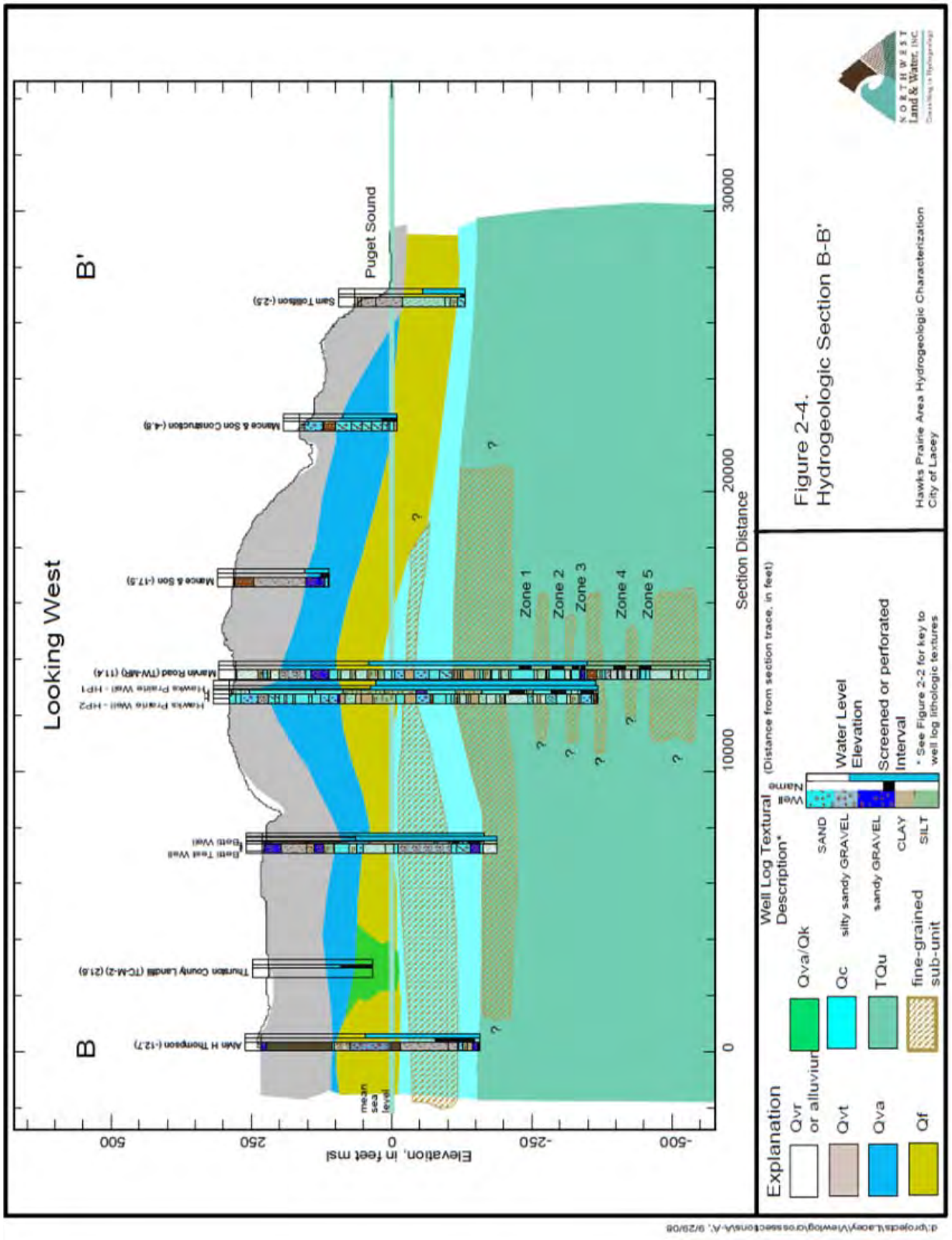

Figure A-8. Hydrogeologic cross-section B-B'. (Source: Northwest Land and Water, 2008)

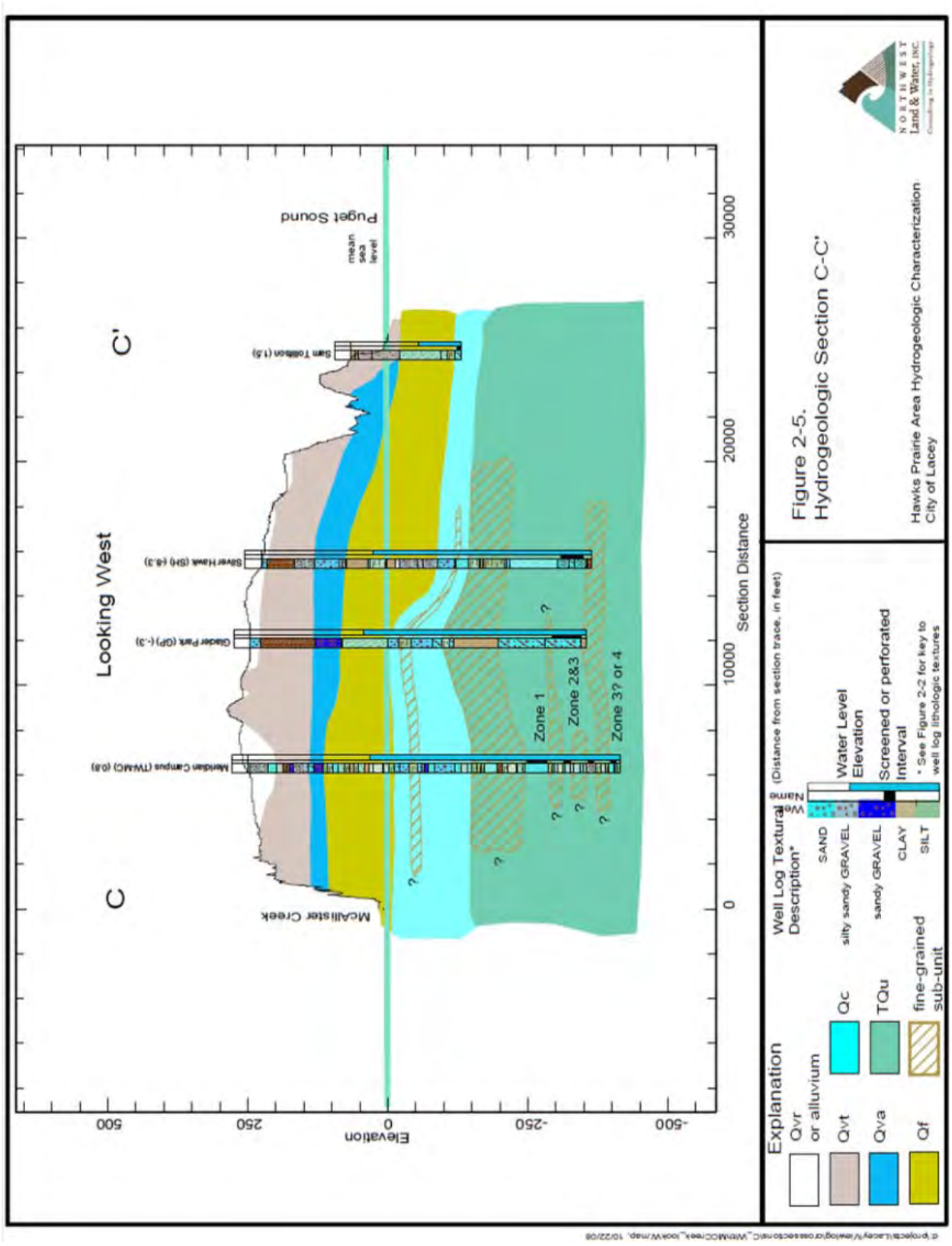

Figure A-9. Hydrogeologic cross-section C-C'. (Source: Northwest Land and Water, 2008)

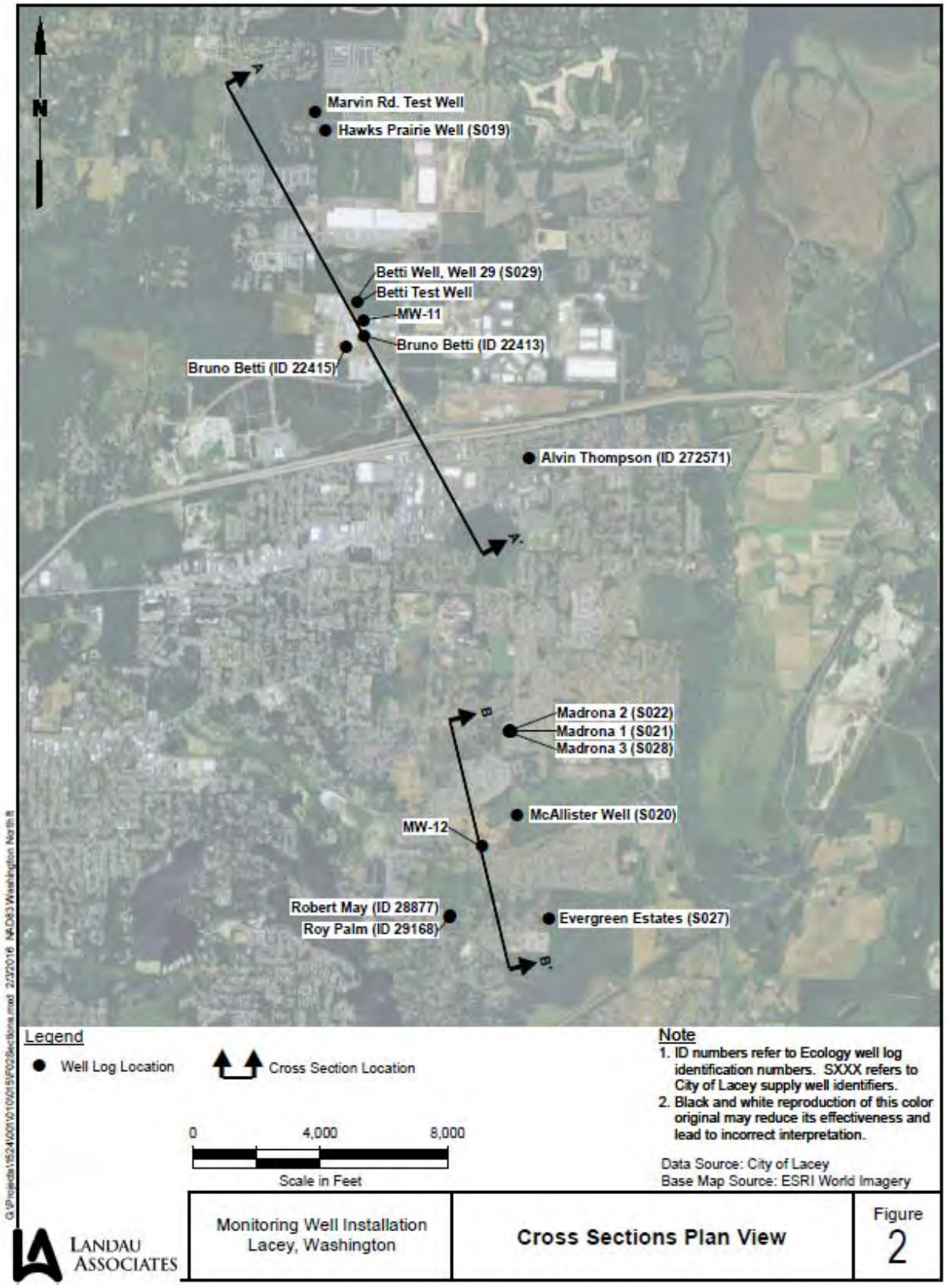

Figure A-10. Cross-section map, east of LOTT Hawks Prairie facility. (Source: Landau, 2016)

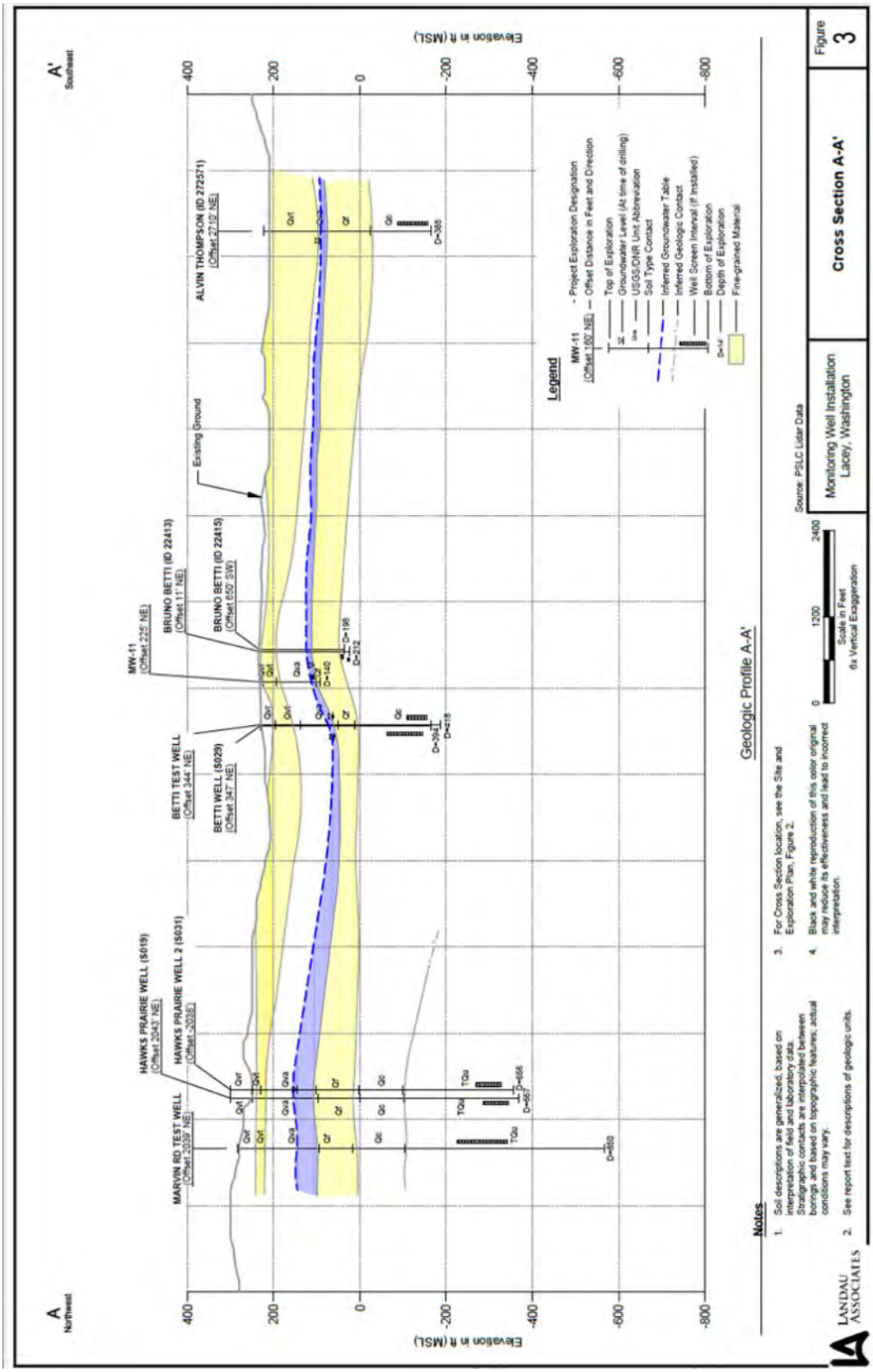

Figure A-11. Cross-section A-A'. (Source: Landau, 2016)

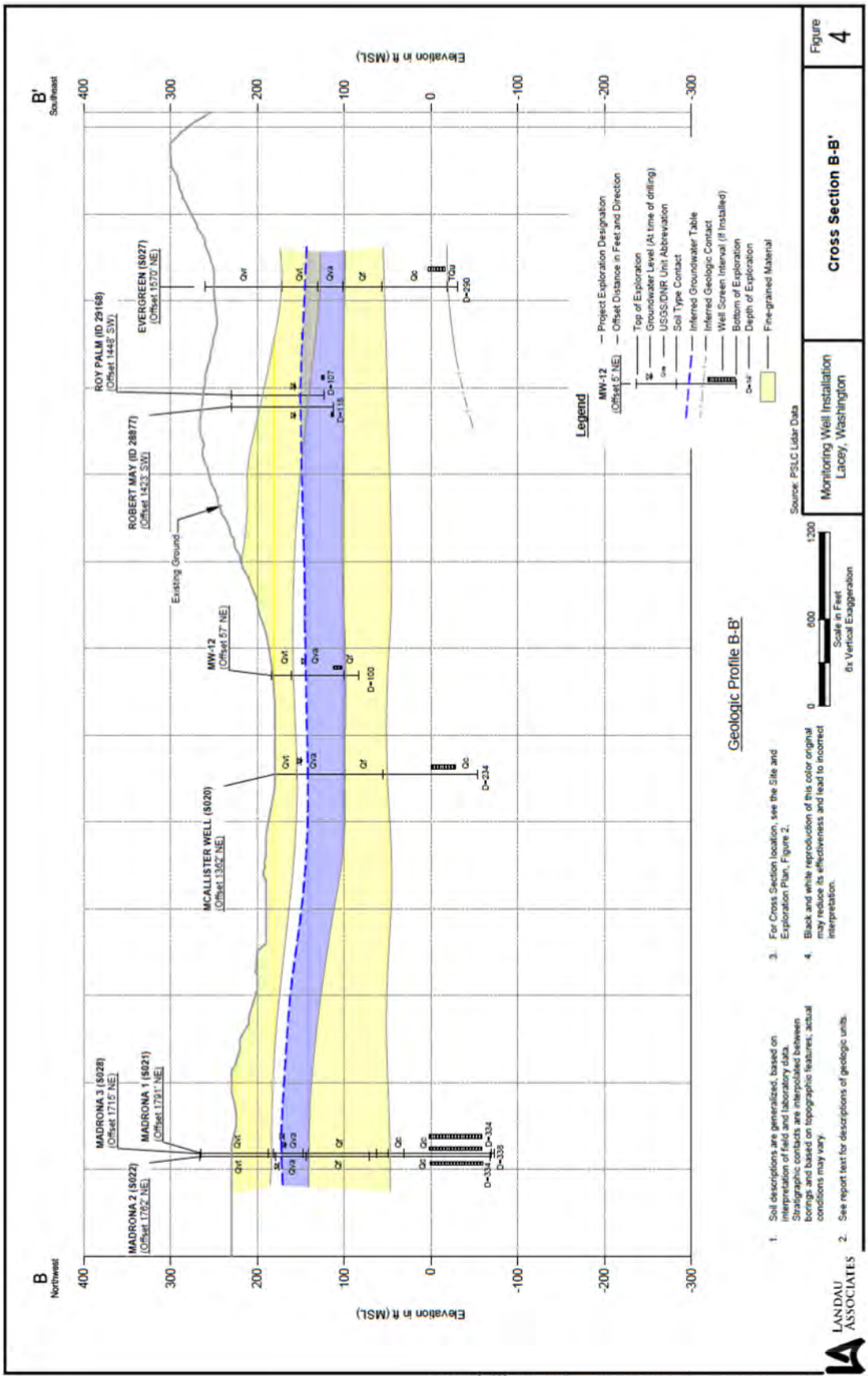

Figure A-12. Cross-section B-B'. (Source: Landau, 2016)

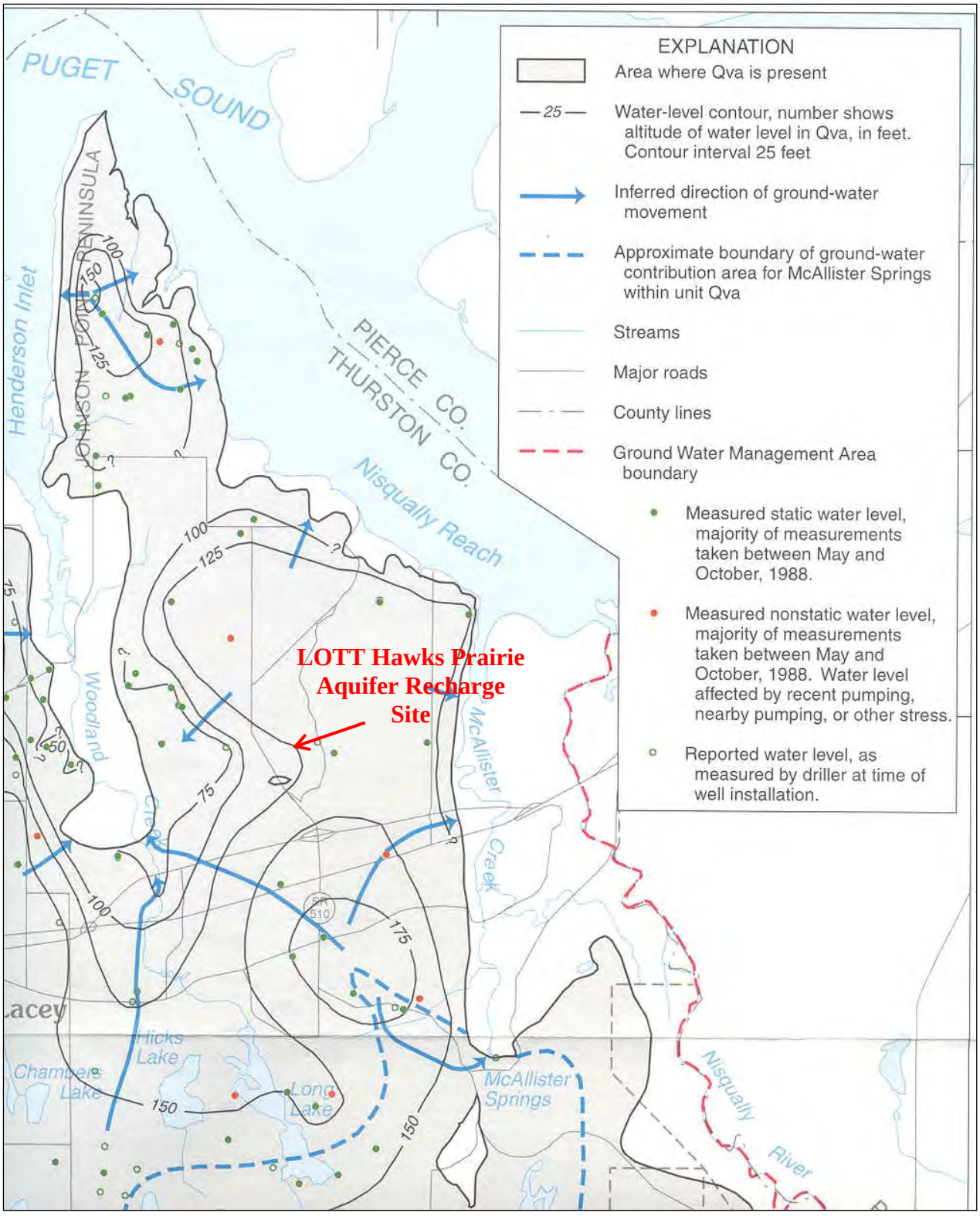

Figure A-13. Groundwater Elevation and Flow Path, Upper Aquifer, Hawks Prairie Area. (Source: Drost, 1999)

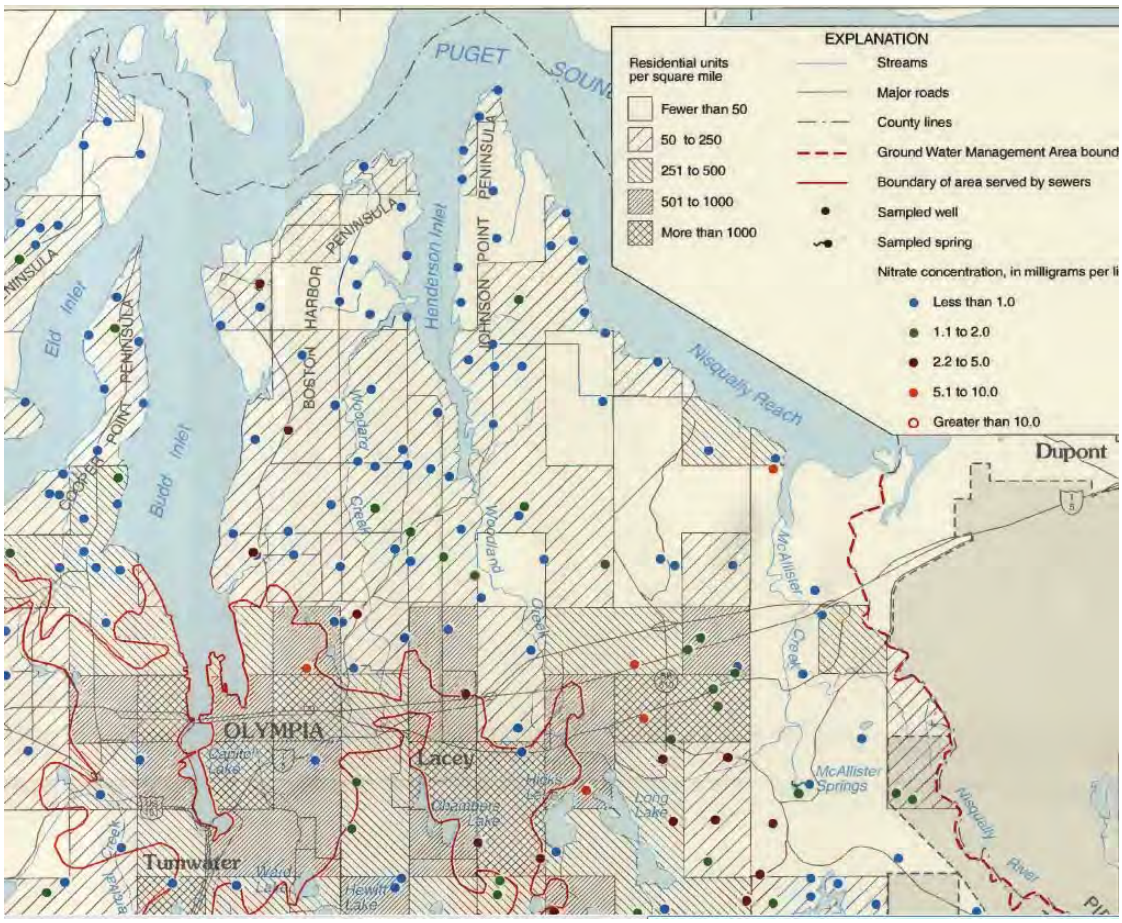

Table 5. Summary of concentrations of common constituents

[Concentrations in milligrams per liter unless otherwise noted. All are dissolved concentrations. Statistics are for samples from 359 wells and springs unless noted; µS/cm, microsiemens per centimeter at 25°Celsius; <, not detected at the given concentration; µg/L, micrograms per liter]

Constituent	Concentrations		
	Minimum	Median	Maximum
pH (standard units)	6.0	7.1	9.9
Dissolved oxygen[1]	.0	3.9	12.6
Specific conductance (µs/cm)	32	142	2,100
Hardness (as $CaCO_3$)	1.0	54	600
Calcium	.13	11	170
Magnesium	.01	5.8	55
Sodium	2.0	6.5	260
Percent sodium	10	20	99
Potassium	.1	1.6	11
Alkalinity (as $CaCO_3$)	7.0	56	464
Sulfate	<1.0	4.0	52
Chloride	1.3	3.4	600
Fluoride	<.1	.1	.4
Silica	5.7	35	66
Dissolved solids (calculated)	28	112	1,140
Nitrate (as nitrogen)	<.10	.33	19
Phosphorus	<.01	.04	1.6
Iron (µg/L)	<3	23	21,000
Manganese (µg/L)	<1	5	3,400

[1]Statistics based on 357 samples.

Figure A-14. Ground water quality data from 1988 sampling by USGS. Nitrate in groundwater in the Hawks Prairie area (top) and ground water quality of all Thurston County (bottom). (Source: Drost et al, 1998)

Figure 2 - North County Ambient Monitoring Network Well Locations

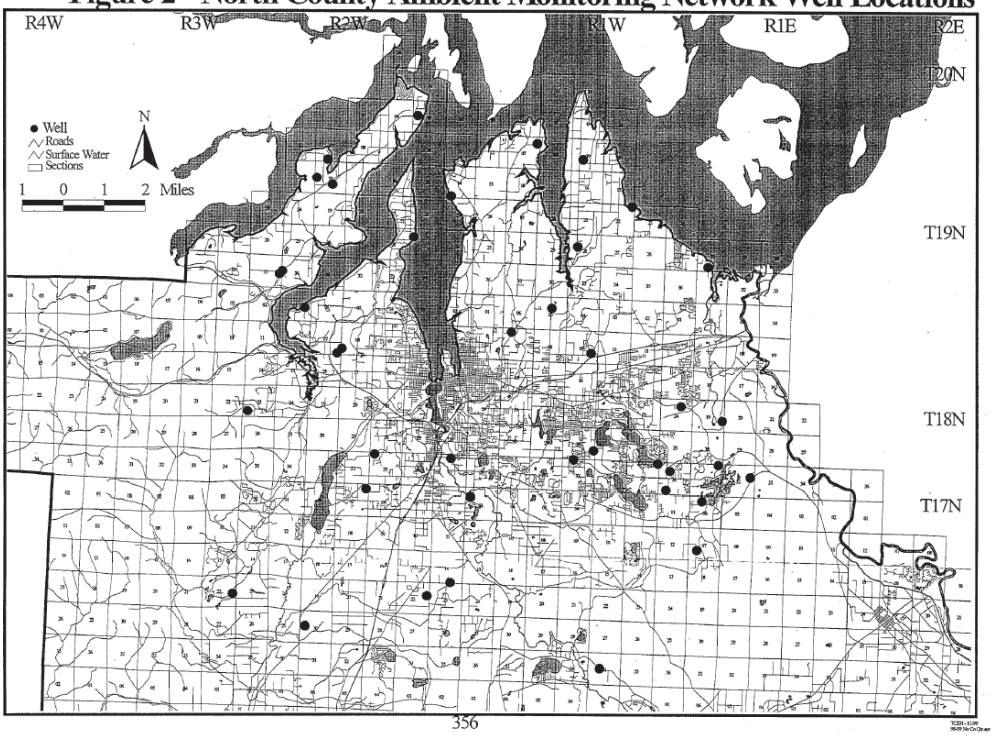

Table 4
Monitoring Parameter Data Summary
1996-97 (*in italics*) and 1997-98 Minimum, Maximum and Average Values
North County Ambient Monitoring Network

Aquifer		Number of Wells Sampled	pH*	Specific Conductance (µmhos/cm @ 25 °C)	Temperature (°C)	Dissolved Oxygen (mg/L)	Nitrate+Nitrite (mg N/L)	Total Iron† (mg/L)	Total Manganese† (mg/L)
Vashon recessional outwash **Qvr**	Min	*2* / 2	*6.1* / 5.9	*125* / 122	*10.5* / 10.5	*2.9* / 3.1	*2.44* / 1.87	<0.1	0.005
	Max		*7.0* / 6.8	*142* / 138	*10.6* / 11.0	*6.9* / 5.5	*2.52* / 3.00	<0.1	0.088
	Avg		*6.6* / 6.7	*134* / 130	*10.5* / 10.8	*4.9* / 4.1	*2.48* / 2.25	<0.1	0.058
Vashon advance outwash **Qva**	Min	*13* / 16	*6.0* / 5.8	*91* / 81	*9.5* / 9.4	*0.1* / 0.1	*0.02* / <0.01	<0.1	<0.01
	Max		*7.6* / 7.6	*341* / 305	*11.6* / 12.0	*10.5* / 15.6	*4.95* / 4.21	0.990	0.130
	Avg		*6.8* / 6.5	*163* / 145	*10.7* / 10.7	*5.4* / 6.2	*2.31* / 1.79	0.225	0.024
Kitsap Formation **Qf**	Min	*2* / 2	*6.4* / 6.2	*127* / 113	*9.9* / 9.7	*6.8* / 5.4	*1.43* / 1.09	<0.1	<0.01
	Max		*6.9* / 6.7	*178* / 170	*10.8* / 10.7	*8.9* / 8.2	*2.47* / 1.47	0.340	<0.01
	Avg		*6.7* / 6.6	*152* / 142	*10.3* / 10.2	*7.8* / 7.2	*1.95* / 1.29	0.152	<0.01
Penultimate deposits **Qc**	Min	*7* / 12	*6.5* / 6.2	*130* / 123	*9.6* / 9.3	*0.1* / 0.1	*0.02* / <0.01	<0.1	<0.01
	Max		*8.0* / 8.0	*327* / 359	*11.3* / 11.7	*7.8* / 10.8	*1.97* / 1.65	3.900	0.870
	Avg		*7.1* / 6.9	*189* / 209	*10.3* / 10.4	*1.8* / 1.8	*0.4* / 0.27	0.487	0.162
Undiff. deposits **TQu**	Min	*2* / 2	*7.9* / 7.6	*158* / 140	*10.2* / 10.0	*0.1* / 0.1	*0.02* / <0.01	0.100	0.029
	Max		*8.2* / 8.0	*214* / 206	*11.4* / 11.2	*0.1* / 0.2	*0.02* / 0.17	0.330	0.160
	Avg		*8.0* / 7.8	*186* / 172	*10.8* / 10.6	*0.1* / 0.1	*0.02* / 0.05	0.200	0.095
Bedrock **Tb**	Min	*3* / 3	*6.8* / 5.8	*154* / 140	*8.2* / 8.5	*0.1* / 0.1	0.02 / <0.01	<0.1	<0.01
	Max		*9.2* / 9.1	*822* / 600	*10.5* / 10.6	*3.0* / 4.4	0.16 / 0.64	<0.1	0.024
	Avg		*8.9* / 8.8	*383* / 243	*9.5* / 9.7	*1.1* / 1.0	0.06 / 0.16	<0.1	0.092

* pH average values were calculated as medians.
† Iron and manganese samples were not taken in 1996-97.

Figure A-15. Groundwater quality data from 1996 to 1998 for North Thurston County. (Source: Thurston County, 1999)

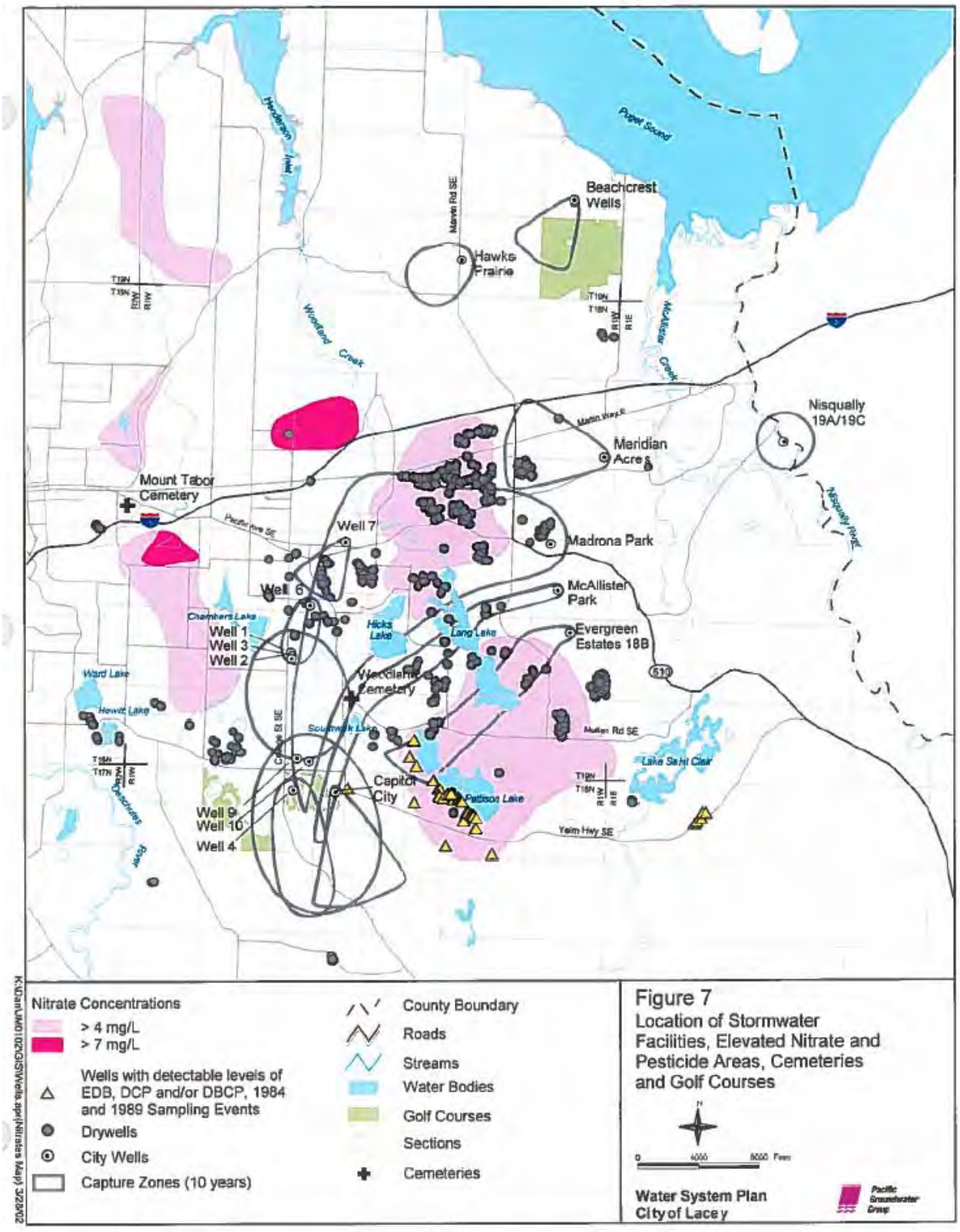

Figure A-16. Groundwater quality data from late 1990s showing nitrate concentrations in Woodland Creek drainage. (Source: PGG, 2002)

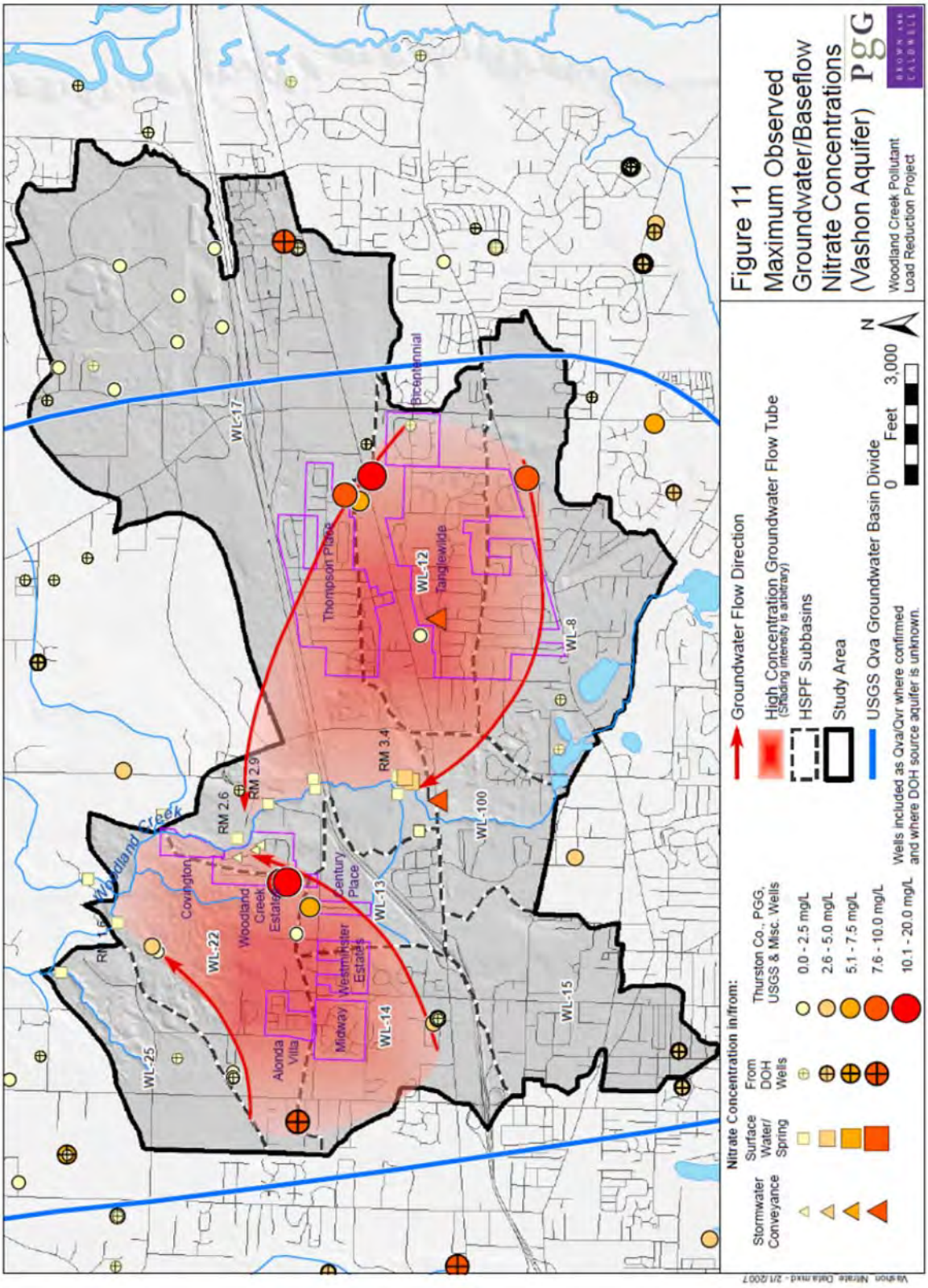

Figure A-17. Nitrate concentrations in ground water samples in Woodland Creek area. (Source: PGG, 2007)

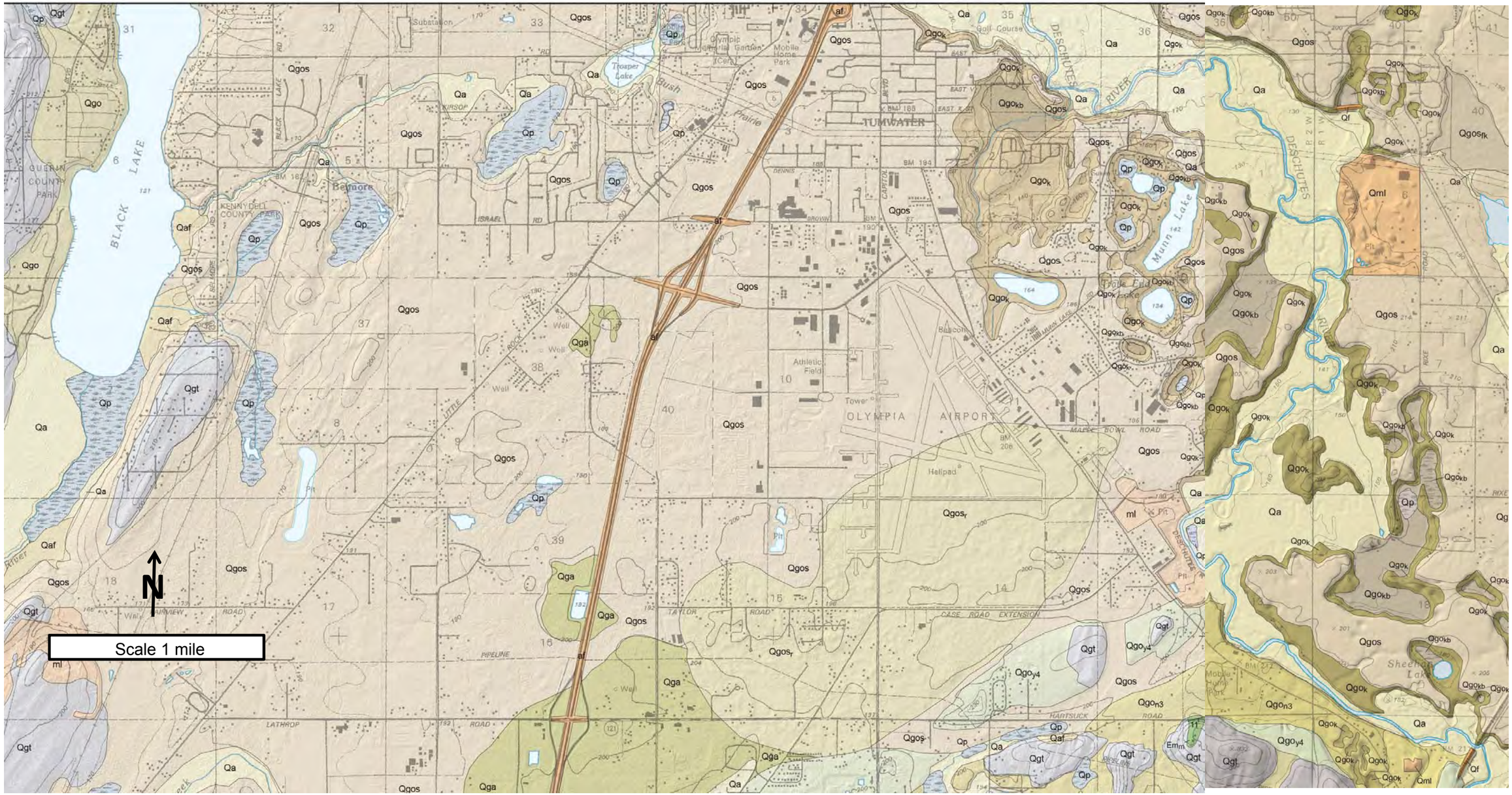

Figure A-18. Surface geology of the Tumwater study area. (Source: Logan et al, 2003; Walsh and Logan, 2005)

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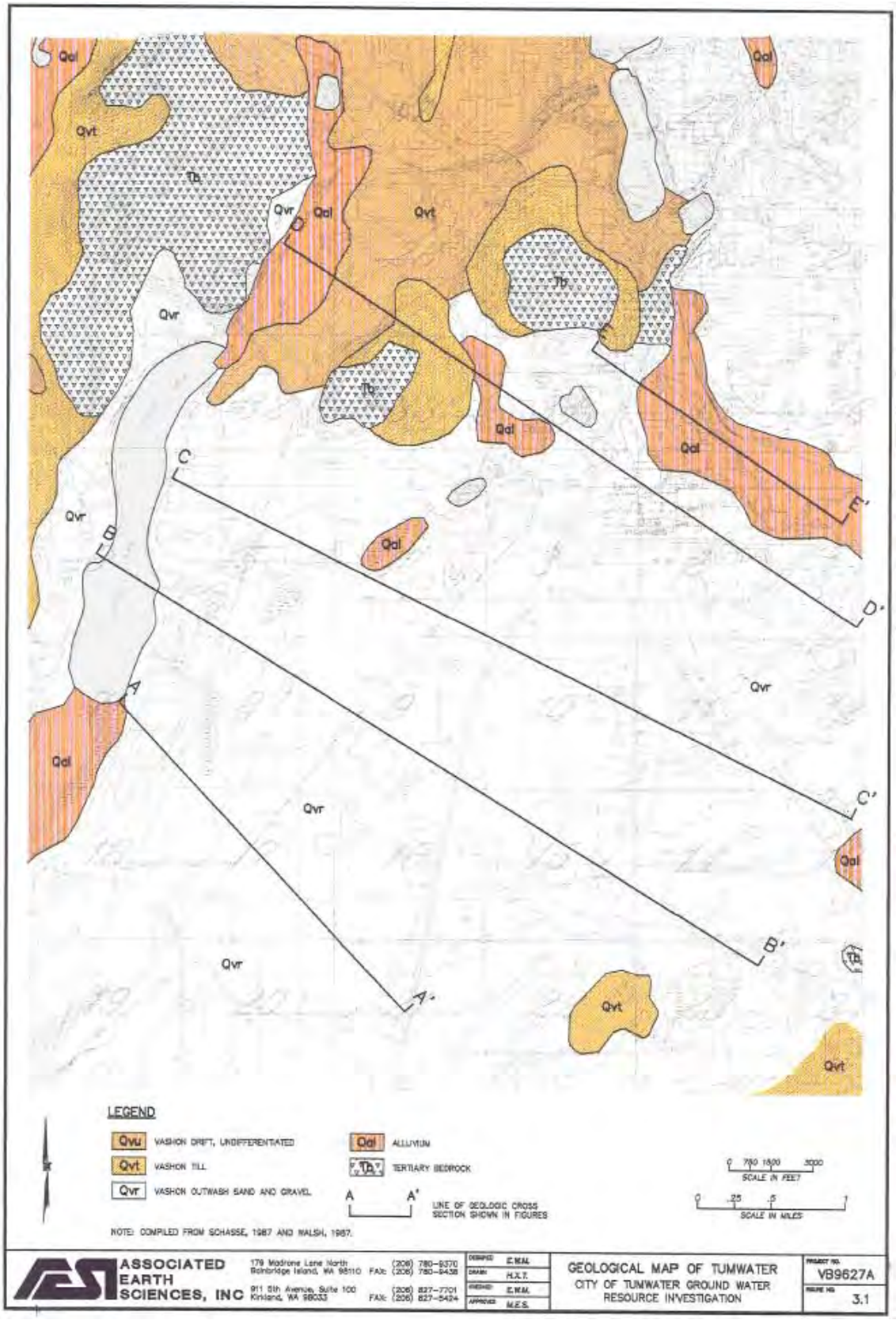

Figure A-19. Tumwater area cross-section location map. (Source: AESI, 1997)

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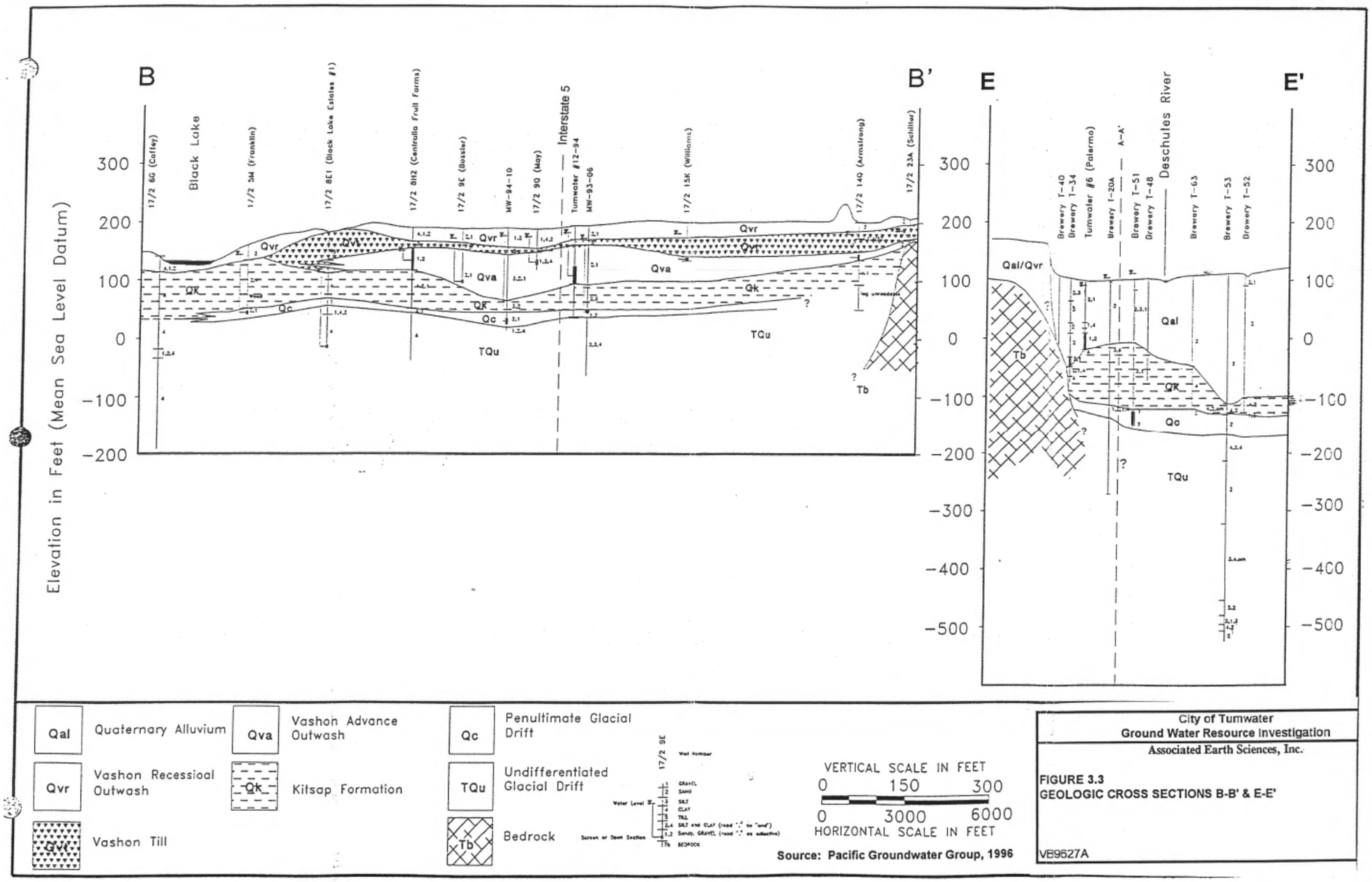

Figure A-20. Cross-sections B-B’ and E-E’ for Tumwater study area. (Source: AESI, 1997)

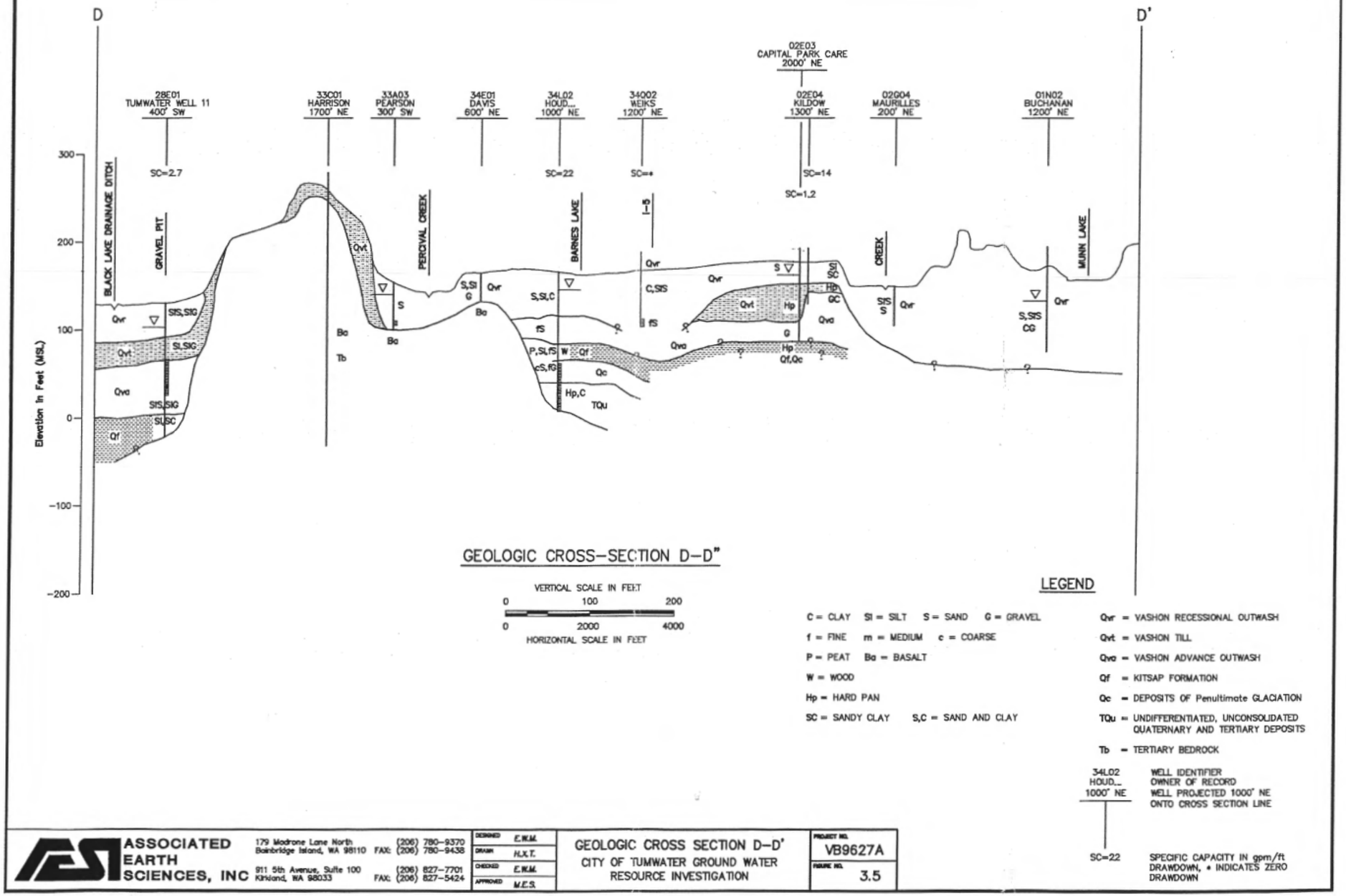

Figure A-21. Cross-sections D-D' for Tumwater study area. (Source: AESI, 1997)

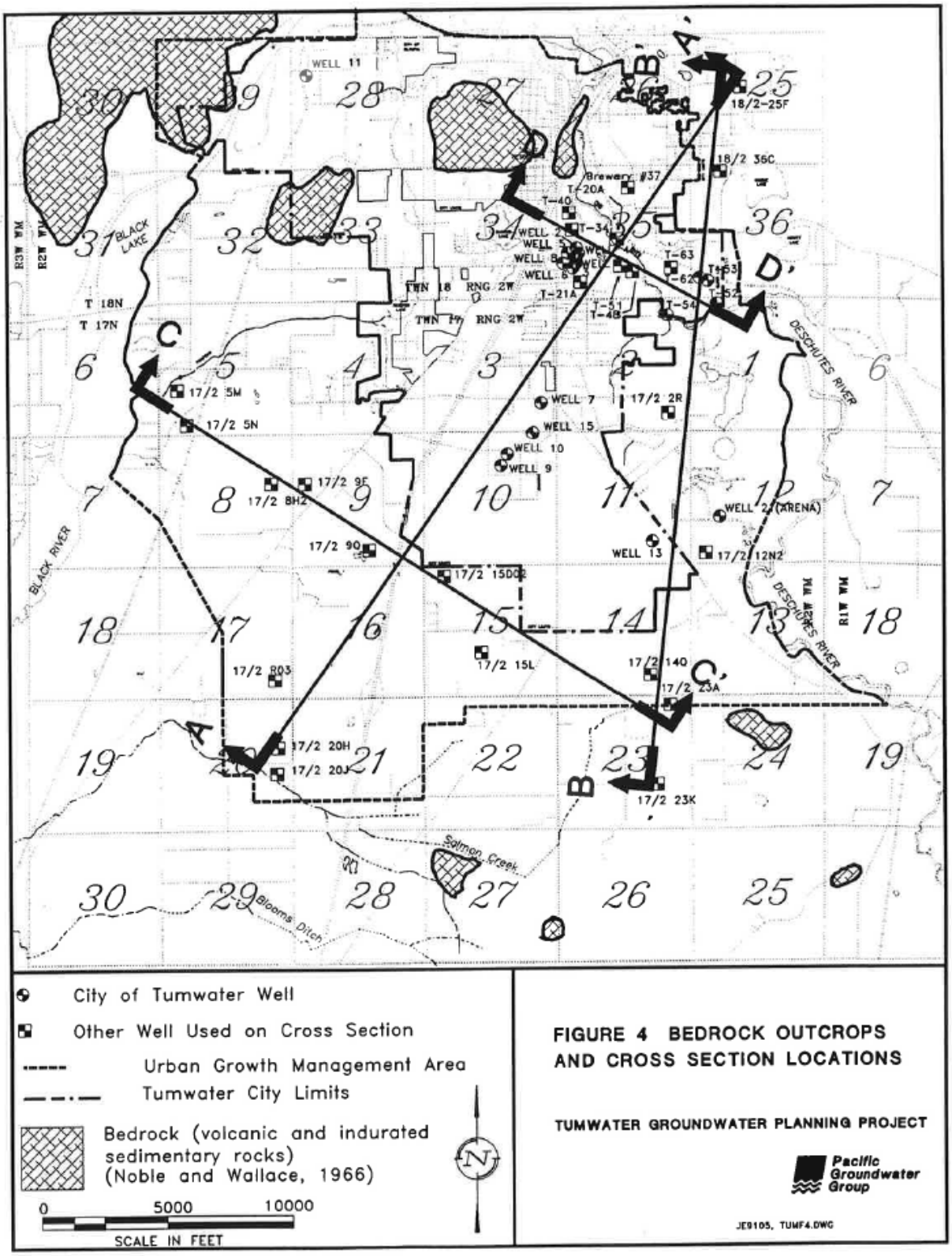

Figure A-22. Tumwater area cross-section location map. (Source: PGG, 1992)

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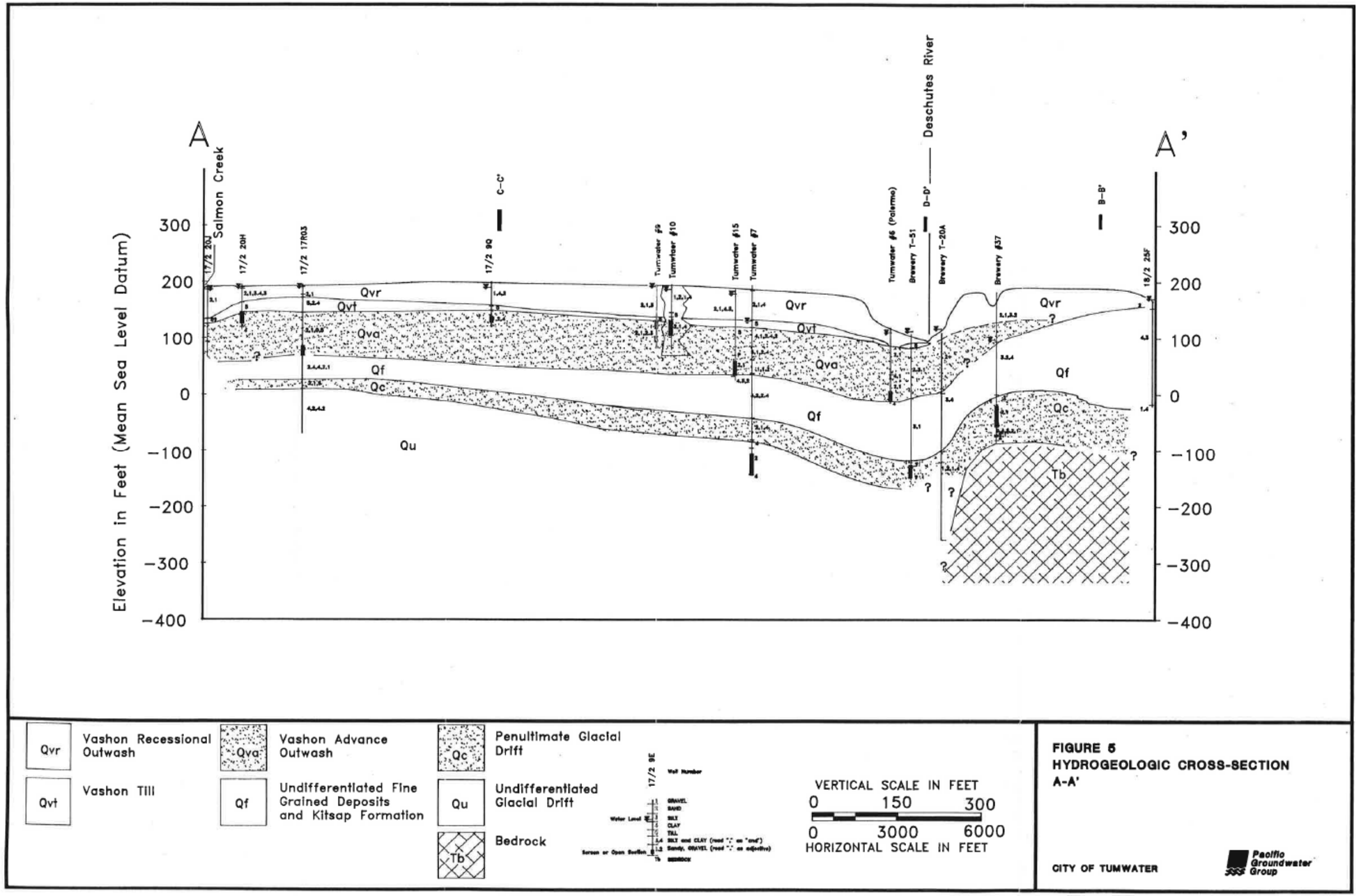

Figure A-23. Cross-sections A-A' for Tumwater study area. (Source: PGG, 1992)

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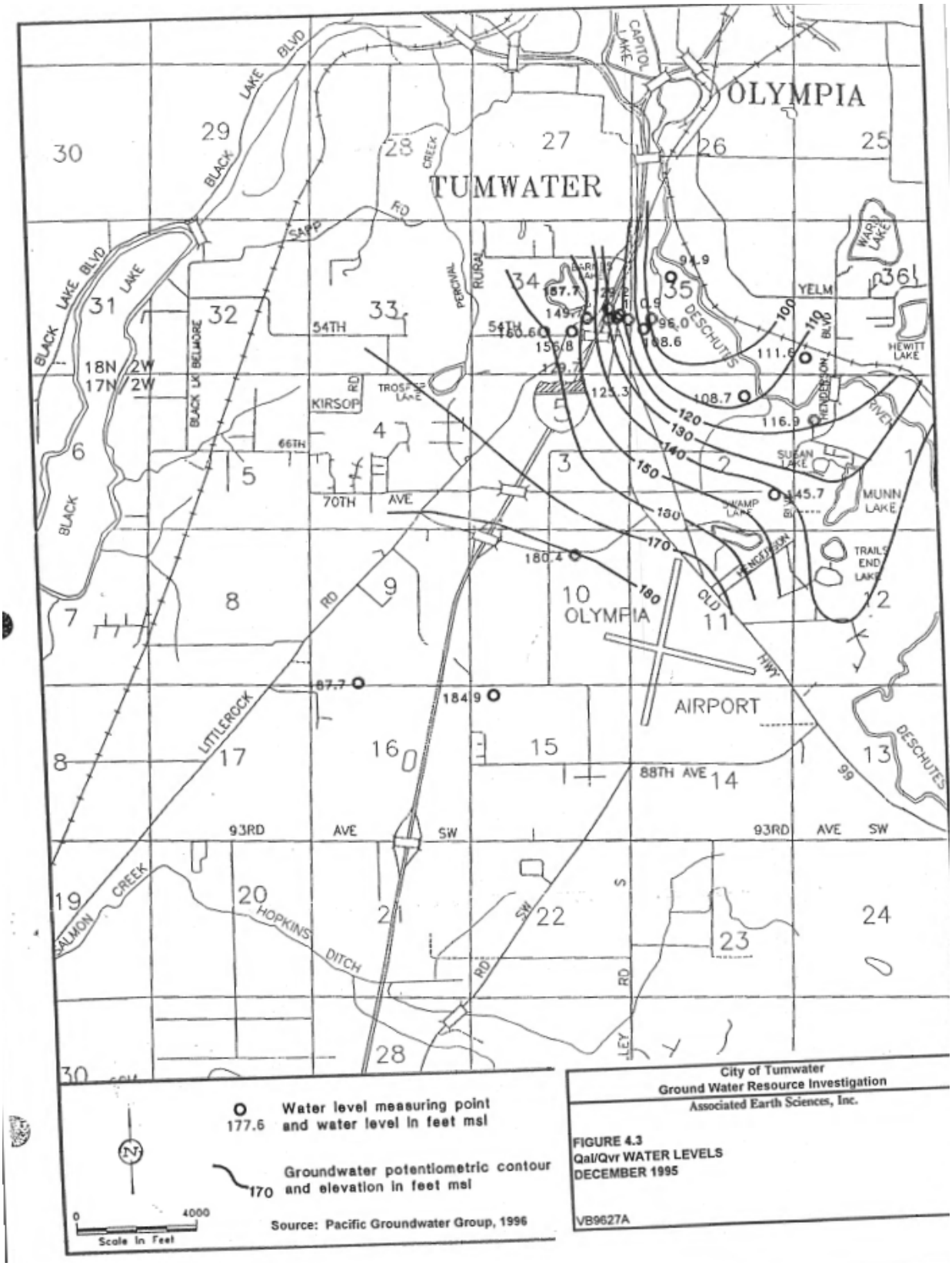

Figure A-24. Ground water potentiometric surface in the Shallow (Qvr) Aquifer. (Source: AESI, 1997).

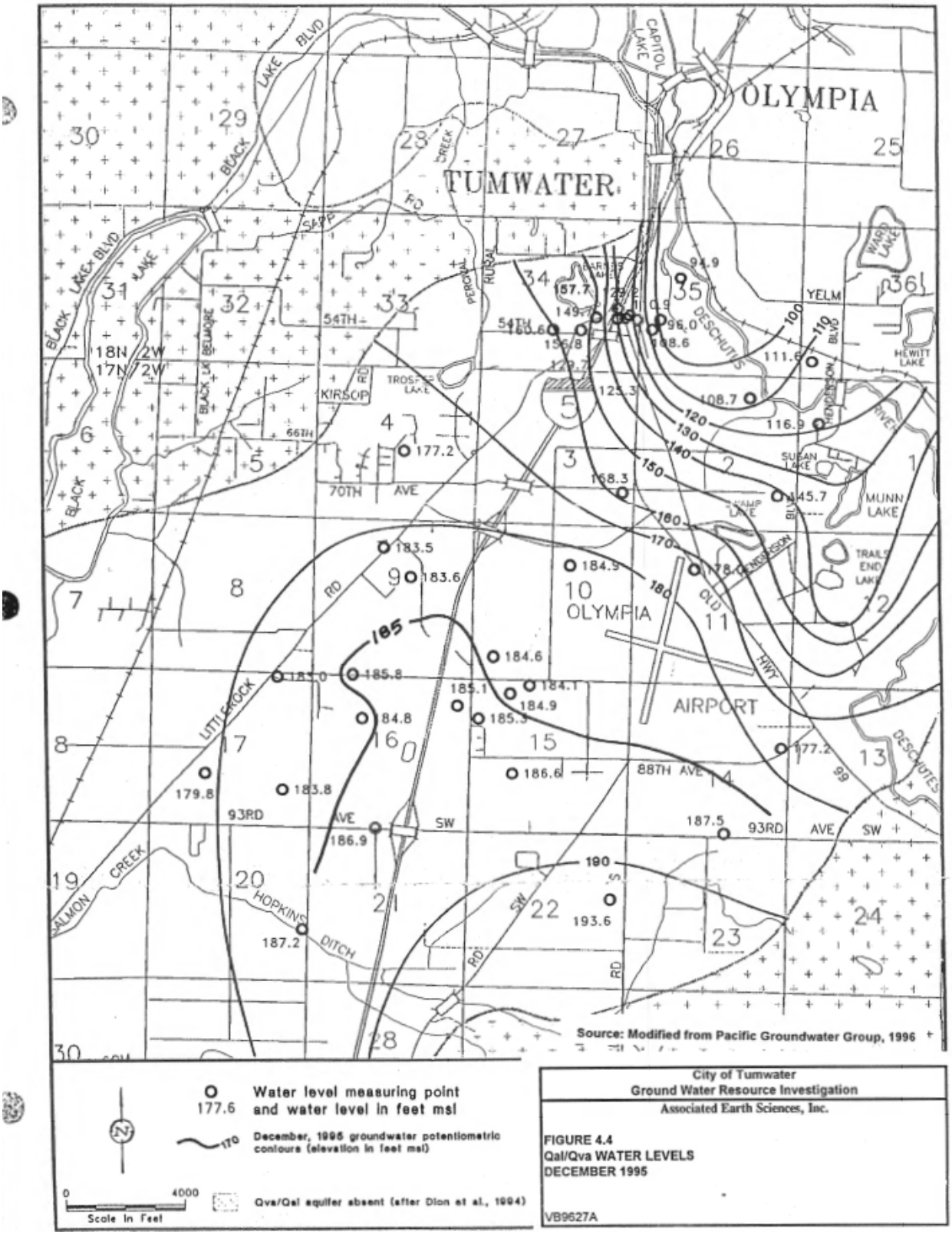

Figure A-25. Ground water potentiometric surface in the Shallow (Qva) Aquifer. (Source: AESI, 1997).

Appendix B
Well Location and Groundwater Level Data

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Table B-1. Wells used for groundwater quality and water level monitoring in the Hawks Prairie Study Area.

Study ID	Well Name	Well Location (lat/long.)		Well Depth (ft)	Top Screen (ft)	Bottom Screen (ft)	Completion Aquifer
		X Coordinate	Y Coordinate				
Residential Shallow Wells							
70	--	1065374.608	639488.327	93	89	93	Shallow Aquifer (Qva)
226	--	1066989.112	648262.179	145	135	145	Shallow Aquifer (Qva)
667	--	1066867.477	646779.044	80	75	80	Shallow Aquifer (Qva)
782	--	1068119.037	644980.123	73	69	73	Shallow Aquifer (Qva)
962	--	1062074.290	645713.935	47	37	47	Shallow Aquifer (Qva)
963	--	1062770.022	644453.822	89	84	88	Shallow Aquifer (Qva)
972	--	1062587.946	642343.069	119	114	119	Shallow Aquifer (Qva)
983	--	1062894.394	642178.431	90	86	90	Shallow Aquifer (Qva)
1082	--	1085409.996	652624.678	98	93	98	Shallow Aquifer (Qva)
1160	--	1064143.176	654283.807	76	66	76	Shallow Aquifer (Qva)
179	--	1067452.897	646921.010	105	--	--	Shallow Aquifer (Qva)
12	--	1070935.467	647515.831	120	--	--	Shallow Aquifer (Qva)
937	--	1083748.907	648597.874	130	126	130	Shallow Aquifer (Qva)
Public Supply Shallow Wells							
24	Foxhall	1065837.194	648628.927	163	154	163	Shallow Aquifer (Qva)
210	Woodland Creek	NA	NA	83	73	85	Shallow Aquifer (Qva)
196	Forest Park	1068853.535	651639.103	158	145	158	Shallow Aquifer (Qva)
1215	Foxhall	1068115.326	652559.844	133	133	143	Shallow Aquifer (Qva)
1217	Lacey S16	1079839.369	652404.692	140	115	140	Shallow Aquifer (Qva)
1224	Hogum Bay	1077301.123	644064.140	139	--	--	Shallow Aquifer (Qva)
722	Eagle Estates	1069717.637	644272.334	153	141.75	153.75	Shallow Aquifer (Qva)
MW-15	Thrston Co. Lndfl	1079401.321	642174.431	127			Shallow Aquifer (Qva)
Public Supply Deep Wells							
237	Lacey S29	1073526.896	643391.838	390	294	394	Sea Level (Qc)
535	Lacey S31	1072669.717	648567.506	656	585	643	Deep Aquifer (Tqu)
882	Thompson	1082947.436	641528.561	258	253	258	Sea Level (Qc)
1075	Lacey S22	1078299.704	629883.412	333	265; 294; 313	282; 306; 326	Sea Level (Qc)
1216	Lacey S07	1064829.907	630019.961	550	--	--	Deep Aquifer (Tqu)

Notes:
NA - Not Accessible

Table B-2. Groundwater levels measured in Shallow (Qva/Qvr) Aquifer wells in the Hawks Prairie Study Area.

Study ID	Well Name	Owner	Depth to Water (ft btoc)	Top of Casing Well Elev (ft, NAVD 88)	Vertical Precision (ft)	Groundwater Elevation (ft, NAVD 88)	Sampling Date
Private Drinking Water Wells							
963	--	--	44.22	77.91	2.90	34.07	4/23/2015
1082	--	--	61.90	64.56	0.40	2.11	4/23/2015
226	--	--	68.13	161.75	0.50	95.04	4/24/2015
13	--	--	No Access	254.75	0.50	No Access	4/24/2015
937	--	--	No Access	244.46	1.90	No Access	4/27/2015
1088	--	--	99.55	106.27	1.20	7.33	4/27/2015
980	--	--	37.48	86.54	1.40	50.06	4/28/2015
962	--	--	6.23	33.63	0.90	27.81	4/29/2015
1160	--	--	32.70	98.93	0.70	66.73	5/1/2015
70	--	--	6.94	78.98	1.10	72.92	5/1/2015
667	--	--	45.25	132.75	4.60	89.10	6/2/2015
782	--	--	34.75	104.86	0.50	71.11	4/30/2015
972	--	--	21.37	70.70	0.30	50.58	6/4/2015
179	--	--	No Access	150.30	0.70	No Access	5/12/2015
983	--	--	33.50	83.80	0.70	52.13	5/11/2015
Public Water Supply							
1224	--	Hogum Bay Water Association	98.47	251.34	1.60	152.87	7/1/2016
210	--	Woodland Creek Community Water	No Access	No Access	No Access	No Access	5/27/2015
196	Forest Park	Washington Water	115.60	268.76	0.30	154.66	5/7/2015
722	Eagle Estates	Washington Water	115.32	198.30	1.00	84.73	5/7/2015
24	Fox Hall	Wash. Water	79.00	164.48	0.80	87.06	5/7/2015
1215	Fox Hall	Wash. Water	94.00	252.13	0.60	159.86	5/7/2015
S15	Beachcrest 1	City of Lacey	77.58	235.66	0.01	158.08	5/6/2015
S16	Beachcrest 2	City of Lacey	80.07	238.82	0.01	158.75	5/6/2015

Study ID	Well Name	Owner	Depth to Water (ft btoc)	Top of Casing Well Elev (ft, NAVD 88)	Vertical Precision (ft)	Groundwater Elevation (ft, NAVD 88)	Sampling Date
Monitoring Wells and Surface Water Locations							
SRP-SAC	Salmon Lane Pond	West of Steilacoom Rd	Surface Water	22.50	1.20	22.50	6/4/2015
MW-1	MW-1	LOTT HP Facility	88.48	214.66	0.01	126.18	5/7/2015
MW-2	MW-2	LOTT HP Facility	86.26	219.07	0.01	132.81	5/7/2015
MW-3	MW-3	LOTT HP Facility	94.55	213.36	0.01	118.81	5/7/2015
MW-5	MW-5	LOTT HP Facility	94.16	217.30	0.01	123.14	5/7/2015
MW-6	MW-6	LOTT HP Facility	83.17	214.34	0.01	131.17	5/7/2015
MW-7	MW-7	LOTT HP Facility	85.93	214.44	0.01	128.51	5/7/2015
MW-8	MW-8	LOTT HP Facility	106.47	214.15	0.01	107.68	5/7/2015
MW-9	MW-9	LOTT HP Facility	95.56	214.10	0.01	118.54	5/7/2015
MW-10	MW-10	LOTT HP Facility	100.09	221.76	0.01	121.67	6/17/2015
MW-11	MW-11	LOTT HP Facility	144.38	224.89	0.01	80.51	5/7/2015
MW-1	MW-1	Thrstn Cty Lndfll	NP	NP	0.01	75.25	1/22/2015
MW-9S	MW-9S	Thrstn Cty Lndfll	NP	NP	0.01	115.54	1/20/2015
MW-11	MW-11	Thrstn Cty Lndfll	NP	NP	0.01	120.12	1/21/2015
MW-10S	MW-10S	Thrstn Cty Lndfll	NP	NP	0.01	122.54	1/20/2015
MW-12S	MW-12S	Thrstn Cty Lndfll	132.00	211.77	0.01	79.77	6/3/2015
MW-14	MW-14	Thrstn Cty Lndfll	NP	NP	0.01	123.35	1/21/2015
MW-15	MW-15	Thrstn Cty Lndfll	NP	NP	0.01	128.91	1/22/2015

Table B-3. Groundwater levels measured in Sea Level (Qc) Aquifer wells in the Hawks Prairie Study Area.

Study ID	Well Name	Municipality	Depth to Water (ft btoc)	Well Elev (ft, NAVD 88)	Vertical Precision (ft)	Groundwater Elevation (ft, NAVD 88)	Sampling Date
NS	S21	City of Lacey	225.17	264.90	0.01	39.73	5/6/2015
1075	S22	City of Lacey	226.48	266.07	0.01	39.59	5/6/2015
1076	S28	City of Lacey	225.78	265.35	0.01	39.57	5/6/2015
237	S29	City of Lacey	153.90	230.62	0.01	76.72	5/6/2015
882 (782)	Thompson	Wash. Water	218.65	234.99	1.20	17.34	5/7/2015
536	White Fir	Wash. Water	204.65	224.80	0.50	21.98	5/7/2015
27	Classic Heights	Wash. Water	223.70	239.30	0.70	17.60	5/7/2015
481	Fowler	Wash. Water	No Access	No Access	No Access	No Access	5/7/2015
NS	MW-9D	Thrstn Cty Lndfll	NP	NP	0.01	29.58	1/20/2015
NS	MW-6R	Thrstn Cty Lndfll	NP	NP	0.01	30.12	1/21/2015
NS	MW-13D	Thrstn Cty Lndfll	NP	NP	0.01	30.46	1/21/2015
NS	MW-10D	Thrstn Cty Lndfll	NP	NP	0.01	34.60	1/20/2015
NS	MW-12D	Thrstn Cty Lndfll	NP	NP	0.01	48.74	1/21/2015

Table B-4. Groundwater level data measured in Deep (TQu) Aquifer wells in the Hawks Prairie Study Area.

Study ID	Well Name	Municipality	Depth to Water (ft btoc)	Well Elev (ft, NAVD 88)	Groundwater Elevation (ft, NAVD 88)	Sampling Date
NS	S21	City of Lacey	225.17	264.90	39.73	5/6/2015
1075	S22	City of Lacey	226.48	266.07	39.59	5/6/2015
1076	S28	City of Lacey	225.78	265.35	39.57	5/6/2015
237	S29	City of Lacey	153.90	230.62	76.72	5/6/2015
882 (782)	Thompson	Wash. Water	218.65	234.99	17.34	5/7/2015
536	White Fir	Wash. Water	204.65	224.80	21.98	5/7/2015
27	Classic Heights	Wash. Water	223.70	239.30	17.60	5/7/2015
481	Fowler	Wash. Water	No Access	No Access	No Access	5/7/2015

Table B-5. Existing wells used for groundwater quality and water level monitoring in the Tumwater Study Area.

Study ID	Well Name	X Coordinate	Y Coordinate	Well Depth (ft)	Top Screen (ft)	Bottom Screen (ft)
Residential Wells						
11	--	972133.2978	1219588.07	77	72	76
30	--	963846.5681	1224059.014	115	109	114
58	--	963452.541	1224351.889	195	191	195
126	--	953096.0976	1224188.774	60	55	60
127	--	--	--	57	51	57
140	--	949949.9065	1224911.935	86	82	86
197	--	956352.6335	1224080.64	44		
202	--	--	--	41		
335	--	968646.2571	1210198.158	111		
403	--	955886.4418	1213737.425	59	55	59
425	--	954205.5493	1212954.26	77	73	77.5
484	--	--	--	40		
505	--	947767.208	1212417.38	40		
508	--	948760.6175	1212638.38	68	64	68
521	--	946741.6862	1214628.478	96		
522	--	943971.3278	1211244.632	80		
556	--	956400.4318	1209678.76	59		
622	--	948364.2524	1231520.815	60		
632	--	--	--	34	29	34
638	--	956241.535	1230823.617	41	36	41
Municipal Wells						
698	Tumwater # 4	1040658.294	617494.219	80		
704	Tumwater #10	1037835.39	609549.65	94	62	85
703	Tumwater #9	1037552.73	609000.69	96	57, 88	71, 96
264	Tumwater #12	1035418.18	605921.44	118	71,93	87100
734	WA Water - Monaco Park	963378.7787	1220611.832	86	76	86
9999	WA Water - Cloister	965957.9018	1220575.127	84.5	74.9	84.5
234	WA Water - Summer Hill	950423.9907	1220052.463	135		
736	WA Water - Israel Place	948958.5693	1222935.175	118		
708	Tumwater #15	1038776.970	610231.210	155		
107	Tumwater # 11	1039313.910	611512.460	154.5	109	117

Table B-6. Groundwater level data measured in Shallow (Qva/Qvr) Aquifer wells in the Tumwater Study Area.

Study ID	Well Name	Municipality	Depth to Water (ft btoc)	Well Elev (ft) (NAVD 88)	Vertical Precision (ft)	Groundwater Elevation (ft) (NAVD 88)	Date
Residential Wells							
11	--	--	40.10	209.48	0.30	170.46	8/28/2015
30	--	--	No Access	No Access	No Access	No Access	8/27/2015
58	--	--	97.60	175.11	0.40	78.85	8/31/2015
126	--	--	23.05	190.67	0.30	169.50	8/31/2015
127	--	--	No Access	No Access	No Access	No Access	9/1/2015
140	--	--	5.28	173.12	0.40	169.09	8/25/2015
197	--	--	18.55	186.87	0.50	169.32	8/26/2015
202	--	--	No Access	No Access	No Access	No Access	9/1/2015
335	--	--	51.53	217.87	0.30	167.84	9/3/2015
403	--	--	28.68	203.88	0.50	176.62	8/28/2015
425	--	--	21.90	196.84	0.70	176.65	8/26/2015
484	--	--	No Access	No Access	No Access	No Access	8/28/2015
505	--	--	26.75	196.13	0.40	171.61	8/25/2015
508	--	--	16.35	191.54	0.30	176.23	8/26/2015
521	--	--	14.88	187.44	0.40	173.72	8/27/2015
522	--	--	20.50	182.78	0.30	163.99	8/24/2015
556	--	--	19.05	202.90	0.50	183.85	8/24/2015
622	--	--	30.97	185.18	0.60	155.38	8/31/2015
632	--	--	No Access	No Access	No Access	No Access	8/27/2015
638	--	--	7.80	161.97	0.60	155.47	9/1/2015

Study ID	Well Name	Municipality	Depth to Water (ft btoc)	Well Elev (ft) (NAVD 88)	Vertical Precision (ft)	Groundwater Elevation (ft) (NAVD 88)	Date
Public Water Supply Wells							
698	Tumwater # 4	Tumwater	28.97	106.97	0.50	78.75	9/10/2015
704	Tumwater #10	Tumwater	No Access	No Access	No Access	No Access	9/10/2015
703	Tumwater #9	Tumwater	No Access	No Access	No Access	No Access	9/10/2015
264	Tumwater #12	Tumwater	No Access	No Access	No Access	No Access	9/10/2015
734	WA Water - Monaco Park	Wash Water	46.44	193.41	0.40	148.63	9/16/2015
	WA Water - Cloister	Wash Water	25.37	175.08	1.10	151.12	9/16/2015
234	WA Water - Summer Hill	Wash Water	25.82	199.01	0.40	175.02	9/16/2015
736	WA Water - Israel Place	Wash Water	24.08	194.83	0.30	171.58	9/16/2015
708	Tumwater #15	Tumwater	50.22	194.39	NA	144.17	9/10/2015
107	Tumwater # 11	Tumwater	No Access	No Access	No Access	No Access	9/10/2015

Appendix C
Results of Field Monitoring During Groundwater Sample Collection

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Table C-1. Field collected water quality parameters for the Hawks Prairie Study Area public water supply wells.

Field Parameters	Units	MW-15	MUN-24	MUN-1215	MUN-196	MUN-1224	MUN-722	MUN-1217	MUN-210	MUN-882	MUN-237	MUN-535A	MUN-1075	MUN-1216	Spring	Spring-DUP
		Thurston Cty Lndfl	Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Creek Water # 1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
Sample Date	Days	6/3/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/6/15	5/27/15	5/7/15	5/6/15	5/6/15	5/6/15	5/6/15	6/4/15	6/4/15
pH	Units	7.38	7.53	7.49	7.27	6.89	7.2	7.25	6.56	6.84	7.26	7.61	7.27	6.91	7.36	7.36
Temperature	^{0}C	11.5	10.8	11.1	10.7	10.3	11.8	10.9	10.7	10.9	10.9	10.9	11.1	10.5	13.2	13.2
Specific Conductance	µs/cm	92.9	154.8	219.1	247.3	158.7	255.1	308.7	308.6	387.2	348.7	113.9	207.4	230.7	142	142
ORP	mV	NA	121.4	134	136.1	169.2	148.2	121.8	95	170	118.1	-68.2	73.3	-51.7	131.5	131.5
Dissolved Oxygen	mg/L	NA	6.62	9.31	9.87	7.29	9.39	9.47	0.84	5.01	7.09	5.38	10.36	8.06	9.7	9.7

Table C-2. Field collected water quality parameters for the Hawks Prairie Study Area residential wells.

Field Parameters	Units	RES-12	RES-70	RES-179	RES-226	DOM-667	RES-782	RES-937	RES-962	RES-963	DOM-972	RES-983	RES-1082	RES-1160
Sample Date	Day	4/24/15	5/1/15	5/12/15	4/24/15	6/2/15	6/5/15	4/27/15	4/29/15	4/23/15	6/4/15	5/11/15	4/23/15	5/1/15
pH	Units	7.13	6.74	6.76	6.92	6.24	7.17	6.51	6.95	6.91	7.09	6.45	6.51	7.43
Temperature	^{0}C	10.4	11.6	12.5	10	11.4	10.1	10.6	10.7	11.8	14.5	11.3	11.8	10.9
Specific Conductance	µs/cm	189.8	290.8	262.3	159.2	233.4	152.2	228.9	225.2	281.3	196	266.5	1326	181.6
ORP	mV	89	86.1	119.3	68.5	137.6	127.3	181	145.3	65.8	118	78.1	44	-29.6
Dissolved Oxygen	mg/L	9.97	0.84	8.01	6.07	8.41	2.7	7.87	1.54	1.48	6.85	1.69	3.53	2.23

Table C-3. Field collected water quality parameters for Tumwater Study Area public supply wells.

Field Parameters	Units	MUNI-107	MUN-234	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-734	MUNI-9999
		City of Tumwater Well #11	WA Water Summer Hill	City of Tumwater Well #12	City of Tumwater Well #4	City of Tumwater Well #9	City of Tumwater Well #10	City of Tumwater Well #15	WA Water Monaco Park	WA Water the Cloister
Sampling Date	Day	9/10/15	9/16/15	9/10/15	9/10/15	9/10/15	9/10/15	9/10/15	9/16/15	9/16/15
Temperature	˚C	11.0	10.0	11.0	11.8	10.7	11.7	11.5	11.0	11.1
Specific Conductance	µS/cm	199.8	158.2	141.2	158.3	153.6	177.2	221.5	157.1	209.7
pH	units	7.31	7.38	7.21	7.08	7.25	7.33	7.02	7.04	7.05
Dissolved Oxygen	mg/L	3.17	7.80	6.47	8.37	6.99	5.45	3.78	7.64	6.35
ORP	mV	175.2	143.8	197.7	166.2	197.0	196.1	205.1	106.6	133.5

Table C-4. Field collected water quality parameters for Tumwater Study Area residential wells.

Field Parameters	Units	RES-11	RES-30	RES-58	RES-126	RES-127	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES-556	RES-622	RES-632	RES-638
Sampling Date		8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	8/25/15	8/29/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Temperature	˚C	12.7	15.2	12.0	20.0	11.5	13.9	12.4	11.9	13.6	13.0	13.6	17.0	12.3	11.4	12.0	13.2	11.9	13.4	15.0	12.1
Specific Conductance	µS/cm	166.1	150.1	104.5	170.4	217.8	177.1	131.0	96.2	144.0	142.7	122.6	105.4	148.6	152.9	135.4	155.3	151.5	207.4	209.8	271.2
pH	units	7.06	6.99	7.42	7.26	6.77	7.17	6.58	6.28	6.98	6.92	6.82	6.58	6.37	7.27	7.07	6.97	6.59	7.07	6.12	6.26
Dissolved Oxygen	mg/L	7.67	6.47	0.96	6.60	4.62	3.99	8.95	8.37	1.19	8.34	8.37	6.81	8.56	9.68	3.28	6.59	6.34	4.51	2.41	5.18
ORP	mV	210.3	123.7	4.6	203.1	206.4	-37.7	164.2	239.7	-35.2	204.1	92.4	235.2	255.3	126.1	163.7	185.1	218.4	17.7	192.6	206.9

Appendix D
Data Validation Reports

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DATA VALIDATION REPORT 1

LOTT Hawks Prairie Domestic and Public Wells Sampling Event

Laboratory: Eurofins Eaton Analytical

Laboratory Report Numbers: 536376, 537674, 533257, 533505, 526495, 534182, 535092, 533271, 537228, 531687, 532239, 531686, 533918, 531549, 532579, 537712, 531688, 531854, 526493, 532580, 537673, 537438, 588264, and 588277

Dates of Sampling: 4/23/2015, 4/24/2015, 4/27/2015, 4/29/2015, 5/1/2015, 5/6/2015, 5/7/2015, 5/11/2015, 5/12/2015, 5/18/2015, 5/27/2015, 6/2/2015, 6/3/2015, 6/4/2015, 6/5/2015, and 5/3/2016

INTRODUCTION

This report presents data validation for the 2015 Hawks Prairie Domestic and Public Wells groundwater sampling event for LOTT Clean Water Alliance (LOTT). These samples were collected in accordance with the procedures and protocols specified in the *Hawks Prairie Groundwater Recharge Project Low-Flow Groundwater Sampling Checklist* and the *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (EQASOP-GW-001). The laboratory data report and Quality Assurance and Quality Control (QA/QC) data are included in this data validation report.

Verification and validation steps addressed in this report are:

- Sampling Procedures and Chain of Custody
- Holding Times
- Detection Limit
- Minimum Reporting Level (MRL) Check
- Surrogate Spike Recoveries
- Laboratory Matrix Spike/Matrix Spike Duplicates (MS/MSD) Recoveries and Relative Percent Differences (RPD)
- Laboratory Control Sample (LCS) Recoveries
- Laboratory Method Blank
- Duplicate Field Sample

Data that do not satisfy some verification and validation steps are qualified. Qualifier definitions are as follows, unless otherwise noted in subsequent sections:

- J = Analyte is detected and the result is an estimate
- J- = Analyte is detected and the result is an estimate, biased low
- J+ = Analyte is detected and the result is an estimate, biased high
- UJ = Analyte is not detected and the result is an estimate

- R = Result is rejected

SAMPLING PROCEDURES and CHAIN OF CUSTODY

Samples were collected from domestic and public wells located throughout the Hawks Prairie Basin. Wells were purged utilizing the existing potable well pumps installed in each well. Purged water was monitoring for temperature, pH, electrical conductivity, and dissolved oxygen (DO). Purging continued until for a minimum of 15 minutes or until at least 3 well volumes of water had been removed. . Individual samples were batched separately by the laboratory.

Samples were labeled, sealed, placed in a cooler, and delivered to Eurofins Eaton Analytical in Monrovia, California.

Table D-1. Groundwater Laboratory Analytical Parameters for Samples Collected at Domestic and Public-Supply Wells

Parameter	Method	Hold Time	QC Conducted by Laboratory
Residual Chemicals	PPCP LC/MS/MS Method	28 days	LCS, Method Blank, MRL Check, MS/MSD
Nitrate, nitrite	EPA 300, 351.1, 351.2	48 hours	LCS, Method Blank, MRL Check, MS/MSD
Ammonia, TKN	EPA 350.1, 351.2	28 days	LCS, Method Blank, MRL Check, MS/MSD
Dissolved total phosphorus Dissolved orthophosphate	EPA 365.1/SM4500-P-E	28 days	LCS, Method Blank, MRL Check, MS/MSD
Fecal coliform	SM 9223	30 hours	None
Total organic carbon	SM 5310C	28 days	LCS, Method Blank, MRL Check, MS/MSD
Total sulfide	SM4500SD/376.2	7 days	LCS, Method Blank, MRL Check, MS/MSD
Chloride, Sulfate, Bromide	EPA 300.0	28 days	LCS, Method Blank, MRL Check, MS/MSD
Metals (Ag, Al, As, B, Be, Ca, Cd, Cr, Cu, Fe, Hg, Pb, Mg, Mn, Na, Pb, Ni, Se, Sb, Si, Tl, Zn)	EPA 200 series	180 days (28 days for Hg)	LCS, Method Blank, MRL Check, MS/MSD
Total dissolved solids	SM 2540C	7 days	Duplicate, LCS, Method Blank, MRL Check
Alkalinity/carbonate, hardness	SM 2320B, SM 2340B	14 days	LCS, Method Blank, MRL Check, MS/MSD
pH	SM4500-HB	Immediately upon receipt	Duplicate, LCS
Conductance	SM2510B	28 days	LCS, Method Blank, MRL Check
Metformin and Thiabendazole	LC-MS-MS	28 days	LCS, Method Blank, MRL Check, MS/MSD
SVOCs	EPA 525.2	30 days	LCS, Method Blank,

Parameter	Method	Hold Time	QC Conducted by Laboratory
			MRL Check, MS/MSD
VOCs	EPA 524.2	14 days	LCS, Method Blank, MRL Check, MS/MSD
PFOS/PFOA + Other PFCs	MWH PFC	28 days	LCS, Method Blank, MRL Check, MS/MSD
Pesticides	EPA 505	14 days (7 days for heptachlor)	LCS, Method Blank, MRL Check, MS/MSD
Herbicides	EPA 515.4	14 days	LCS, Method Blank, MRL Check, MS/MSD

A copy of the completed chain-of-custody (COC) forms is included in the Data Packages for all batches analyzed for the sampling event. The forms were properly filled out and include relinquished and received signatures. Shipments were received by the laboratory on the day following sampling. The cooler temperatures ranged from 2.2^{o} to 5.5^{o} C, and there was frozen wet ice present in each cooler.

HOLDING TIMES

The maximum holding times of groundwater for the various analyses are included in Table 1. Samples were extracted and analyzed within the holding times with the following exceptions:

- Samples analyzed for Method SM 9223 exceeded hold times for lab reports 536376, 537674, 533257, 533505, 526495, 534182, 535092, 533271, 537228, 532239, 533918, 532579, 537712, 531688, 531854, 532580, 537673, and 537438. Non-detect values were qualified as UJ. Samples with detections were qualified as J.
- Some of the residual chemical analytes analyzed using LC-MS-MS methods exceeded hold times for lab samples 535092, 526493, 532580, 533918, 537674, 536376, 532579, 531549, 531687, 531686, 531854, 534182, 537673, 537712, 532239, 537228, 537438, 531688, 533271, 533257, 533505, and 526495. A hold time study was conducted in 2016 to determine the effects of long hold times on the pharmaceuticals and personal care products (PPCPs) and perflourinated compounds (PFCs). A brief summary of that hold time study and its results is provided below.
- Several of the PFC analytes analyzed exceeded hold times for lab reports 535092, 531687, 531686, 531549, 531688, 526493, and 532580. However, as documented in the section below PFCs are very stable compounds and exceeding hold times was determined not to affect results. No flags were included.

Hold Time Study

The laboratory hold times for PPCPs and PFCs ranged from 28 to 70 days. Although EEA's laboratory method has no formalized hold times for these compounds, these hold times are longer than the 28 day analytical schedule EEA customarily utilizes for processing such samples.

To evaluate the effects of these extended hold times, EEA conducted a study to evaluate the effects of extending the hold times to 84 days for PPCPs. EEA also prepared information

documenting that PFCs are very stable. The methods and the detailed results of that study are presented in a summary memorandum by HDR dated November 9, 2016 and in EEA's report, "Holding Time Study Results for PPCPs and Metformin, LOTT Clean Water Alliance Project" dated November 4, 2016. Both documents are included as Attachment A.

The results of the hold time study indicate that 90 of the 98 compounds evaluated appear to remain stable throughout the 84 day period. Eight compounds appear to show evidence of degradation or analytical variability, as follows:

- Two compounds (metazachlor and metolachlor) began to degrade after approximately two weeks. Because all metazachlor and metolachlor samples were analyzed past a two week hold time, all of the results for these two parameters are assigned an "R" data quality flag, indicating the data are rejected. Note this impacts only the metazachlor data, as metolachlor was not analyzed for during the sampling efforts included in this data validation report (this compound was added to the laboratory's standard analytical list after the start of this effort).
- Four compounds (amoxicillin, azithromycin, cimetidine, and nonyl-phenol) show analytical variability on individual days and between days. Therefore, the results for these compounds should be considered semi quantitative (i.e., concentration results are estimates). "J" data quality flags are assigned for all of the results for these compounds (non-detects are assigned a "UJ" flag).
- Two compounds (nifedipine and theophyline) show concentrations consistently under or over the laboratory control sample (LCS) limits, but no evidence of inconsistent variability or degradation. This appears to be the result of a sample matrix effect or calibration artifact for this sample. "J" data quality flags are assigned for all of the results for these compounds (non-detects are assigned a "UJ" flag). Note Theophyline was not analyzed for in samples included in this data validation report (this compound was added to the laboratory's standard analytical list after the start of this effort).

DETECTION LIMIT

Minimum reporting limits (MRLs) are specified by the analytical methods. Analytes with results below the MRL are defined as "ND" (Not Detected). MRLs were less than applicable groundwater quality standards with the exception of analytes below.

Table D-2. Minimum Reporting Limits Exceeding Respective Water Quality Standards

Analyte	MRL	Units	Groundwater Quality Standard
Arsenic	1	ug/L	0.05
1,1,1-Trichloroethane	0.5	ug/L	0.2
Carbon tetrachloride	0.5	ug/L	0.3
Vinyl chloride	0.3	ug/L	0.02
Aldrin (EPA Method 525.2)	0.01	ug/L	0.005
Benzo(a)pyrene	0.02	ug/L	0.008
Dieldrin (EPA Method 525.2)	0.01	ug/L	0.005

MINIMUM REPORTING LIMIT (MRL) CHECK

A reporting level standard is included with every batch/analytical run to confirm the instrument response with the given batch. In instances where the method reporting level check was higher than QC limits, but the native sample was non-detect, no qualifications were. The following qualifications were made for data exceeding MRL recoveries QC limits:

Table D-7-1. MRL Checks Exceeding QC Limits

Lab Report Number	Sample ID	Analyte	Native Value	MRL_CHECK	QC Limits (%)	Qualifier
531687	RES1082	Silver Total ICAP/MS	**ND**	**-33.8 %**	**50-150**	**UJ**
531687	RES226					
531549	RES226					
588277	RES-983	Metribuzin	ND	160	50-150	UJ
		Aldrin	ND	38	50-150	UJ
		Acenaphthylene	ND	35	50-150	UJ
		Dimethoate	ND	132	50-150	UJ

SURROGATE SPIKE RECOVERIES

Surrogates are organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analysis. Surrogate spikes were added to each sample associated with EPA 515.4 - Chlorophenoxy Herbicides, EPA 505 - Organochlorine Pesticides/PCBs, EPA 525.2 - Semivolatiles by GCMS, and EPA 524.2 - Volatile Organics by GCMS. Recoveries were reviewed and evaluated for adherence to the control limits specified for the various analytical methods:

Table D-4. Surrogate Spike Recovery Control Limits

Surrogate Parameter	Control Limits (% recovery)
EPA 515.4 - Chlorophenoxy Herbicides	
2,4-Dichlorophenyl acetic acid	70-130
EPA 505 - Organochlorine Pesticides/PCBs	
Tetrachlorometaxylene	70-130
EPA 525.2 - Semivolatiles by GCMS	
1,3-Dimethyl-2-nitrobenzene	70-130
Perylene-d12	70-130
Triphenylphosphate	70-130
EPA 524.2 - Volatile Organics by GCMS	
1,2-Dichloroethane-d4	70-130
4-Bromofluorobenzene	70-130
Toluene-d8	70-130

For groundwater samples analyzed in this batch, surrogate recoveries were all within control limits.

LABORATORY MATRIX SPIKE/SPIKE DUPLICATES (MS/MSD) RECOVERIES and RELATIVE PERCENT DIFFERENCES (RPD)

To assess potential matrix effects, an environmental sample and a duplicate are spiked with known concentrations of target analytes. The percent recovery of the target analytes is compared to statistical control limits.

Analytes that failed both MS and MSD are qualified as estimated. Analytes that were not detected and that had MS/MSD recoveries below 10 percent were rejected. Analytes that failed on only the MS or the MSD are considered acceptable and the data are not qualified for these analytes. Sample concentrations that exceed the spike added concentrations by more than a factor of four are not flagged.

MS and MSD recoveries were all within the QC limits with the following exceptions noted below. In addition, in instances where the spike recovery is high, but the results is ND, there is no impact on the data since ND with high recovery is still ND. Samples spiked for MS/MSD from non-LOTT projects were not evaluated.

Table D-5. Laboratory Matrix Spikes and Spike Duplicates Exceeding QC Limits

Lab Report Number	Sample ID	Analyte	Native Value	MS % Yield	MSD % Yield	QC Limits (%)	Qualifier
533257	MUN1075	1,7-Dimethylxanthine	ND	0.549	0.4	60-140	R
533257	MUN1075	Acetaminophen	ND	54	49	60-140	UJ
533257	MUN1075	Azithromycin	ND	33	16	60-140	UJ
533257	MUN1075	Chloridazon	ND	13	10	60-140	UJ
533257	MUN1075	Chlorotoluron	ND	41	41	60-140	UJ
533257	MUN1075	Erythromycin	19	949	857	60-140	J+
533257	MUN1075	Lopressor	ND	45	38	60-140	UJ
533257	MUN1075	Metazachlor	ND	47	40	60-140	UJ
533257	MUN1075	Pentoxifylline	ND	36	38	60-140	UJ
533257	MUN1075	Sulfadiazine	ND	0.5	0.726	60-140	R
526495	MUN535A	Chloramphenicol	ND	47	52	60-140	UJ
537712	RES782	1,7-Dimethylxanthine	ND	2.4	2.4	60-140	R
537712	RES782	Caffeine	ND	11	16	60-140	UJ
537712	RES782	Carbadox	ND	21	21	60-140	UJ
537712	RES782	Chloridazon	ND	46	43	60-140	UJ
537712	RES782	Lidocaine	ND	34	34	60-140	UJ
537712	RES782	Lopressor	ND	33	36	60-140	UJ
537712	RES782	Sulfadiazine	ND	1.2	1.2	60-140	R
537712	RES782	Sulfamerazine	ND	37	40	60-140	UJ
537712	RES782	Sulfamethazine	ND	54	50	60-140	UJ
537712	RES782	Sulfamethoxazole	ND	59	54	60-140	UJ
537712	RES782	Sulfathiazole	ND	14	13	60-140	UJ
537712	RES782	Thiabendazole	ND	17	17	60-140	UJ
531688	RES937	Alrdin	ND	67	N/A	70-130	UJ
531688	RES937	Anthracene	ND	31	N/A	60-140	UJ
526493	RES963	1,7-Dimethylxanthine	ND	7.9	6.8	60-140	R
526493	RES963	Acetaminophen	ND	15	12	60-140	UJ
526493	RES963	Bezafibrate	ND	48	52	60-140	UJ
526493	RES963	Dilantin	ND	27	23	60-140	UJ
526493	RES963	Lidocaine	ND	43	39	60-140	UJ
526493	RES963	Metazachlor	ND	54	58	60-140	UJ
526493	RES963	Sulfadiazine	ND	3.6	3.5	60-140	R
526493	RES963	Sulfamerazine	ND	53	53	60-140	UJ
526493	RES963	Sulfathiazole	ND	41	37	60-140	UJ
526493	RES963	Thiabendazole	ND	29	28	60-140	UJ
588264	COL-D	Nifedipine	ND	36	38	60-140	UJ
588264	COL-D	Isoproturon	ND	42	40	60-140	UJ
588264	COL-D	Lidocaine	ND	35	32	60-140	UJ

Lab Report Number	Sample ID	Analyte	Native Value	MS % Yield	MSD % Yield	QC Limits (%)	Qualifier
588264	COL-D	Metazachlor	ND	55	53	60-140	UJ
588264	COL-D	Azithromycin	200	242	260	60-140	J
588264	COL-D	Bromacil	ND	46	58	60-140	UJ
588264	COL-D	Sulfadiazine	ND	3.3	3.6	60-140	R
588264	COL-D	Chloridazon	ND	35	40	60-140	UJ
588264	COL-D	Pentoxifylline	ND	48	53	60-140	UJ
588264	COL-D	Theophylline	ND	7.4	7.7	60-140	R
588264	COL-D	Carbadox	ND	58	51	60-140	UJ
588264	COL-D	1,7-Dimethylxanthine	ND	15	14	60-140	UJ
588264	COL-D	Dilantin	ND	23	17	60-140	UJ

The RPD for the MS/MSD were within acceptable laboratory tolerances.

LABORATORY CONTROL SAMPLE (LCS) RECOVERIES

Laboratory Control Samples (LCS) are samples of known concentration that are carried through the extraction and analysis process. The percent recovery is the percentage of the theoretical concentration, and has statistical control limits indicating that the analytical process is "in control."

An LCS sample was run in duplicate with the work order samples. LCS recoveries were all within the QC limits with the exceptions noted below. In addition, in instances where the LCS recovery is high, but the native result is ND, there is no impact on the data since ND with high recovery is still ND.

Table D-6. Laboratory Control Samples Exceeding QC Limits

Lab Report Number	Sample ID	Analyte	Native Value	LCS1 Yield %	LCS1 Yield %	QC Limits (%)	Qualifier
531687	RES1082	Aldrin	ND	52	55	70-130	UJ
532239	RES1160	Beryllium Total ICAP/MS	ND	81	81	85-115	UJ
532239	RES1160	Aldrin	ND	61	67	70-130	UJ
531686	RES12	Aldrin	ND	52	55	70-130	UJ
533918	RES179	Aldrin	ND	57	62	70-130	UJ
531549	RES226	Aldrin	ND	52	55	70-130	UJ
532579	RES70	Aldrin	ND	61	67	70-130	UJ
532579	RES70	Beryllium Total ICAP/MS	ND	81	81	85-115	UJ
531688	RES937	Aldrin	ND	56	65	70-130	UJ
531854	RES962	Aldrin	ND	63	65	70-130	UJ
526493	RES963	Aldrin	ND	52	55	70-130	UJ

LABORATORY METHOD BLANK

An aliquot of reagent water was carried through the entire analytical process. The method blank results indicate any possible contamination exposure during the sample handling, digestion, or extraction process and analysis. In most instances, compounds were not detected at or above the method reporting limits. For compounds that were detected at or above the reporting limit, the result of the native sample was either a non-detect or ten times greater than the method blank result. Therefore, no qualifications were made.

DUPLICATE FIELD SAMPLE

A duplicate sample was secured for SPR-SAC (Duplicate: SPR-DUP). The results of the duplicate are presented below. RPDs ranged from 0% to 48.48%. Generally, a RPD of less than 20 percent is desirable. Only Iron Total ICAP exceeded the 20% RPD.

Table D-7. Relative Percent Difference (RPD) for Duplicate Sample from SPR-SAC

Compound	SPR-SAC	SPR-DUP	RPD (%)
24 Hour E. Coli Confirmed	10	10	0.00%
24 Hour Total Coliform Confrm	10	10	0.00%
Acesulfame-K	87	76	13.50%
Alkalinity in CaCO3 units	43	43	0.00%
Barium Total ICAP/MS	3.2	3.1	3.17%
Bicarb.Alkalinity as HCO3calc	52	52	0.00%
Bromide	5.8	5.8	0.00%
Calcium Total ICAP	11	10	9.52%
Chloride	3.3	3.3	0.00%
Iron Total ICAP	0.025	0.041	48.48%
Kjeldahl Nitrogen	0.32	0.31	3.17%
Magnesium Total ICAP	4.8	4.6	4.26%
Manganese Total ICAP/MS	2.7	2.8	3.64%
Metformin	54	56	3.64%
Nitrate-N by IC	1.1	1.1	0.00%
Nitrate as NO3 (calc)	5	5	0.00%
PH (H3=past HT not compliant)	7.6	7.6	0.00%
Quinoline	--	11	--
Silica	29	27	7.14%
Sodium Total ICAP	5.5	5.3	3.70%
Specific Conductance	120	120	0.00%
Sucralose	170	140	19.35%
Sulfate	7.1	7.1	0.00%
TDCPP	--	310	--
Total Dissolved Solid (TDS)	110	100	9.52%
Total Hardness as CaCO3 by ICP	47	44	6.59%
Total Nitrate, Nitrite-N, CALC	1.1	1.1	0.00%
Total Organic Carbon	1.7	1.5	12.50%
Dissolved Total Phosphorus as P	0.059	0.052	13.46%
Orthophosphate as P	0.014	0.015	6.67%

RPD = [(SPR-SAC) – (SPR-DUP)]/[mean(SPR-SAC,SPR-DUP)] X 100

DATA VALIDATION REPORT 2

Tumwater Study Area Domestic and Public Wells Sampling Event

Laboratory: Eurofins Eaton Analytical

Laboratory Report Numbers: 537802, 549913, 549948, 550118, 550173, 550326, 550335, 550353, 550505, 550551, 550674, 550675, 550676, 550957, 550974, 551174, 551176, 551177, 551217, 551262, 551804, 552591, 552604, 552608, 553903, and 553918

Dates of Sampling: 8/24/2015, 8/25/2015, 8/26/2015, 8/27/2015, 8/28/2015, 8/31/2015, 9/1/2015, 9/3/2015, 9/10/2015, and 9/16/2015

INTRODUCTION

This report presents data validation for the 2015 Tumwater Domestic and Public Wells groundwater sampling event for LOTT Clean Water Alliance (LOTT). These samples were collected in accordance with the procedures and protocols specified in the *Hawks Prairie Groundwater Recharge Project Low-Flow Groundwater Sampling Checklist* and the *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (EQASOP-GW-001). The laboratory data report and Quality Assurance and Quality Control (QA/QC) data are included in this data validation report.

Verification and validation steps addressed in this report are:

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- Minimum Reporting Level (MRL) Check
- Surrogate Spike Recoveries
- Laboratory Matrix Spike/Matrix Spike Duplicates (MS/MSD) Recoveries and Relative Percent Differences (RPD)
- Laboratory Control Sample (LCS) Recoveries
- Laboratory Method Blank
- Duplicate Field Sample

Data that do not satisfy some verification and validation steps are qualified. Qualifier definitions are as follows, unless otherwise noted in subsequent sections:

- J = Analyte is detected and the result is an estimate
- J- = Analyte is detected and the result is an estimate, biased low
- J+ = Analyte is detected and the result is an estimate, biased high
- UJ = Analyte is not detected and the result is an estimate
- R = Result is rejected

SAMPLING PROCEDURES and CHAIN OF CUSTODY

Samples were collected from domestic and public wells located throughout the Tumwater Basin. Wells were purged utilizing the existing potable well pumps installed in each well. Purged water was monitoring for temperature, pH, electrical conductivity, and dissolved oxygen (DO). Purging continued for a minimum of 15 minutes or until at least 3 well volumes of water had been removed. Individual samples were batched separately by the laboratory.

Samples were labeled, sealed, placed in a cooler, and delivered to Eurofins Eaton Analytical in Monrovia, California.

Table D-8. Groundwater Laboratory Analytical Parameters for Samples Collected at Domestic and Public-Supply Wells

Parameter	Method	Hold Time	QC Conducted by Laboratory
Parameters to be Analyzed at all Tumwater Study Area Domestic and Public Supply Wells			
Residual Chemicals	PPCP LC-MS-MS Method	28 days	LCS, Method Blank, MRL Check, MS/MSD
Nitrate, nitrite	EPA 300, 351.1, 351.2	48 hours	LCS, Method Blank, MRL Check, MS/MSD
Ammonia, TKN	EPA 350.1, 351.2	28 days	LCS, Method Blank, MRL Check, MS/MSD
Dissolved total phosphorus, Dissolved orthophosphate	EPA 365.1/SM4500-P-E	28 days	LCS, Method Blank, MRL Check, MS/MSD
Fecal coliform	SM 9223	30 hours	None
Total organic carbon	SM 5310C	28 days	LCS, Method Blank, MRL Check, MS/MSD
Total sulfide	SM4500SD/376.2	7 days	LCS, Method Blank, MRL Check, MS/MSD
Chloride, Sulfate, Bromide	EPA 300.0	28 days	LCS, Method Blank, MRL Check, MS/MSD
Metals (Ag, Al, As, B, Be, Ca, Cd, Cr, Cu, Fe, Hg, Pb, Mg, Mn, Na, Pb, Ni, Se, Sb, Si, Tl, Zn)	EPA 200 series	180 days (28 days for Hg)	LCS, Method Blank, MRL Check, MS/MSD
Total dissolved solids	SM 2540C	7 days	Duplicate, LCS, Method Blank, MRL Check
Alkalinity/carbonate, hardness	SM 2320B, SM 2340B	14 days	LCS, Method Blank, MRL Check, MS/MSD
pH	SM 4500-HB	Immediately upon receipt	Duplicate, LCS
Conductance	SM 2510B	28 days	LCS, Method Blank, MRL Check
Parameters to be Analyzed Only at Tumwater Study Area Domestic Wells			
Metformin and Thiabendazole	LC-MS-MS	35 days	LCS, Method Blank, MRL Check, MS/MSD
SVOCs	EPA 525.2	30 days	LCS, Method Blank, MRL Check, MS/MSD

Parameter	Method	Hold Time	QC Conducted by Laboratory
VOCs	EPA 524.2	14 days	LCS, Method Blank, MRL Check, MS/MSD
PFOS/PFOA + Other PFCs	MWH PFC	28 days	LCS, Method Blank, MRL Check, MS/MSD
Pesticides	EPA 505	14 days (7 days for heptachlor)	LCS, Method Blank, MRL Check, MS/MSD
Herbicides	EPA 515.4	14 days	LCS, Method Blank, MRL Check, MS/MSD

A copy of the completed chain-of-custody (COC) forms is included in the data packages for all batches analyzed for the sampling event. The forms were properly filled out and include relinquished and received signatures. Shipments were received by the laboratory on the day following sampling. The cooler temperatures ranged from 0.4° to 5.3° C, and frozen wet ice was present in each cooler.

HOLDING TIMES

The maximum holding times of groundwater for the various analyses are included in Table D-8. Samples were extracted and analyzed within the holding times with the following exceptions:

- Samples analyzed for Method SM 9223 exceeded hold times for lab reports 537802, 549913, 549948, 550118, 550173, 550326, 550335, 550353, 550505, 550551, 550674, 550675, 550676, 550957, 550974, 551174, 551176, 551177, 551217, 551262, 551804, 552591, 552604, 552608, 553903, and 553918. Non-detect values were qualified as UJ. Samples with detections were qualified as J.
- Some of the residual chemical analytes analyzed using LC-MS-MS methods exceeded hold times for lab samples 537802, 549913, 549948, 550118, 550173, 550326, 550335, 550353, 550505, 550551, 550674, 550675, 550676, 550957, 550974, 551174, 551176, 551177, 551217, 551262, 551804, , 552591, 552604, 552608, 553903, and 553918. The hold time study was conducted in 2016 to determine the effects of long hold times on the pharmaceuticals and personal care products (PPCPs) and perflourinated compounds (PFCs). The results are documented in Data Validation Report 1 (described previously).
- Several of the PFC analytes exceeded hold times for lab reports 549948, 550173, 550505, and 551804. However, as documented previously PFCs are very stable compounds and exceeding hold times was determined not to affect results. No flags were included.

DETECTION LIMIT

Minimum reporting limits (MRLs) are specified by the analytical methods. Analytes with results below the MRL are defined as “ND” (Not Detected). MRLs were less than applicable groundwater quality standards with the exception of the analytes below.

Table D-9. Minimum Reporting Limits Exceeding Respective Water Quality Standards

Analyte	MRL	Units	Groundwater Quality Standard

Analyte	MRL	Units	Groundwater Quality Standard
Arsenic	1	ug/L	0.05
Bromodichloromethane	0.5	ug/L	0.3
Total PCBs	0.1	ug/L	0.01
Aldrin (EPA Method 505)	0.01	ug/L	0.005
Chlordane	0.1	ug/L	0.06
Dieldrin (EPA Method 505)	0.01	ug/L	0.005
Heptachlor Epoxide	0.01	ug/L	0.009
Toxaphene	0.5	ug/L	0.08
1,1,1-Trichloroethane	0.5	ug/L	0.2
Carbon Tetrachloride	0.5	ug/L	0.3
Vinyl chloride (VC)	0.3	ug/L	0.02
Aldrin (EPA Method 525.2)	0.05	ug/L	0.005
Benzo(a)pyrene	0.02	ug/L	0.008
Dieldrin (EPA Method 525.2)	0.2	ug/L	0.005
Heptachlor (EPA Method 525.2)	0.03	ug/L	0.02

MINIMUM REPORTING LEVEL (MRL) CHECK

A reporting level standard is included with every batch/analytical run to confirm the instrument response with the given batch. The following qualifications were made for the data exceeding MRL recoveries QC limits:

Table D-10. Method Reporting Recovery Exceeding QC Limits

Lab Report Number	Sample ID	Analyte	Native Value	MRL_CHK Recovery (%)	Control Limits (%)	Qualifier
537802	RES-521	Di-n-Butylphthalate	ND	156	50-150	UJ
549913	RES-556	1,2,3-Trichlorobenzene	ND	178	50-150	UJ
549913	RES-556	Naphthalene	ND	193	50-150	UJ
549913	RES-556	Pentachlorophenol	ND	153	50-150	UJ
549948	RES-522	1,2,3-Trichlorobenzene	ND	188	50-150	UJ
549948	RES-522	1,2,4-Trichlorobenzene	ND	162	50-150	UJ
549948	RES-522	2,2-Dichloropropane	ND	158	50-150	UJ
549948	RES-522	Hexachlorobutadiene	ND	170	50-150	UJ
549948	RES-522	Naphthalene	ND	194	50-150	UJ
549948	RES-522	Pentachlorophenol	ND	153	50-150	UJ
550118	RES-505	Dimethoate	ND	106	35-100	UJ
550118	RES-505	Permethrin (mixed isomers)	ND	151	50-150	UJ
550173	RES-140	Benzo(a)pyrene	ND	225	50-150	UJ
550173	RES-140	Dimethoate	ND	106	35-100	UJ
550173	RES-140	Di-n-Butylphthalate	ND	157	50-150	UJ
550505	RES-632	Dichloromethane	ND	156	50-150	UJ

Lab Report Number	Sample ID	Analyte	Native Value	MRL_CHK Recovery (%)	Control Limits (%)	Qualifier
550505	RES-632	Di-n-Butylphthalate	ND	156	50-150	UJ
550551	RES-30	Di-n-Butylphthalate	ND	156	50-150	UJ
550551	RES-30	trans-1,3-Dichloropropene	ND	156	50-150	UJ
550674	RES-11	Dichloromethane	ND	156	50-150	UJ
550674	RES-11	Di-n-Butylphthalate	ND	156	50-150	UJ
550675	RES-484	Di-n-Butylphthalate	ND	156	50-150	UJ
550676	RES-403	Dichloromethane	ND	156	50-150	UJ
550676	RES-403	Di-n-Butylphthalate	ND	156	50-150	UJ
550957	RES-622	Dichloromethane	ND	156	50-150	UJ
550957	RES-622	Dimethoate	ND	103	35-100	UJ
550974	RES-126	Dichloromethane	ND	156	50-150	UJ
550974	RES-126	Dimethoate	ND	128	35-100	UJ
550974	RES-126	Pentachlorophenol	ND	155	50-150	UJ
551174	RES-127	Dichloromethane	ND	156	50-150	UJ
551174	RES-127	Dimethoate	ND	128	35-100	UJ
551174	RES-127	Pentachlorophenol	ND	155	50-150	UJ
551176	RES-58	Dichloromethane	ND	156	50-150	UJ
551176	RES-58	Dimethoate	ND	128	35-100	UJ
551176	RES-58	Pentachlorophenol	ND	155	50-150	UJ
551177	RES-202	Dichloromethane	ND	156	50-150	UJ
551177	RES-202	Dimethoate	ND	128	35-100	UJ
551177	RES-202	Pentachlorophenol	ND	155	50-150	UJ
551217	RES-638	1,2,3-Trichlorobenzene	ND	172	50-150	UJ
551217	RES-638	Dimethoate	ND	128	35-100	UJ
551217	RES-638	Naphthalene	ND	160	50-150	UJ
551217	RES-638	Pentachlorophenol	ND	155	50-150	UJ
551217	RES-638	trans-1,3-Dichloropropene	ND	178	50-150	UJ
551262	127-DUP	1,2,3-Trichlorobenzene	ND	172	50-150	UJ
551262	127-DUP	Dimethoate	ND	128	35-100	UJ
551262	127-DUP	Naphthalene	ND	160	50-150	UJ
551262	127-DUP	Pentachlorophenol	ND	155	50-150	UJ
551262	127-DUP	trans-1,3-Dichloropropene	ND	178	50-150	UJ
551804	RES-335	1,2,3-Trichlorobenzene	ND	168	50-150	UJ
551804	RES-335	2-Butanone (MEK)	ND	160	50-150	UJ
551804	RES-335	cis-1,3-Dichloropropene	ND	176	50-150	UJ
551804	RES-335	Naphthalene	ND	222	50-150	UJ
551804	RES-335	trans-1,3-Dichloropropene	ND	196	50-150	UJ

SURROGATE SPIKE RECOVERIES

Surrogates are organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analysis. Surrogate spikes were added to each sample associated with EPA 515.4 - Chlorophenoxy Herbicides, EPA 505 - Organochlorine Pesticides/PCBs, EPA 525.2 - Semivolatiles by GCMS, and EPA 524.2 - Volatile Organics by GCMS. Recoveries were reviewed and evaluated for adherence to the control limits specified for the various analytical methods:

Table D-11. Surrogate Recovery Control Limits

Surrogate Parameter	Control Limits (% recovery)
EPA 515.4 - Chlorophenoxy Herbicides	
2,4-Dichlorophenyl acetic acid	70-130
EPA 505 - Organochlorine Pesticides/PCBs	
Tetrachlorometaxylene	70-130
EPA 525.2 - Semivolatiles by GCMS	
1,3-Dimethyl-2-nitrobenzene	70-130
Perylene-d12	70-130
Triphenylphosphate	70-130
EPA 524.2 - Volatile Organics by GCMS	
1,2-Dichloroethane-d4	70-130
4-Bromofluorobenzene	70-130
Toluene-d8	70-130

For groundwater samples analyzed in this batch, surrogate recoveries were all within control limits.

LABORATORY MATRIX SPIKES/SPIKE DUPLICATES (MSD/MSD) RECOVERIES and RELATIVE PERCENT DIFFERENCES (RPD)

To assess potential matrix effects, an environmental sample and a duplicate are spiked with known concentrations of target analytes. The percent recovery of the target analytes is compared to statistical control limits.

Analytes that failed both MS and MSD are qualified as estimated. Analytes that were not detected and that had MS/MSD recoveries below 10 percent were rejected. Analytes that failed on only the MS or the MSD are considered acceptable and the data are not qualified for these analytes. Sample concentrations that exceed the spike added concentrations by more than a factor of four are not flagged.

MS and MSD recoveries were all within the QC limits with the following exceptions noted below. In addition, in instances where the spike recovery is high, but the results is ND, there is no impact on the data since ND with high recovery is still ND. Samples spiked for MS/MSD from non-LOTT projects were not evaluated.

Table D-12. Laboratory Matrix Spikes and Spike Duplicates Exceeding QC Limits

Lab Report Number	Sample ID	Analyte	Native Value	MS % Yield	MSD % Yield	QC Limits (%)	Qualifier
537802	RES-521	1,7-Dimethylxanthine	ND	15	15	60-140	UJ
537802	RES-521	Acetaminophen	ND	40	39	60-140	UJ
537802	RES-521	Ketorolac	ND	38	35	60-140	UJ
537802	RES-521	Lidocaine	ND	34	31	60-140	UJ
537802	RES-521	Pentoxifylline	ND	31	30	60-140	UJ
537802	RES-521	Phenazone	ND	47	39	60-140	UJ
537802	RES-521	Sulfadiazine	ND	3.8	4.8	60-140	R
537802	RES-521	Thiabendazole	ND	39	36	60-140	UJ
537802	RES-521	Trimethoprim	ND	39	39	60-140	UJ
550326	RES-197	1,7-Dimethylxanthine	ND	1.7	1.6	60-140	R
550326	RES-197	Bromacil	ND	47	47	60-140	UJ
550326	RES-197	Chloridazon	ND	43	46	60-140	UJ
550326	RES-197	Fluoxetine	ND	55	59	60-140	UJ
550326	RES-197	Ketorolac	ND	50	51	60-140	UJ
550326	RES-197	Sulfadiazine	ND	25	25	60-140	UJ
550326	RES-197	Thiabendazole	ND	6.5	7.8	60-140	R
550676	RES-403	Kjeldahl Nitrogen	ND	86	88	90-110	UJ

The RPD for the MS/MSD were within acceptable laboratory tolerances.

LABORATORY CONTROL SAMPLE (LCS) RECOVERIES

Laboratory Control Samples (LCS) are samples of known concentration that are carried through the extraction and analysis process. The percent recovery is the percentage of the theoretical concentration, and has statistical control limits indicating that the analytical process is "in control."

An LCS sample was run in duplicate with the work order samples. LCS recoveries were all within the QC limits with the exceptions noted below. In addition, in instances where the LCS recovery is high, but the native result is ND, there is no impact on the data since ND with high recovery is still ND.

Table D-13. Laboratory Control Samples Exceeding QC Limits

Lab Report Number	Sample ID	Analyte	Native Value	LCS1 Yield %	LCS2 Yield %	QC Limits (%)	Qualifier
550957	RES-622	Aldrin	ND	67	67	70-130	UJ

LABORATORY METHOD BLANK

An aliquot of reagent water was carried through the entire analytical process. The method blank results indicate any possible contamination exposure during the sample handling, digestion, or extraction process and analysis. In most instances, compounds were not detected at or above the method reporting limits. For compounds that were detected at or above the reporting limit, the result of the native sample was either a non-detect or ten times greater than the method blank result. Therefore, no qualifications were made.

DUPLICATE FIELD SAMPLE

A duplicate sample was secured for RES-127 (Duplicate: DUP-127). The results of the duplicate are presented below. RPDs ranged from 0% to 53%. Generally, a RPD of less than 20 percent is desirable. Only Dissolved Total Phosphorus as P (Dissolved) and Cation Sum - Manual Calculation exceeded the 20% RPD.

Table D-14. Relative Percent Difference (RPD) for Duplicate Sample from RES-127

Analyte	Units	Parent RES-127		Duplicate 127-DUP		RPD (%)
Orthophosphate as P (Dissolved)	mg/L	0.019		0.016		17.1%
Total Dissolved Solid (TDS)	mg/L	150		170		12.5%
Calcium Total ICAP (Dissolved)	mg/L	19		20		5.1%
Magnesium Total ICAP (Dissolved)	mg/L	9.4		9.6		2.1%
Sodium Total ICAP (Dissolved)	mg/L	6.9		7.1		2.9%
Bromide	ug/L	17		18		5.7%
Chloride	mg/L	3.6		3.5		2.8%
Nitrate-N by IC	mg/L	6.5		6.2		4.7%
Nitrate as NO3 (calc)	mg/L	29		27		7.1%
Total Nitrate, Nitrite-N, CALC	mg/L	6.5		6.2		4.7%
Metformin	ng/L	ND	UJ	160	J-	--
Propylparaben	ng/L	ND	UJ	6.9	J-	--
Anion Sum - Calculated	meq/L	2		1.9		5.1%
Cation Sum - Manual Calculation	%	3		5		50.0%
Total Hardness as CaCO3 by ICP (Dissolved)	mg/L	86		89		3.4%
Specific Conductance	umho/cm	210		200		4.9%
PH (H3=past HT not compliant)	Units	7.2	J	7	J	2.8%
Dissolved Total Phosphorus as P (Dissolved)	mg/L	0.074		0.043		53.0%

RPD = [(RES-127) – (DUP-127)]/[mean(RES-127,DUP-127)] X 100

Attachment A

Hold Time Study Documentation

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Memorandum

To: Wendy Steffensen, LOTT Clean Water Alliance	
From: John Koreny and Jeff Hansen, HDR	Project: LOTT Reclaimed Water Infiltration Study
CC:	
Date: November 9, 2016	Job No: 238761

RE: Hold Time Analysis, PPCPs and Metformin

Background

Eurofins Eaton Analytical, Inc. (EEA), the laboratory under contract to provide analytical services in support of LOTT's Reclaimed Water Infiltration Study, or RWIS) has completed an analysis to determine the effects of extended hold times on pharmaceuticals and personal care products (PPCPs), perfluorinated compounds (PFCs) and metformin (referred to collectively as "residual chemicals" in the RWIS). This analysis was completed to address questions that have arisen regarding the 28 to 70 day hold times that occurred between sample collection and analysis during the 2015 groundwater, surface water, and reclaimed water quality characterization efforts regarding PPCPs, PFCs and metformin. Although EEA's laboratory method has no formalized hold times for these compounds, these hold times are longer than the 28 day analytical schedule EEA customarily utilizes for processing such samples. (Other parameters analyzed as part of the RWIS were almost all run within established formal hold times.) The full details of this issue are explained in a May, 16, 2016 memorandum by HDR.

Some of the reviewers of the draft Task 1 (Water Quality Characterization) technical memoranda have asked whether extended hold times for these compounds may have caused bias in the reported concentrations of PPCPs, PFCs and metformin. In response, EEA prepared information documenting that PFCs are very stable with hold times past 70 days (presented in the HDR May 16, 2016 memorandum). EEA also agreed to conduct a hold time study evaluating the effects of extending the hold times to 70 days for PPCPs and metformin. The methods and results of that study are presented in EEA's November 4, 2016 report, "Holding Time Study Results for PPCPs and Metformin, LOTT Clean Water Alliance Project," and the full analytical results are presented in an electronic spreadsheet. Both items are incorporated by reference to this memorandum.

Summary of Method

A full explanation of EEA's methods are presented in EEA's November 4, 2016 report. A brief description is below:

- Three Class A reclaimed water samples (each comprised of four 1-liter bottles with preservative) were collected at the Martin Way Reclaimed Water Plant on June 15, 2016. Upon receipt by EEA, the four bottles comprising each sample were composited so as to provide 4-liter sample volumes for each sample. These were then analyzed for PPCPs and metformin. Between 19 and 22 compounds were detected above the method detection limits in the three samples.
- One sample was then spiked on June 30, 2016, with a known concentration in the range of 1 to 4 parts per billion (ppb) for each of 98 compounds. Eleven replicates of the spiked sample were each run on LC-MS-MS instrumentation at 0, 2, 4, 7, 16, 30, 45, 60, 69 and 84 days after the spike. For each run, a 1 to 10 dilution was employed to ensure that the results were within the

range of the LOTT sample results and within the range of the calibration curve for the instrument.

- Two Laboratory Control Samples (LCS) were prepared using spiked reagent water and run for each of the periods specified above. The purpose of the LCS is to identify the range of variability in the method and instrument results.

Summary of Results

The results of the study indicate that 90 of the 98 compounds evaluated appear to remain stable throughout the 84 day period. Eight compounds appear to show evidence of degradation or analytical variability.

- Two compounds (metazachlor and metolachlor) begin to degrade after approximately two weeks. "R" data quality flags are recommended for samples analyzed after approximately two weeks indicating that the data are unreliable. An "R" flag indicates that, "The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified." (Ecology, 2016)[1].
- Four compounds (amoxicillin, azithromycin, cimetidine, and nonyl-phenol) show analytical variability on individual days and between days. Therefore, the results for those should be considered semi quantitative (i.e., concentration results are estimates). "J" data quality flags are recommended in the reports for all of the results for these compounds. A "J" flag indicates that, "The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample." (Ecology, 2016).
- Two compounds (nifedipine and theophyline) show concentrations consistently under or over the laboratory control sample (LCS) limits, but no evidence of inconsistent variability or degradation. This appears to be the result of a sample matrix effect or calibration artifact for this sample. "J" data quality flags are recommended for these two compounds.

Recommendations

The following recommendations are proposed for the technical memoranda documenting the 2015 groundwater, surface water and wastewater/reclaimed water sampling and water quality analysis.

- The EEA November 4, 2016 hold time study report will be included by reference into each of HDR's reports. The results will be summarized in the laboratory data validation section of each report.
- The laboratory data summary tables will be flagged as suggested by EEA (and as summarized above).
    - Because all metazachlor and metolachlor samples were analyzed past a two week hold time, all of the results for these two parameters will be assigned an "R" data quality flag.
    - All amoxicillin, azithromycin, cimetidine, nifedipine, nonyl-phenol and theophyline results will be assigned a "J" data quality flag. All of these chemicals (with the exception of theophyline, which was not included in the original list of analytes sampled for in wastewater and reclaimed water) were detected at least once in raw wastewater, while only nifedipine and nonyl-phenol were also detected in reclaimed water. None of these compounds were detected in any of the groundwater and surface water samples, with the exception of a detection of nonyl-phenol in one groundwater well.

[1] Source: http://www.ecy.wa.gov/programs/eap/mar_wat/datacodes.html.

    - All other data quality flags regarding hold times will be removed for PPCPs, PFCs and metformin from the summary tables in the report.

- Future PPCP, PFC and metformin analysis for the LOTT RWIS project will be run within a 28-day hold time from the date of sample collection.

eurofins | Eaton Analytical

November 4, 2016

To: John Koreny and Jeff Hansen, HDR Engineering, Inc.

From: Andy Eaton and Ali Haghani, Eurofins Eaton Analytical, Inc. (EEA)

cc: Vanessa Berry (EEA), Brad Cahoon (EEA), Daniel Lashbrook (EEA), Robert Dean (EEA)

Subject: Holding Time Study Results for PPCPs (EEA Method 9609 and Metformin), LOTT Clean Water Alliance Project

Introduction

A study was completed by Eurofins Eaton Analytical, Inc. (EEA) to determine the effects of holding preserved refrigerated water samples for a period of up to 84 days (12 weeks) prior to analysis using EEA's Method 9609 "Pharmaceuticals and Personal Care Products (PPCPs)" and Metformin. This study was completed as part of the LOTT Clean Water Alliance (LOTT) project evaluating the presence of PPCPs (also referred to by LOTT as Residual Chemicals) in surface water, groundwater and treated wastewater (reclaimed water) in the South Puget Sound area of Washington State. The reason for conducting the hold time study is that during the prior sampling of groundwater, surface water and reclaimed water, hold times were up to 10 weeks after sampling for the PPCP and Metformin laboratory analysis. The purpose of the hold time study is to examine the effects these extended hold times may have on the analytical results and to recommend whether data quality flags should be included in laboratory reporting.

The hold time study was completed by spiking one reclaimed water sample with a known concentration of the target PPCP compounds and performing 11 replicate analyses on the sample each at periods of 0, 2, 4, 7, 16, 30, 45, 60, 69, and 84 days.

The results of the study indicate that 92 out of the 98 compounds reported appear to remain stable through the length of the hold time study. Six compounds appear to show evidence of either degradation or analytical variability.

- Two compounds (metazachlor and metolachlor) begin to degrade after approximately 2 weeks. "R" data quality flags are recommended in the reports for all of the results for these compounds after degradation starts.

- Additionally, four compounds (amoxicillin, azithromycin, cimetidine, and nonyl-phenol) show analytical variability on individual days and between days; thus, results for those should be considered semi quantitative (results are estimates). "J" flags are recommended in the reports for all of the results for these compounds.

In addition, two compounds (nifedipine and theophyline) show concentrations consistently under or over the laboratory control sample (LCS) limits, but no evidence of inconsistent variability or degradation. This appears to be the result of a sample matrix effect or calibration artifact for this sample. ”J” flags are recommended in the reports for these compounds.

Methods

The methods used for the holding time study are summarized below.

- Three 4-liter grab samples were collected by HDR from the LOTT Martin Way Reclaimed Water Plant on June 15, 2016, using bottles provided by EEA, containing sodium omadine and ascorbic acid as preservatives. The samples were placed on ice and transmitted by next-day air delivery to EEA’s laboratory in Monrovia, California.

- The three 4-liter samples were received on June 16, 2016 and were each composited to create samples A, B and C. The three samples were analyzed using Liquid Chromatography-Tandem Mass Spectrometry (LC-MS-MS) as per the Method 9609 process on June 16 and for metformin on June 17, within 2 days of receipt, and retested the following week using high resolution mass spectrometry.

- All of the samples exhibited similar results. However, Sample A was chosen for the hold time study because it had fewer unknown peaks than the other two after looking at the full scan high resolution mass spectrometry data.

- EEA then prepared the spike sample on June 30, 2016, which was 15 days after the sample was collected. EEA spiked a 100 ml aliquot of Sample A with 1- 4 ppb of each target analyte and then transferred it to 5ml amber vials and stored refrigerated.

- The spiked Sample A was then run on the LC-MS-MS at periods of 0, 2, 4, 7, 16, 30, 45, 60, 69, and 84 days after spiking the sample on June 30, 2016. For each run, one of the vials was brought to room temperature, diluted 1/10 into 11 auto-sampler vials, the internal standard was added, and each vial analyzed. The 1/10 dilution ensured that all compounds would be within the range of the results for the LOTT study and within the range of the calibration curve (so multiple dilutions would not be required and the study could be completed within the allocated time period). Eleven replicates were analyzed on each day in order to provide a more robust understanding of the effects of hold times and analytical precision.

- With each batch we included two freshly prepared Laboratory Control Standards (LCS) consisting of reagent water spiked with the target analytes, to monitor instrument performance in the absence of matrix effects and holding time effects.

- Fresh calibration working stock standards (WSS) were prepared periodically, as noted below. Calibration stock preparation dates are indicated on the raw data worksheets. The original calibration standard was changed after 16 days because we started at that time to see changes in albuterol and we were not sure if it was the matrix or the WSS. After day 16 a fresh working stock standard was prepared for calibrations and the LCS for each analytical sequence to avoid any questions regarding calibration stability.

Results

Evaluation of Results

- Results are presented in the form of percent recoveries (i.e., with 100% reflecting the known spiked concentration). To facilitate analysis of the data for observing trends, all results were normalized to the day 0 recoveries by averaging all 11 of the day 0 recovery measurements (measurements made the same day as the sample was spiked) for each compound and comparing subsequent measurements to that average.

- To evaluate possible degradation, data were compared to both recovery ranges calculated from both the 20 LCS samples analyzed with these holding time samples and the limits set in the lab Laboratory Information Management System (LIMS) database for the LCS samples, which are based on longer term observed historical precision. Additionally, when the compounds were also included in EPA method 1694, results were reviewed against the limits found in that method, which are generally much wider than the EEA limits. Note that all of these limits are for reagent water and do not take into account any matrix effects expected from analyzing reclaimed water samples.

- In some cases data are missing for a particular analyte on some days because the calibration did not come out on that day for that compound or no peak was identified by the mass spectrometer. The causes for these aberrant data are not clear. These are shown as blanks in the tables and Excel workbook.

Presentation of Results

The project results are summarized in Tables 1 to 3. Table 1 includes the summary data (normalized against day 0) and the EEA conclusions regarding stability. Table 2 includes the LCS limits, as described below. Table 3 includes the raw data, as described below.

Also, the full analytical data package is provided electronically in the Excel workbook titled, “HDR-Lott project holding time study 20160929”. The Excel workbook has multiple tabs within it, including:

- Tab “raw data”: Raw data as percent recovery not normalized and normalized results compared to the average of day 0 recoveries and standard deviations and relative standard deviations of the 11 replicates on each day
- Tab “LCS Calculated Control Limits”: Upper and lower Laboratory Control Sample (LCS) control limits calculated from the 20 associated QC samples (LCS – spiked reagent water).
- Tab “Summary and Conclusions”: Summary of normalized data, LCS limits, and EEA conclusions on stability of each compound
- Tab “HDR Target List”: HDR target analyte list.
- Tab “1694 QC limits”: LCS limits found in EPA method 1694.
- Tab “Spiked levels”: Spiking levels for each compound for holding time study and concentration expected in samples when analyzed
- Tab “WSS recoveries over time”: Information on working stock standard recoveries reanalyzed on each day with the new WSS used for calibration on that analysis day to determine any potential problems with standard preparation on a given day.
- Tab “Rerun WSS day 0”: Ratio of working stock standard (WSS) from analysis day compared to initial day 0 WSS (based on the average of the LCS samples on day 0 which were prepared from the day 0 WSS). This is another way to determine if compounds in individual WSS might have been incorrectly prepared on a given day or even if the day 0 WSS had any preparation issues. Note that the primary stock standard diluted and used to prepare the WSS was not changed through the course of the study.
- Tab “Cal Tech and Internal standard”: Detailed information on calibration technique (internal standard calibration or external calibration) used for each compound, including the compound used as an internal standard for quantitation when the internal standard technique was used and the mix used for individual compounds, as preparing the 98 compounds required the use of 9 unique stock standard mixes.
- Tab “analysis of unspiked sample”. This shows the results for the original 3 samples of reclaimed water submitted for evaluation for use in the

spiking study. Because all samples had similar concentrations, sample MWRW-A was used for spiking.

Summary of Results

The results of the study indicate that 92 out of the 98 compounds reported appear to remain stable through the length of the hold time study. Six compounds appear to show evidence of either degradation or analytical variability.

- Two herbicides are clearly degrading over the course of the 84 day study (metazachlor and metolachlor). Both of these show significant degradation in this matrix within ~2 weeks. Metazachlor is almost completely gone, but metolachlor is still present after 84 days, but at only ~ 30% of the original concentration. Results for these two compounds should be flagged as “R”, rejected data, for samples analyzed after two weeks. Note that metolachlor was also included in the LOTT results provided using Method 525, but with higher reporting limits.

- Three compounds (cimetidine, amoxicillin, and nonyl-phenol) all showed poor precision during the study (and are normally considered semiquantitative by EEA) and results are inconclusive because of that and should be flagged with a “J”, as estimated results. No data are available for azithromycin because calibration results were poor, and it could not be included in the holding time study, so data for this compound should also be flagged with a “J”, as estimated results.

- In addition, two compounds (nifedipine and theophyline) show concentrations consistently under or over the laboratory control sample (LCS) limits, but no evidence of inconsistent variability or degradation. This appears to be the result of a sample matrix effect or calibration artifact for this sample. ”J” flags are recommended in the reports for these compounds.

Table 1. Summary Data and Conclusions

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability					
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016						
Days Since Spike						0	2	4	7	16	30	45	60	69	84						
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)		Comment
17 alpha ethynylestradiol - M-H					**Average**	89.2	88.3	89.3	88.5	82.3	77.2	99.3	110.7	127.5	95.1						
					Stdev	9.3	5.2	7.1	6.5	7.5	3.9	8.4	8.5	17.9	13.9						
	60	140	72	138	Normalized	100%	99%	100%	99%	92%	87%	111%	124%	143%	107%	x					
					% Rsd	10.4%	5.8%	7.9%	7.3%	9.1%	5.1%	8.5%	7.7%	14.0%	14.7%						
17B-Estradiol - M-H					**Average**	97.9	98.1	95.7	94.2	81.6	78.8	105.1	106.8	118.8	96.6						
					Stdev	4.7	2.9	2.2	10.5	7.9	3.7	7.0	6.7	14.9	7.6						
	60	140	72	140	Normalized	100%	100%	98%	96%	83%	81%	107%	109%	121%	99%	x					
					% Rsd	4.8%	2.9%	2.3%	11.1%	9.6%	4.7%	6.7%	6.2%	12.5%	7.9%						
2,4-D					**Average**	125.1	89.0	122.8	123.7	111.8	85.2	107.6	111.1	143.6	143.8						
					Stdev	15.0	10.1	10.3	10.7	11.5	6.1	10.1	8.0	17.9	19.1						
	60	140	54	141	Normalized	100%	71%	98%	99%	89%	68%	86%	89%	115%	115%	x					
					% Rsd	12.0%	11.3%	8.4%	8.7%	10.3%	7.2%	9.3%	7.2%	12.4%	13.3%						
4-tert-OctylphenoL					**Average**	84.5	120.9	122.5	129.7	63.5	81.4	127.5	109.6	104.4	97.6						
					Stdev	6.6	10.3	8.5	15.5	21.8	4.5	13.2	15.4	12.0	10.8						
	60	140	59	121	Normalized	100%	143%	145%	154%	75%	96%	151%	130%	124%	116%	x					
					% Rsd	7.8%	8.5%	7.0%	11.9%	34.3%	5.6%	10.4%	14.1%	11.5%	11.0%						
Acesulfame					**Average**	95.6	97.0	95.3	94.8	96.6	88.2	104.8	99.5	119.0	125.5						
					Stdev	6.3	6.4	8.2	9.4	3.1	5.3	6.9	5.5	3.2	7.7						
	60	140	93	110	Normalized	100%	101%	100%	99%	101%	92%	110%	104%	124%	131%	x					
					% Rsd	6.6%	6.6%	8.6%	9.9%	3.2%	6.0%	6.6%	5.5%	2.7%	6.1%						
Acetaminophen					**Average**	89.7	103.9	110.9	105.7	86.2	75.9	105.0	85.9	73.1	80.9						
					Stdev	10.6	15.4	7.1	15.0	13.1	8.6	7.8	8.9	8.5	5.7						
	60	140	84	113	Normalized	100%	116%	124%	118%	96%	85%	117%	96%	82%	90%	x					
					% Rsd	11.9%	14.8%	6.4%	14.2%	15.1%	11.3%	7.5%	10.3%	11.7%	7.0%						
Albuterol					**Average**	105.9	107.2	105.6	119.8	127.7	74.5	152.4	592.6	102.8	122.5						
					Stdev	10.2	6.4	19.1	18.9	16.4	22.6	22.3	206.9	15.8	14.1						
	60	140	24	156	Normalized	100%	101%	100%	113%	121%	70%	144%	560%	97%	116%	x					Working std problem on day 60
					% Rsd	9.6%	6.0%	18.1%	15.8%	12.9%	30.3%	14.7%	34.9%	15.4%	11.5%						

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)	Comment
Amoxicilin					**Average**	32.5	28.8	38.3	35.5	310.2	101.2	408.7	678.3	682.7	604.5					
					Stdev	13.8	6.2	14.8	10.7	46.1	17.1	55.9	62.5	63.9	61.4					
	60	140	61	147	Normalized	100%	89%	118%	109%	953%	311%	1256%	2085%	2099%	1858%			x		Continuing WSS did not match day 0. Considered semi-quantitative
					% Rsd	42.4%	21.4%	38.6%	30.1%	14.9%	16.9%	13.7%	9.2%	9.4%	10.2%					
Andorostenedione					**Average**	68.9	61.4	65.0	72.7	85.4	49.8	78.7	91.1	87.7	101.1					
					Stdev	7.8	8.7	6.1	10.0	10.3	5.7	10.7	19.2	8.9	12.1					
	60	140	63	139	Normalized	100%	89%	94%	106%	124%	72%	114%	132%	127%	147%	x				
					% Rsd	11.3%	14.2%	9.3%	13.8%	12.0%	11.5%	13.6%	21.1%	10.1%	12.0%					
Atenolol					**Average**	47.3	38.0	39.4	47.4	40.9	33.7	46.7	69.2	56.9	51.7					
					Stdev	4.7	2.8	2.6	4.3	1.9	2.1	3.9	9.4	2.9	2.3					
	60	140	67	138	Normalized	100%	80%	83%	100%	86%	71%	99%	146%	120%	109%	x				
					% Rsd	10.0%	7.3%	6.7%	9.0%	4.6%	6.3%	8.4%	13.6%	5.1%	4.5%					
Atrazine					**Average**	72.7	72.1	71.9	66.7	85.1	65.3	73.5	63.4	85.4	76.6					
					Stdev	3.5	5.6	4.0	9.2	2.3	3.3	3.9	5.2	3.2	5.9					
	60	140	82	121	Normalized	100%	99%	99%	92%	117%	90%	101%	87%	117%	105%	x				
					% Rsd	4.9%	7.8%	5.5%	13.7%	2.7%	5.0%	5.3%	8.2%	3.8%	7.7%					
Azithromycin	60	140	not tested														x			Unable to get reliable calibration. Semi quant
Bendroflumethiazide - M-H					**Average**	171.0	170.4	174.8	166.0	102.5	261.8	125.3	114.9	137.3	112.2					
					Stdev	12.8	13.7	12.7	11.5	4.5	11.4	7.8	17.0	7.8	8.4					
	60	140	74	116	Normalized	100%	100%	102%	97%	60%	153%	73%	67%	80%	66%	x				Continuing WSS did not match day 0 WSS. Drop due to calibration issues
					% Rsd	7.5%	8.0%	7.3%	7.0%	4.4%	4.4%	6.2%	14.8%	5.7%	7.5%					
Bezafibrate					**Average**	166.9	166.4	163.2	179.4	137.7	145.4	206.4	177.0	188.9	185.4					
					Stdev	10.9	7.1	9.9	8.8	9.5	6.1	15.2	18.1	13.7	13.5					
	60	140	74	126	Normalized	100%	100%	98%	107%	82%	87%	124%	106%	113%	111%	x				
					% Rsd	6.5%	4.3%	6.1%	4.9%	6.9%	4.2%	7.3%	10.2%	7.3%	7.3%					
Bisphenol A					**Average**	101.8	94.6	95.2	97.0	89.8	72.8	97.1	104.4	98.2	93.4					
					Stdev	10.7	2.3	3.2	6.8	4.4	3.4	3.4	21.5	3.6	3.4					
	60	140	90	110	Normalized	100%	93%	94%	95%	88%	72%	95%	103%	96%	92%	x				
					% Rsd	10.5%	2.5%	3.3%	7.0%	4.9%	4.7%	3.5%	20.6%	3.6%	3.7%					
Bromacil					**Average**	132.8	129.8	135.1	145.0	111.3	131.0	163.6	118.4	133.4	142.3					

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)	Comment
					Stdev	9.5	10.1	9.5	13.1	9.0	6.3	9.3	21.1	10.4	13.6					
	60	140	79	111	Normalized	100%	98%	102%	109%	84%	99%	123%	89%	100%	107%	x				
					% Rsd	7.2%	7.8%	7.0%	9.0%	8.1%	4.8%	5.7%	17.8%	7.8%	9.5%					
Clofibric acid					**Average**	131.7	134.6	124.7	131.4	124.3	101.8	126.7	103.1	118.9	124.9					
					Stdev	4.9	5.5	3.7	4.7	8.7	4.8	5.1	6.1	19.8	7.5					
	60	140	75	129	Normalized	100%	102%	95%	100%	94%	77%	96%	78%	90%	95%	x				
					% Rsd	3.7%	4.1%	3.0%	3.6%	7.0%	4.7%	4.1%	5.9%	16.6%	6.0%					
Butalbital					**Average**	106.0	113.7	114.4	134.8	120.6	112.7	122.4	133.4	141.3	137.2					
					Stdev	8.4	9.4	7.3	10.7	6.8	4.6	10.3	40.1	11.7	9.6					
	60	140	75	116	Normalized	100%	107%	108%	127%	114%	106%	115%	126%	133%	129%	x				
					% Rsd	7.9%	8.2%	6.4%	7.9%	5.7%	4.1%	8.5%	30.1%	8.3%	7.0%					
Butylparaben-NEG					**Average**	96.5	98.0	96.9	98.1	92.1	98.1	121.0	106.6	146.0	115.6					
					Stdev	3.3	3.5	2.8	7.4	3.1	4.3	4.4	3.8	16.9	4.3					
	60	140	68	129	Normalized	100%	102%	100%	102%	95%	102%	125%	110%	151%	120%	x				WSS bias on day 69.
					% Rsd	3.4%	3.6%	2.9%	7.5%	3.4%	4.3%	3.7%	3.5%	11.6%	3.7%					
Caffeine					**Average**	99.2	110.2	110.2	99.4	98.1	94.2	105.4	120.8	112.2	111.1					
					Stdev	23.5	30.2	19.8	26.9	33.6	29.1	37.3	52.9	19.5	37.9					
	60	140	86	121	Normalized	100%	111%	111%	100%	99%	95%	106%	122%	113%	112%	x				
					% Rsd	23.7%	27.4%	18.0%	27.0%	34.3%	30.9%	35.4%	43.8%	17.3%	34.1%					
Carbadox					**Average**	107.8	104.2	103.7	99.1	106.8	84.3	110.6	121.8	120.7	130.1					
					Stdev	10.4	10.0	11.5	15.5	7.6	14.0	12.1	14.7	22.2	20.4					
	60	140	61	140	Normalized	100%	97%	96%	92%	99%	78%	103%	113%	112%	121%	x				
					% Rsd	9.7%	9.6%	11.1%	15.7%	7.1%	16.6%	10.9%	12.1%	18.4%	15.6%					
Carbamazepine					**Average**	129.4	126.7	128.2	130.6	121.1	96.0	120.6	124.4	132.9	128.6					
					Stdev	4.5	3.7	5.5	10.1	7.2	4.3	4.9	6.4	5.8	6.2					
	60	140	81	118	Normalized	100%	98%	99%	101%	94%	74%	93%	96%	103%	99%	x				
					% Rsd	3.5%	2.9%	4.3%	7.8%	5.9%	4.5%	4.1%	5.2%	4.4%	4.8%					
Carisoprodol					**Average**	115.1	126.0	140.6	142.5	101.9	184.6	185.4	100.1	143.8	151.1					
					Stdev	17.6	21.2	29.8	28.8	15.0	156.5	68.0	31.8	16.0	24.7					
	60	140	53	139	Normalized	100%	109%	122%	124%	89%	160%	161%	87%	125%	131%	x				
					% Rsd	15.3%	16.9%	21.2%	20.2%	14.7%	84.8%	36.7%	31.8%	11.1%	16.3%					
Chloramphenicol_M-H					**Average**	104.4	102.6	97.7	101.7	106.6	86.0	102.9	77.4	98.3	97.9					
					Stdev	6.9	5.7	7.8	9.0	9.0	6.9	7.6	3.9	11.2	9.5					
	60	140	66	134	Normalized	100%	98%	94%	97%	102%	82%	99%	74%	94%	94%	x				
					% Rsd	6.6%	5.6%	8.0%	8.8%	8.5%	8.1%	7.4%	5.0%	11.4%	9.7%					

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)	Comment
Chloridazon					**Average**	82.1	80.0	91.5	92.0	72.4	86.5	111.0	91.2	118.4	130.9					
					Stdev	9.4	7.7	10.4	8.7	24.1	7.3	11.4	9.5	8.9	16.7					
	60	140	75	120	Normalized	100%	97%	111%	112%	88%	105%	135%	111%	144%	159%	x				Positive bias in day 69 and 84 WSS
					% Rsd	11.5%	9.6%	11.3%	9.5%	33.3%	8.5%	10.3%	10.4%	7.5%	12.7%					
Chlorotoluron					**Average**	98.8	94.3	100.9	104.5	95.7	102.2	142.1	121.7	143.9	139.0					
					Stdev	6.2	5.0	4.8	10.0	4.5	5.4	7.9	10.3	9.4	9.6					
	60	140	75	123	Normalized	100%	95%	102%	106%	97%	103%	144%	123%	146%	141%	x				No obvious reason for increase in results.
					% Rsd	6.3%	5.3%	4.8%	9.6%	4.7%	5.2%	5.5%	8.4%	6.5%	6.9%					
Cimetidine - PRM					**Average**	39.2	52.9	33.6	108.2	18.9	no data	17.2	no data	35.2	14.5					
					Stdev	3.3	3.8	3.8	7.5	5.9	no data	4.5	no data	6.9	3.3					
	60	140	71	133	Normalized	100%	135%	86%	276%	48%	no data	44%	no data	90%	37%			x		Difficult to calibrate-semi-quant.
					% Rsd	8.5%	7.2%	11.4%	6.9%	31.3%	no data	26.3%	no data	19.5%	22.5%					
Cotinine - PRM					**Average**	113.3	115.1	127.6	96.6	100.5	84.7	97.3	116.8	115.2	123.3					
					Stdev	8.7	6.3	11.5	6.7	8.7	11.7	7.5	23.6	9.5	12.7					
	60	140	75	120	Normalized	100%	102%	113%	85%	89%	75%	86%	103%	102%	109%	x				
					% Rsd	7.7%	5.5%	9.0%	6.9%	8.6%	13.8%	7.8%	20.2%	8.2%	10.3%					
Cyanazine					**Average**	73.9	75.6	74.1	72.6	54.6	64.0	70.8	50.3	70.7	67.7					
					Stdev	3.5	2.4	2.7	5.1	45.8	3.3	3.8	28.5	4.4	3.3					
	60	140	88	112	Normalized	100%	102%	100%	98%	74%	87%	96%	68%	96%	92%	x				
					% Rsd	4.7%	3.2%	3.7%	7.0%	84.0%	5.2%	5.4%	56.6%	6.3%	4.9%					
DACT					**Average**	179.2	156.5	208.0	174.0	158.0	185.1	197.4	215.3	142.9	199.2					
					Stdev	26.4	33.1	31.4	30.0	19.9	26.7	33.8	63.9	18.3	23.4					
	60	140	61	128	Normalized	100%	87%	116%	97%	88%	103%	110%	120%	80%	111%	x				
					% Rsd	14.8%	21.1%	15.1%	17.3%	12.6%	14.4%	17.1%	29.7%	12.8%	11.7%					
DEA					**Average**	92.8	88.7	97.1	106.9	73.0	64.8	101.2	67.2	96.3	131.5					
					Stdev	18.0	15.8	12.3	28.6	16.3	12.2	16.9	17.7	10.8	45.0					
	60	140	86	117	Normalized	100%	96%	105%	115%	79%	70%	109%	72%	104%	142%	x				No obvious cause for day 84 change.
					% Rsd	19.4%	17.8%	12.6%	26.8%	22.4%	18.8%	16.7%	26.3%	11.2%	34.2%					
DEET					**Average**	80.7	79.3	83.1	86.2	85.0	77.1	91.5	85.4	81.1	84.3					
					Stdev	4.6	4.9	3.8	5.0	3.5	4.4	6.6	8.7	4.5	3.9					
	60	140	76	117	Normalized	100%	98%	103%	107%	105%	96%	113%	106%	101%	105%	x				
					% Rsd	5.7%	6.2%	4.5%	5.8%	4.1%	5.8%	7.2%	10.2%	5.5%	4.7%					

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)	Comment
Dehydronifedipine					**Average**	89.8	80.3	79.9	81.2	80.4	72.5	77.7	75.4	93.3	90.9					
					Stdev	4.5	5.0	6.0	5.2	6.9	4.0	4.6	4.5	6.3	3.7					
	60	140	82	127	Normalized	100%	89%	89%	90%	90%	81%	87%	84%	104%	101%	x				
					% Rsd	5.0%	6.2%	7.6%	6.4%	8.6%	5.5%	5.9%	6.0%	6.8%	4.1%					
DIA					**Average**	84.1	91.2	86.1	86.6	81.8	77.8	99.4	88.7	98.3	96.7					
					Stdev	12.0	8.9	10.1	18.6	11.0	9.6	9.3	12.1	9.5	15.0					
	60	140	90	111	Normalized	100%	108%	102%	103%	97%	92%	118%	105%	117%	115%	x				
					% Rsd	14.3%	9.7%	11.7%	21.4%	13.4%	12.3%	9.4%	13.7%	9.7%	15.5%					
Diazepam					**Average**	87.2	89.6	87.4	89.2	83.8	83.1	91.3	92.8	107.0	114.2					
					Stdev	3.2	1.7	4.5	5.6	4.2	4.2	3.9	7.5	5.8	4.4					
	60	140	86	116	Normalized	100%	103%	100%	102%	96%	95%	105%	106%	123%	131%	x				
					% Rsd	3.7%	1.9%	5.2%	6.3%	5.0%	5.0%	4.3%	8.1%	5.4%	3.8%					
Diclofenac- M-H					**Average**	96.3	99.5	100.4	101.4	94.4	77.2	105.7	102.8	127.4	104.2					
					Stdev	3.1	5.3	6.0	7.0	6.5	4.8	9.5	3.3	15.2	7.2					
	60	140	68	141	Normalized	100%	103%	104%	105%	98%	80%	110%	107%	132%	108%	x				
					% Rsd	3.2%	5.3%	6.0%	6.9%	6.9%	6.2%	9.0%	3.3%	11.9%	6.9%					
Dilantin - M-H					**Average**	96.0	90.8	89.5	96.5	109.0	82.1	105.2	93.0	131.9	104.3					
					Stdev	7.5	5.2	6.6	11.0	11.0	4.4	12.3	7.0	15.9	7.8					
	60	140	55	119	Normalized	100%	94%	93%	101%	114%	85%	109%	97%	137%	109%	x				
					% Rsd	7.8%	5.7%	7.4%	11.4%	10.1%	5.3%	11.7%	7.5%	12.1%	7.5%					
Diltiazem					**Average**	179.7	200.8	205.9	229.4	128.8	180.4	163.9	121.6	137.1	126.0					
					Stdev	9.7	12.8	9.0	10.1	9.7	10.9	12.6	12.0	13.1	6.9					
	60	140	74	126	Normalized	100%	112%	115%	128%	72%	100%	91%	68%	76%	70%	x				Continuing WSS did not match day 0; decrease is a calibration issue.
					% Rsd	5.4%	6.4%	4.4%	4.4%	7.5%	6.0%	7.7%	9.9%	9.6%	5.5%					
Diuron					**Average**	94.8	96.6	88.8	89.2	88.6	86.2	100.3	103.0	120.3	98.7					
					Stdev	2.2	3.3	3.6	4.8	4.1	2.2	3.6	4.3	12.6	4.5					
	60	140	75	131	Normalized	100%	102%	94%	94%	93%	91%	106%	109%	127%	104%	x				
					% Rsd	2.3%	3.4%	4.1%	5.4%	4.7%	2.6%	3.6%	4.2%	10.5%	4.6%					
Erythromycin					**Average**	110.2	171.3	147.0	161.8	78.5	203.2	144.8	96.3	103.1	82.0					
					Stdev	7.8	11.1	17.5	17.4	5.8	9.0	8.5	7.3	15.3	6.8					
	60	140	64	137	Normalized	100%	155%	133%	147%	71%	184%	131%	87%	94%	74%	x				Continuing WSS did not match day 0; drop is a Calibration issue
					% Rsd	7.1%	6.5%	11.9%	10.8%	7.5%	4.4%	5.9%	7.5%	14.9%	8.3%					

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)	Comment
Estrone					**Average**	107.8	102.4	106.3	127.7	95.0	82.9	96.6	104.0	112.3	90.1					
					Stdev	8.3	7.4	9.2	9.3	10.8	5.8	12.7	18.3	13.0	7.4					
	60	140	75	124	Normalized	100%	95%	99%	118%	88%	77%	90%	97%	104%	84%	x				
					% Rsd	7.7%	7.2%	8.7%	7.3%	11.4%	7.0%	13.2%	17.6%	11.6%	8.2%					
Ethylparaben					**Average**	105.5	107.5	106.3	108.3	100.1	110.4	112.5	110.2	149.1	123.4					
					Stdev	2.1	2.5	1.8	16.6	6.4	10.1	4.0	5.3	15.5	4.8					
	60	140	70	132	Normalized	100%	102%	101%	103%	95%	105%	107%	104%	141%	117%	x				Day 69 WSS biased high.
					% Rsd	2.0%	2.3%	1.7%	15.3%	6.4%	9.2%	3.6%	4.9%	10.4%	3.9%					
Flumequine					**Average**	107.9	104.8	103.7	108.6	97.2	96.5	107.1	119.0	131.6	138.8					
					Stdev	6.4	6.5	7.7	12.3	9.1	5.5	6.4	14.4	9.2	11.2					
	60	140	80	121	Normalized	100%	97%	96%	101%	90%	89%	99%	110%	122%	129%	x				
					% Rsd	5.9%	6.2%	7.5%	11.3%	9.4%	5.7%	6.0%	12.1%	7.0%	8.0%					
Fluoxetine					**Average**	150.2	178.7	207.9	217.5	67.0	195.4	76.0	87.7	85.3	86.8					
					Stdev	10.8	40.1	36.2	34.4	3.8	24.7	11.7	17.5	13.4	14.2					
	60	140	59	146	Normalized	100%	119%	138%	145%	45%	130%	51%	58%	57%	58%	x				Continuing WSS did not match day 0; drop is a calibration issue.
					% Rsd	7.2%	22.4%	17.4%	15.8%	5.6%	12.6%	15.4%	19.9%	15.7%	16.3%					
Gemfibrozil					**Average**	114.0	114.9	118.1	113.9	114.7	64.6	84.7	85.8	137.7	188.6					
					Stdev	6.5	3.9	3.6	8.7	28.0	3.6	4.0	15.7	4.9	22.0					
	60	140	68	137	Normalized	100%	101%	104%	100%	101%	57%	74%	75%	121%	165%	x				High bias on day 69 and 84 WSS.
					% Rsd	5.7%	3.4%	3.0%	7.7%	24.4%	5.6%	4.7%	18.3%	3.5%	11.6%					
Ibuprofen					**Average**	99.8	101.6	95.6	98.3	84.4	86.2	102.4	111.6	142.4	112.1					
					Stdev	3.2	2.2	3.3	6.8	10.3	3.4	4.1	5.5	15.5	3.5					
	60	140	62	140	Normalized	100%	102%	96%	98%	85%	86%	103%	112%	143%	112%	x				
					% Rsd	3.2%	2.2%	3.4%	6.9%	12.3%	4.0%	4.1%	5.0%	10.9%	3.1%					
Iohexol - M+H					**Average**	87.8	84.1	83.7	84.5	66.7	83.0	76.0	102.8	130.1	112.7					
					Stdev	15.8	10.8	12.7	16.1	6.4	9.4	7.3	9.8	27.7	11.6					
	60	140	72	158	Normalized	100%	96%	95%	96%	76%	95%	87%	117%	148%	128%	x				
					% Rsd	18.0%	12.8%	15.2%	19.1%	9.6%	11.3%	9.6%	9.6%	21.3%	10.3%					
Iopromide - PRM					**Average**	97.1	78.8	73.5	95.2	79.4	74.4	68.7	79.5	95.0	98.3					
					Stdev	7.3	11.5	9.1	17.7	12.2	7.0	8.5	26.3	9.5	8.9					
	60	140	59	164	Normalized	100%	81%	76%	98%	82%	77%	71%	82%	98%	101%	x				
					% Rsd	7.5%	14.6%	12.4%	18.6%	15.4%	9.4%	12.4%	33.1%	10.0%	9.1%					
Isobuylparaben					**Average**	96.5	98.0	97.0	98.0	92.0	98.2	121.0	106.7	146.0	115.4					

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)	Comment
					Stdev	3.3	3.5	2.8	7.4	3.1	4.3	4.5	3.8	16.9	4.2					
	60	140	68	129	Normalized	100%	102%	100%	102%	95%	102%	125%	111%	151%	120%	x				Day 69 WSS biased high.
					% Rsd	3.4%	3.6%	2.9%	7.5%	3.4%	4.3%	3.7%	3.5%	11.6%	3.6%					
Isoproturon					**Average**	109.4	100.4	97.2	97.2	113.9	98.6	106.7	94.3	117.9	122.1					
					Stdev	6.0	3.6	6.1	7.1	11.2	6.4	5.1	5.6	5.9	7.7					
	60	140	83	129	Normalized	100%	92%	89%	89%	104%	90%	98%	86%	108%	112%	x				
					% Rsd	5.5%	3.6%	6.3%	7.3%	9.8%	6.5%	4.8%	6.0%	5.0%	6.3%					
Ketoprofen					**Average**	75.8	69.7	62.2	74.1	82.4	54.0	65.9	76.4	79.0	80.4					
					Stdev	4.1	4.8	5.2	6.9	5.8	3.9	6.1	6.5	4.3	6.4					
	60	140	67	125	Normalized	100%	92%	82%	98%	109%	71%	87%	101%	104%	106%	x				
					% Rsd	5.4%	6.8%	8.4%	9.3%	7.0%	7.2%	9.3%	8.6%	5.5%	8.0%					
Ketorolac					**Average**	70.0	65.4	63.3	70.1	76.4	48.2	59.4	61.1	70.2	79.8					
					Stdev	5.5	4.6	4.1	5.2	9.3	4.1	4.0	6.7	4.3	5.7					
	60	140	70	129	Normalized	100%	94%	90%	100%	109%	69%	85%	87%	100%	114%	x				
					% Rsd	7.9%	7.0%	6.5%	7.3%	12.2%	8.4%	6.8%	10.9%	6.1%	7.1%					
Lidocaine					**Average**	100.3	102.2	95.8	116.9	96.3	77.3	106.1	91.0	74.4	100.2					
					Stdev	7.7	5.6	6.6	10.0	10.0	6.4	10.0	13.0	5.8	8.1					
	60	140	73	143	Normalized	100%	102%	96%	116%	96%	77%	106%	91%	74%	100%	x				
					% Rsd	7.7%	5.5%	6.8%	8.6%	10.4%	8.3%	9.4%	14.3%	7.8%	8.1%					
Lincomycin					**Average**	101.2	119.2	128.4	144.3	102.0	128.5	101.9	140.5	122.1	127.5					
					Stdev	18.5	25.8	20.9	26.4	15.0	18.6	11.8	22.9	14.0	11.5					
	60	140	55	153	Normalized	100%	118%	127%	143%	101%	127%	101%	139%	121%	126%	x				
					% Rsd	18.3%	21.7%	16.2%	18.3%	14.7%	14.5%	11.6%	16.3%	11.4%	9.0%					
Linuron					**Average**	90.9	88.3	91.2	85.7	82.5	75.3	91.3	105.0	139.2	107.1					
					Stdev	2.6	2.9	2.9	7.1	3.6	3.7	4.2	4.1	16.1	4.6					
	60	140	72	134	Normalized	100%	97%	100%	94%	91%	83%	100%	115%	153%	118%	x				day 69 WSS biased high
					% Rsd	2.9%	3.3%	3.1%	8.2%	4.4%	4.9%	4.6%	3.9%	11.6%	4.3%					
Lopressor-Metoprolol					**Average**	113.7	115.1	108.3	109.5	102.7	95.3	127.9	122.0	123.4	119.4					
					Stdev	6.5	4.8	6.1	8.6	5.7	5.5	5.8	9.9	15.3	8.0					
	60	140	78	141	Normalized	100%	101%	95%	96%	90%	84%	112%	107%	109%	105%	x				
					% Rsd	5.7%	4.2%	5.6%	7.8%	5.6%	5.8%	4.5%	8.1%	12.4%	6.7%					
Meclofenamic Acid					**Average**	96.3	96.9	99.7	102.3	94.5	77.1	105.7	102.8	127.4	104.3					
					Stdev	3.1	5.4	6.1	7.7	6.5	4.7	9.5	3.3	15.2	7.2					
	60	140	67	142	Normalized	100%	101%	103%	106%	98%	80%	110%	107%	132%	108%	x				

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability					
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016						
Days Since Spike						0	2	4	7	16	30	45	60	69	84						
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)		Comment
					% Rsd	3.2%	5.6%	6.1%	7.5%	6.9%	6.1%	9.0%	3.3%	11.9%	6.9%						
Meprobamate					**Average**	98.9	95.5	109.3	89.3	96.1	202.6	74.8	80.7	78.7	55.8						
					Stdev	15.9	19.4	24.7	25.4	21.6	38.0	15.7	15.7	10.0	15.1						
	60	140	76	144	Normalized	100%	97%	110%	90%	97%	205%	76%	82%	80%	56%	x					
					% Rsd	16.1%	20.3%	22.6%	28.4%	22.5%	18.8%	21.1%	19.5%	12.7%	27.1%						
Metazachlor					**Average**	70.7	64.2	52.2	52.1	35.5	15.6	9.7	4.7	4.5	-2.1						
					Stdev	4.0	2.3	2.7	4.8	3.2	1.1	0.7	0.9	0.7	0.3						
	60	140	76	131	Normalized	100%	91%	74%	74%	50%	22%	14%	7%	6%	-3%		x				degrades significantly in matrix after 15 days
					% Rsd	5.6%	3.6%	5.1%	9.1%	9.0%	7.3%	7.7%	18.5%	16.6%	-11.9%						
Metformin					**Average**	156.8	135.4	163.9	160.8	142.8	138.7	138.1	111.7	129.3	165.0						
					Stdev	26.6	21.4	38.2	38.0	15.4	23.6	18.2	30.5	18.7	19.1						
	60	140	58	143	Normalized	100%	86%	105%	103%	91%	88%	88%	71%	82%	105%	x					
					% Rsd	16.9%	15.8%	23.3%	23.6%	10.8%	17.0%	13.2%	27.3%	14.5%	11.6%						
Methylparaben - M-H					**Average**	124.3	124.2	115.7	119.4	117.2	113.6	141.3	122.4	159.2	118.5						
					Stdev	5.0	10.0	9.6	14.1	7.7	6.5	8.9	5.1	17.0	9.6						
	60	140	65	135	Normalized	100%	100%	93%	96%	94%	91%	114%	98%	128%	95%	x					
					% Rsd	4.0%	8.1%	8.3%	11.8%	6.6%	5.7%	6.3%	4.2%	10.7%	8.1%						
Metolachlor					**Average**	90.5	85.6	81.2	77.0	58.2	42.5	38.5	26.4	26.0	17.8						
					Stdev	4.7	3.1	2.8	5.1	2.6	2.0	1.9	1.8	1.3	0.9						
	60	140	89	114	Normalized	100%	95%	90%	85%	64%	47%	42%	29%	29%	20%		x				degrades after 15 days, but still present
					% Rsd	5.2%	3.7%	3.5%	6.6%	4.5%	4.6%	5.0%	6.8%	4.8%	5.1%						
Naproxen					**Average**	124.7	116.6	115.5	116.8	103.7	95.8	122.5	131.5	138.5	123.9						
					Stdev	5.2	6.3	8.4	12.1	9.6	6.8	13.3	8.6	19.9	13.3						
	60	140	75	127	Normalized	100%	94%	93%	94%	83%	77%	98%	105%	111%	99%	x					
					% Rsd	4.2%	5.4%	7.3%	10.3%	9.2%	7.1%	10.9%	6.5%	14.4%	10.8%						
Nifedipine					**Average**	106.1	123.9	125.7	165.0	157.8	103.9	180.5	142.5	260.0	137.6						
					Stdev	4.2	5.2	6.7	14.1	10.6	5.1	11.5	8.7	25.0	7.6						
	60	140	8	122	Normalized	100%	117%	118%	156%	149%	98%	170%	134%	245%	130%	x				x	Variability in WSS.
					% Rsd	3.9%	4.2%	5.3%	8.5%	6.7%	5.0%	6.4%	6.1%	9.6%	5.5%						
Nonyl-phenol					**Average**	117.1	216.6	235.2	284.6	84.0	172.7	210.5	144.8	161.0	138.5						
					Stdev	5.9	20.6	23.5	28.6	10.3	16.9	21.6	25.4	10.3	21.0						
	60	140	48	143	Normalized	100%	185%	201%	243%	72%	148%	180%	124%	138%	118%	x		x			Variability in WSS - semi quantitative.

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)	Comment
					% Rsd	5.1%	9.5%	10.0%	10.1%	12.3%	9.8%	10.3%	17.6%	6.4%	15.2%					
Norethisterone					**Average**	90.9	93.6	84.6	105.9	102.6	76.4	98.9	125.6	94.7	104.0					
					Stdev	8.5	5.0	6.5	20.1	15.9	6.4	7.0	52.3	8.4	8.1					
	60	140	72	146	Normalized	100%	103%	93%	117%	113%	84%	109%	138%	104%	114%	x				
					% Rsd	9.4%	5.3%	7.7%	18.9%	15.5%	8.4%	7.1%	41.6%	8.8%	7.8%					
Oxolinic Acid					**Average**	88.5	113.2	105.4	104.9	117.4	97.0	120.6	130.9	125.7	136.5					
					Stdev	7.1	5.1	11.1	10.3	13.0	6.3	6.6	9.5	8.7	7.2					
	60	140	71	145	Normalized	100%	128%	119%	119%	133%	110%	136%	148%	142%	154%	x				
					% Rsd	8.0%	4.5%	10.5%	9.8%	11.0%	6.5%	5.5%	7.3%	6.9%	5.3%					
Paraxanthine					**Average**	56.1	46.8	44.0	42.9	56.9	57.4	76.8	77.5	80.7	76.7					
					Stdev	6.5	4.3	4.6	7.5	4.9	9.1	8.0	21.7	8.5	12.2					
	60	140	70	120	Normalized	100%	83%	78%	76%	101%	102%	137%	138%	144%	137%	x				
					% Rsd	11.7%	9.1%	10.5%	17.6%	8.5%	15.9%	10.4%	28.0%	10.6%	15.9%					
Pentoxifylline					**Average**	61.2	80.5	71.2	70.2	74.7	56.1	92.4	63.3	76.3	74.2					
					Stdev	6.2	9.6	9.4	10.3	11.2	7.5	5.1	14.0	8.7	9.6					
	60	140	72	144	Normalized	100%	132%	116%	115%	122%	92%	151%	103%	125%	121%	x				
					% Rsd	10.2%	12.0%	13.3%	14.7%	15.0%	13.4%	5.5%	22.1%	11.4%	13.0%					
Phenazone					**Average**	110.8	115.4	113.6	109.2	115.4	86.9	118.0	92.1	87.9	102.7					
					Stdev	7.3	8.2	9.2	11.0	10.9	6.8	8.3	14.8	5.7	11.2					
	60	140	67	147	Normalized	100%	104%	102%	98%	104%	78%	106%	83%	79%	93%	x				
					% Rsd	6.6%	7.1%	8.1%	10.0%	9.4%	7.8%	7.1%	16.0%	6.5%	10.9%					
Primidone					**Average**	42.9	54.3	46.9	59.0	42.8	29.7	43.9	66.5	28.5	53.5					
					Stdev	10.4	7.4	4.0	8.3	9.2	6.2	8.0	11.3	3.9	7.7					
	60	140	64	146	Normalized	100%	126%	109%	138%	100%	69%	102%	155%	66%	125%	x				
					% Rsd	24.3%	13.6%	8.6%	14.1%	21.6%	20.8%	18.1%	17.1%	13.8%	14.4%					
Progesterone					**Average**	95.7	92.0	87.5	112.3	86.1	74.1	113.8	103.5	100.7	93.6					
					Stdev	9.2	8.2	8.9	11.3	6.6	6.9	12.1	12.6	7.9	10.1					
	60	140	71	143	Normalized	100%	96%	91%	117%	90%	77%	119%	108%	105%	98%	x				
					% Rsd	9.6%	8.9%	10.2%	10.1%	7.7%	9.2%	10.6%	12.2%	7.8%	10.8%					
Propazine					**Average**	95.9	91.6	86.8	87.9	96.2	79.1	91.4	89.3	118.1	99.7					
					Stdev	5.0	4.2	6.8	12.5	14.2	7.0	6.9	12.3	6.3	7.1					
	60	140	75	137	Normalized	100%	96%	90%	92%	100%	82%	95%	93%	123%	104%	x				
					% Rsd	5.2%	4.6%	7.9%	14.3%	14.7%	8.9%	7.5%	13.7%	5.3%	7.2%					
Propylparaben					**Average**	97.4	96.6	94.7	101.4	97.9	103.6	120.1	112.6	152.0	130.0					
					Stdev	2.4	3.5	3.6	6.9	6.1	3.0	3.8	8.0	16.4	7.3					

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability					
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016						
Days Since Spike						0	2	4	7	16	30	45	60	69	84						
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)		Comment
	60	140	68	136	Normalized	100%	99%	97%	104%	101%	106%	123%	116%	156%	133%	x					High bias in WSS from day 69.
					% Rsd	2.5%	3.6%	3.8%	6.8%	6.3%	2.9%	3.2%	7.1%	10.8%	5.6%						
Quinoline					**Average**	95.3	83.2	79.9	86.6	79.4	70.7	87.7	95.0	108.9	84.2						
					Stdev	8.4	5.3	6.3	7.7	3.8	7.1	4.1	7.4	6.1	4.5						
	60	140	85	115	Normalized	100%	87%	84%	91%	83%	74%	92%	100%	114%	88%	x					
					% Rsd	8.8%	6.4%	7.9%	8.8%	4.8%	10.0%	4.6%	7.8%	5.6%	5.4%						
Simazine					**Average**	108.0	115.8	106.6	101.8	98.5	96.8	111.1	99.1	107.5	115.1						
					Stdev	4.6	6.4	3.4	9.1	6.7	4.8	4.9	4.4	7.0	5.2						
	60	140	87	109	Normalized	100%	107%	99%	94%	91%	90%	103%	92%	100%	107%	x					
					% Rsd	4.3%	5.5%	3.2%	8.9%	6.8%	4.9%	4.4%	4.4%	6.5%	4.5%						
Sucralose - M-H					**Average**	209.8	162.6	143.6	146.2	164.7	150.9	257.6	167.2	180.1	232.2						
					Stdev	26.8	31.3	19.3	25.0	25.1	30.3	12.9	50.1	45.5	43.4						
	60	140	90	114	Normalized	100%	78%	68%	70%	79%	72%	123%	80%	86%	111%	x					
					% Rsd	12.8%	19.3%	13.5%	17.1%	15.2%	20.1%	5.0%	29.9%	25.2%	18.7%						
Sulfachloropyridazine					**Average**	25.2	27.9	30.3	19.5	45.3	23.6	33.8	21.9	49.3	28.1						
					Stdev	8.9	11.2	9.1	4.1	10.1	8.9	7.5	6.8	7.3	5.4						
	60	140	65	133	Normalized	100%	111%	120%	78%	180%	94%	134%	87%	196%	112%	x					
					% Rsd	35.4%	40.1%	30.1%	20.7%	22.4%	37.6%	22.2%	31.1%	14.8%	19.1%						
Sulfadiazine					**Average**	96.2	109.6	100.2	76.8	59.7	86.0	126.9	108.3	132.2	86.0						
					Stdev	20.3	55.0	36.8	26.2	27.5	36.0	48.6	14.4	21.8	23.6						
	60	140	85	121	Normalized	100%	114%	104%	80%	62%	89%	132%	113%	137%	89%	x					
					% Rsd	21.2%	50.2%	36.8%	34.2%	46.0%	41.9%	38.3%	13.3%	16.5%	27.4%						
Sulfadimethoxine					**Average**	108.8	126.0	126.3	112.1	100.4	86.3	90.9	78.3	117.9	107.6						
					Stdev	11.0	12.5	14.3	18.9	11.1	2.9	7.9	5.1	12.1	12.0						
	60	140	65	137	Normalized	100%	116%	116%	103%	92%	79%	84%	72%	108%	99%	x					
					% Rsd	10.1%	9.9%	11.3%	16.8%	11.0%	3.4%	8.7%	6.5%	10.3%	11.2%						
Sulfamerazine					**Average**	115.9	113.1	97.3	118.3	120.5	116.8	104.3	90.4	104.2	104.3						
					Stdev	32.5	36.1	27.0	42.3	40.6	47.7	60.5	31.5	40.0	53.2						
	60	140	71	135	Normalized	100%	98%	84%	102%	104%	101%	90%	78%	90%	90%	x					
					% Rsd	28.0%	31.9%	27.8%	35.8%	33.7%	40.8%	58.0%	34.9%	38.4%	51.0%						
Sulfamethazine					**Average**	124.3	124.6	128.0	96.6	138.6	131.6	118.0	90.9	89.3	133.6						
					Stdev	33.5	38.1	59.2	31.9	58.2	35.9	27.9	37.3	62.0	38.7						
	60	140	71	137	Normalized	100%	100%	103%	78%	112%	106%	95%	73%	72%	107%	x					
					% Rsd	26.9%	30.6%	46.2%	33.0%	42.0%	27.3%	23.6%	41.1%	69.5%	28.9%						
Sulfamethizole					**Average**	230.9	207.3	214.2	167.5	287.5	293.8	263.8	220.4	186.4	183.2						

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability				
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016					
Days Since Spike						0	2	4	7	16	30	45	60	69	84					
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study,J flag)	Comment
					Stdev	40.5	46.7	42.5	34.5	38.7	46.0	46.3	68.4	76.9	87.6					
	60	140	76	115	Normalized	100%	90%	93%	73%	125%	127%	114%	95%	81%	79%	x				
					% Rsd	17.5%	22.5%	19.8%	20.6%	13.4%	15.7%	17.5%	31.0%	41.2%	47.8%					
Sulfamethoxazole					**Average**	88.8	90.3	88.9	88.2	87.3	65.1	82.6	84.3	90.2	89.2					
					Stdev	11.1	12.8	9.9	13.6	14.2	6.3	12.6	9.6	6.3	11.6					
	60	140	93	108	Normalized	100%	102%	100%	99%	98%	73%	93%	95%	102%	100%	x				
					% Rsd	12.5%	14.2%	11.2%	15.4%	16.2%	9.7%	15.2%	11.4%	7.0%	13.0%					
Sulfathiazole					**Average**	70.2	67.8	60.4	70.7	67.8	54.0	57.9	85.8	105.2	80.7					
					Stdev	9.2	7.5	7.4	15.2	10.4	11.0	16.1	13.7	14.0	15.3					
	60	140	62	133	Normalized	100%	97%	86%	101%	97%	77%	82%	122%	150%	115%	x				
					% Rsd	13.1%	11.1%	12.3%	21.5%	15.4%	20.4%	27.7%	16.0%	13.3%	18.9%					
Sulfometuron methyl					**Average**	54.2	46.9	50.1	42.9	54.7	46.1	56.7	60.1	82.1	85.3					
					Stdev	3.4	3.2	3.8	2.7	4.0	2.9	3.9	10.6	6.7	3.3					
	60	140	65	122	Normalized	100%	86%	92%	79%	101%	85%	104%	111%	151%	157%	x				High bias in some WSS.
					% Rsd	6.4%	6.8%	7.6%	6.2%	7.2%	6.3%	6.8%	17.6%	8.2%	3.9%					
TCEP					**Average**	65.5	72.1	68.7	67.5	48.0	49.1	65.9	81.2	87.4	103.6					
					Stdev	8.4	5.4	5.1	5.4	7.4	7.1	23.3	4.9	9.6	8.9					
	60	140	71	124	Normalized	100%	110%	105%	103%	73%	75%	101%	124%	134%	158%	x				
					% Rsd	12.8%	7.5%	7.5%	8.1%	15.3%	14.4%	35.4%	6.0%	11.0%	8.6%					
TCPP					**Average**	88.3	96.1	95.2	106.3	135.2	100.2	143.6	185.9	201.9	101.8					
					Stdev	7.1	7.6	7.4	13.9	22.3	13.3	13.9	212.8	36.7	7.8					
	40	160	18	203	Normalized	100%	109%	108%	120%	153%	113%	163%	210%	228%	115%	x				
					% Rsd	8.0%	7.9%	7.8%	13.1%	16.5%	13.3%	9.7%	114.5%	18.2%	7.7%					
TDCPP - PRM					**Average**	77.9	55.4	64.9	57.2	53.4	43.6	44.0	70.4	70.1	47.2					
					Stdev	10.9	6.5	6.6	17.8	6.7	5.4	4.5	10.1	7.7	6.8					
	40	160	26	171	Normalized	100%	71%	83%	73%	69%	56%	56%	90%	90%	61%	x				
					% Rsd	14.0%	11.8%	10.1%	31.1%	12.6%	12.4%	10.1%	14.4%	11.0%	14.4%					
Testosterone					**Average**	103.0	105.5	103.2	106.5	81.1	82.1	88.2	111.2	99.5	81.4					
					Stdev	7.9	8.7	7.7	6.6	5.8	5.4	5.5	17.8	6.2	3.2					
	60	140	71	127	Normalized	100%	102%	100%	103%	79%	80%	86%	108%	97%	79%	x				
					% Rsd	7.6%	8.3%	7.4%	6.2%	7.2%	6.6%	6.2%	16.0%	6.2%	4.0%					
Theobromine					**Average**	60.1	70.9	70.4	80.2	79.2	81.5	79.8	125.9	111.1	120.5					
					Stdev	10.5	13.8	18.4	18.3	12.1	12.7	34.0	159.3	8.9	12.9					
	60	140	55	139	Normalized	100%	118%	117%	133%	132%	135%	133%	209%	185%	200%	x				
					% Rsd	17.5%	19.5%	26.1%	22.7%	15.3%	15.6%	42.6%	126.5%	8.0%	10.7%					

Working Stock Standard ID						WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16	EEA conclusions regarding stability						
Analytical Date						7/1/2016	7/3/2016	7/5/2016	7/8/2016	7/17/2016	7/31/2016	8/15/2016	8/30/2016	9/7/2016	9/21/2016							
Days Since Spike						0	2	4	7	16	30	45	60	69	84							
	EEA Method LCS Lower Limit (%)	EEA Method LCS Upper Limit (%)	Study LCS Lower Limit (%)	Study LCS Upper Limit (%)												Stable, Most Results Within LCS Limits During Full Study Period, Fully Quantitative Results, No QC Flag	Stable With Degradation Occuring After 2 Weeks, QC "R" QC Flag Results After Degradation Starts	Results Highly Variable, Semi-Quantitative, Recommend "J" QC Flag All Results as Estimates	Results Often Outside LCS Limits, But No Degradation or Extreme Variability (Possible Matrix or Calibration Artifact in HT study, J flag)		Comment
Theophyline					**Average**	40.9	49.8	70.0	38.5	84.0	185.3	236.2	263.0	132.9	165.7						
					Stdev	10.6	13.4	12.2	11.2	18.6	36.2	77.4	103.9	13.9	15.4						
	60	140	56	132	Normalized	100%	122%	171%	94%	205%	453%	577%	643%	325%	405%	x			x		WSS high bias after day 0 WSS.
					% Rsd	25.8%	27.0%	17.5%	29.2%	22.1%	19.5%	32.8%	39.5%	10.5%	9.3%						
Thiabendazole					**Average**	85.6	92.1	97.7	98.4	98.0	35.0	100.6	82.1	102.7	96.1						
					Stdev	8.4	7.6	5.3	8.0	5.5	2.3	5.4	7.4	4.2	6.2						
	60	140	81	119	Normalized	100%	108%	114%	115%	114%	41%	118%	96%	120%	112%	x					
					% Rsd	9.8%	8.3%	5.4%	8.2%	5.7%	6.6%	5.4%	9.0%	4.1%	6.4%						
Triclocarban					**Average**	130.3	109.1	103.3	112.9	66.8	59.2	82.3	58.0	89.5	56.9						
					Stdev	8.8	5.7	6.1	4.7	4.9	4.4	9.3	5.1	13.1	5.5						
	60	140	61	148	Normalized	100%	84%	79%	87%	51%	45%	63%	45%	69%	44%	x					Continuing WSS did not match day 0 WSS, decrease due to calibration.
					% Rsd	6.8%	5.2%	5.9%	4.2%	7.4%	7.4%	11.4%	8.8%	14.6%	9.6%						
Triclosan					**Average**	113.1	121.0	111.4	151.4	90.4	104.8	130.5	100.3	139.0	100.3						
					Stdev	3.5	3.9	3.8	4.3	4.8	6.9	6.8	5.2	13.8	5.6						
	60	140	33	131	Normalized	100%	107%	99%	134%	80%	93%	115%	89%	123%	89%		x				
					% Rsd	3.1%	3.2%	3.4%	2.8%	5.3%	6.5%	5.2%	5.2%	9.9%	5.6%						
Trimethoprim					**Average**	90.8	85.4	91.3	87.7	84.1	69.4	88.7	94.3	94.0	93.2						
					Stdev	4.9	4.7	8.6	9.6	7.0	4.4	9.1	5.9	7.4	3.2						
	60	140	82	116	Normalized	100%	94%	101%	97%	93%	77%	98%	104%	104%	103%		x				
					% Rsd	5.4%	5.5%	9.5%	10.9%	8.3%	6.4%	10.3%	6.3%	7.9%	3.4%						
Warfarin					**Average**	124.8	126.6	126.8	135.7	115.8	118.7	171.1	145.5	193.7	154.4						
					Stdev	3.7	5.0	6.6	5.7	5.7	5.5	14.5	7.2	22.2	15.0						
	60	140	50	128	Normalized	100%	101%	102%	109%	93%	95%	137%	117%	155%	124%		x				
					% Rsd	3.0%	3.9%	5.2%	4.2%	4.9%	4.6%	8.5%	5.0%	11.4%	9.7%						

Table 2. Laboratory Control Sample Results

Sample	Working Stock Standard ID Analytical Date Days Since Spike Compound	WSS 06-30-16 7/1/2016 0	WSS 06-30-16 7/3/2016 2	WSS 06-30-16 7/5/2016 4	WSS 06-30-16 7/8/2016 7	WSS 07-15-16 7/17/2016 16	WSS-07-25-16 7/31/2016 30	WSS 08-15-16 8/15/2016 45	WSS 08-29-16 8/30/2016 60	WSS 09-07-16 9/7/2016 69	WSS-09-21-16 9/21/2016 84	Average	St. Dev.	3x St. Dev.	Lower Control Limit (Average Minus 3x St. Dev.)	Upper Control Limit (Average Plus 3x St. Dev.)
LCS1	17alpha ethynylestradiol - M-H	105.9	103.1	98.3	108.8	96.2	103.4	96.3	102.5	127.1	86.5	105.3	11.0	33.0	72.3	138.3
LCS2	17alpha ethynylestradiol - M-H	96.2	98.7	96.7	101.8	108.0	118.0	109.6	126.0	124.4	99.4					
LCS1	17B-Estradiol - M-H	109.1	101.2	101.8	105.3	92.6	100.5	103.3	105.1	121.3	92.0	105.7	11.3	33.8	71.9	139.5
LCS2	17B-Estradiol - M-H	102.2	100.3	92.8	111.0	105.0	99.5	111.4	126.1	136.3	97.3					
LCS1	2,4-D	102.7	66.8	98.9	103.5	96.5	94.5	98.4	98.2	128.8	90.6	97.1	14.5	43.4	53.7	140.5
LCS2	2,4-D	97.3	62.8	90.3	98.8	96.9	98.4	101.1	104.3	121.7	91.7					
LCS1	4-tert-OctylphenoL	84.9	86.8	79.9	112.2	87.7	88.2	82.5	100.6	109.2	90.4	90.2	10.4	31.1	59.1	121.3
LCS2	4-tert-OctylphenoL	68.8	89.5	82.9	101.2	90.3	78.5	87.5	98.3	95.7	88.9					
LCS1	Acesulfame	98.2	100.5	99.9	109.7	104.3	100.2	99.1	103.0	99.2	102.6	101.5	3.0	8.9	92.5	110.4
LCS2	Acesulfame	100.2	99.7	102.6	106.3	99.9	101.7	103.4	98.6	97.3	102.6					
LCS1	Acetaminophen	93.4	101.7	101.8	104.2	96.5	96.9	95.7	100.7	101.4	89.1	98.2	4.8	14.5	83.7	112.8
LCS2	Acetaminophen	90.4	99.9	97.8	101.3	106.5	96.7	96.7	102.9	101.4	89.6					
LCS1	Albuterol	79.2	117.8	85.9	99.3	122.7	91.9	96.8		61.2	63.0	89.8	21.9	65.8	24.0	155.6
LCS2	Albuterol	88.4	101.9	73.1	105.0	98.6	64.0	134.3		70.0	62.9					
LCS1	Amoxicilin	95.6	102.6	98.0	100.5	75.2	104.5	98.9	98.2	122.9	88.6	103.9	14.2	42.6	61.3	146.6
LCS2	Amoxicilin	97.5	106.2	100.1	110.2	128.8	92.6	113.4	99.6	139.8	105.7					
LCS1	Andorostenedione	126.5	88.7	99.5	114.6	92.0	96.9	128.1	97.8	95.2	109.6	101.0	12.7	38.2	62.7	139.2
LCS2	Andorostenedione	100.0	86.9	87.2	100.5	123.8	93.4	98.3	95.5	91.8	93.4					
LCS1	Atenolol	123.8	94.4	107.2	118.1	89.6	76.6	100.6	107.6	100.6	107.8	102.4	11.8	35.4	67.0	137.8
LCS2	Atenolol	118.5	98.3	107.0	113.8	98.0	98.7	87.1	101.5	88.2	110.6					
LCS1	Atrazine	97.3	112.2	99.6	109.5	97.8	98.0	95.2	92.4	100.1	102.2	101.6	6.6	19.8	81.8	121.4
LCS2	Atrazine	105.9	101.3	100.9	102.2	113.7	97.1	105.9	86.8	106.1	107.1					
LCS1	Bendroflumethiazide - M-H	103.7	97.3	97.7	107.3	83.7	94.2	90.2	99.3	85.0	103.9	94.6	7.0	21.1	73.6	115.7
LCS2	Bendroflumethiazide - M-H	94.4	91.2	95.4	106.2	89.7	90.1	93.8	93.9	83.0	92.6					
LCS1	Bezafibrate	96.4	92.9	98.8	106.8	87.9	92.4	85.6	98.3	106.7	112.3	100.0	8.8	26.4	73.6	126.4
LCS2	Bezafibrate	96.0	102.6	103.5	118.7	98.0	92.1	107.1	96.6	113.7	93.0					
LCS1	Bisphenol A	101.7	100.4	98.1	109.4	99.9	98.5	100.1	100.1	97.6	95.6	100.3	3.4	10.1	90.3	110.4
LCS2	Bisphenol A	101.0	102.2	103.3	106.1	101.4	98.2	101.0	99.9	95.9	96.0					
LCS1	Bromacil	99.4	92.0	94.8	101.9	88.7	92.7	101.0	83.9	91.7	98.1	95.2	5.4	16.2	79.0	111.5
LCS2	Bromacil	97.2	97.1	98.2	98.7	85.5	92.3	104.2	92.7	93.5	101.0					
LCS1	Clofibric acid	105.0	101.1	98.2	99.7	97.7	99.7	94.9	95.7	132.8	92.8	102.0	9.0	27.1	74.9	129.2
LCS2	Clofibric acid	102.2	100.0	94.6	93.8	99.4	98.7	103.6	107.8	115.1	107.7					
LCS1	Butalbital	100.4	99.2	103.3	111.9	85.6	93.0	91.5	90.6	94.9	88.7	95.5	6.7	20.2	75.3	115.6
LCS2	Butalbital	92.9	103.2	98.6	105.3	96.2	90.6	88.9	94.7	90.2	90.3					
LCS1	Butylparaben-NEG	98.2	94.8	101.5	96.5	88.9	96.0	93.8	99.6	124.3	96.4	98.7	10.1	30.4	68.2	129.1
LCS2	Butylparaben-NEG	95.8	91.6	87.1	97.6	95.1	84.7	103.1	113.9	120.3	94.6					
LCS1	Caffeine	99.6	98.1	99.3	114.8	104.3	99.9	103.2	92.4	102.3	101.6	103.6	5.9	17.6	86.0	121.2
LCS2	Caffeine	106.5	100.8	104.7	115.6	112.1	101.3	104.8	96.4	105.6	108.1					
LCS1	Carbadox	109.5	91.6	100.0	107.6	87.8	73.5	101.0	99.3	141.8	95.2	100.4	13.0	39.1	61.3	139.6
LCS2	Carbadox	101.0	93.7	99.5	102.8	96.2	94.3	95.0	109.9	112.9	96.1					
LCS1	Carbamazepine	96.5	95.1	105.9	112.5	103.4	93.9	100.4	96.6	105.8	90.1	99.3	6.2	18.5	80.7	117.8
LCS2	Carbamazepine	103.8	98.1	99.8	102.6	105.8	98.8	97.9	85.1	99.2	94.5					
LCS1	Carisoprodol	98.6	101.6	107.3	117.7	103.0	106.5	81.2	100.3	98.6	127.6	95.8	14.4	43.1	52.7	138.8
LCS2	Carisoprodol	94.5	79.6	91.1	80.3	110.8	85.9	75.6	97.7	79.8	77.7					
LCS1	Chloramphenicol_M-H	99.8	103.5	89.5	108.2	92.2	101.0	103.5	104.7	128.3	103.5	100.1	11.3	33.9	66.2	134.0
LCS2	Chloramphenicol_M-H	82.0	91.7	82.6	96.4	100.7	93.8	102.1	110.9	118.3	89.0					
LCS1	Chloridazon	101.7	98.9	102.7	106.5	88.7	94.8	94.2	88.4	97.1	108.0	97.9	7.5	22.5	75.4	120.4
LCS2	Chloridazon	92.9	99.5	101.0	98.4	85.6	94.4	102.2	89.5	96.7	116.9					

Sample	Working Stock Standard ID Analytical Date Days Since Spike Compound	WSS 06-30-16 7/1/2016 0	WSS 06-30-16 7/3/2016 2	WSS 06-30-16 7/5/2016 4	WSS 06-30-16 7/8/2016 7	WSS 07-15-16 7/17/2016 16	WSS-07-25-16 7/31/2016 30	WSS 08-15-16 8/15/2016 45	WSS 08-29-16 8/30/2016 60	WSS 09-07-16 9/7/2016 69	WSS-09-21-16 9/21/2016 84	Average	St. Dev.	3x St. Dev.	Lower Control Limit (Average Minus 3x St. Dev.)	Upper Control Limit (Average Plus 3x St. Dev.)
LCS1	Chlorotoluron	105.7	97.3	95.2	108.5	84.7	94.4	92.6	99.4	92.3	107.8	99.3	8.0	24.0	75.3	123.3
LCS2	Chlorotoluron	112.0	99.0	103.4	113.5	91.6	91.5	105.8	102.0	88.7	101.3					
LCS1	Cimetidine - PRM	119.0	109.2	105.7	99.2	79.3		103.7	103.5	120.3	104.2	101.9	10.4	31.2	70.7	133.2
LCS2	Cimetidine - PRM	96.7	111.8	96.7	101.4	103.9		82.7	104.4	99.8	93.2					
LCS1	Cotinine - PRM	94.7	99.2	106.4	115.5	101.7	91.9	100.7	98.6	103.4	89.6	97.7	7.5	22.5	75.2	120.2
LCS2	Cotinine - PRM	90.3	98.5	105.9	104.3	96.3	89.6	94.7	93.7	97.0	81.9					
LCS1	Cyanazine	99.0	98.7	100.5	109.5	101.4	101.2	96.9	102.6	98.9	97.7	99.9	3.9	11.7	88.2	111.6
LCS2	Cyanazine	94.9	99.0	98.7	104.7	99.2	95.2	103.0	92.7	98.4	105.6					
LCS1	DACT	104.0	104.4	98.5	110.8	87.8	99.3	107.2	99.1	97.9	115.7	94.7	11.2	33.6	61.1	128.3
LCS2	DACT	89.0	83.9	89.3	91.3	96.0	92.7	82.8	97.0	72.9	74.3					
LCS1	DEA	100.2	105.9	104.2	107.8	96.5	97.8	96.2	102.0	96.6	109.8	101.2	5.2	15.6	85.6	116.8
LCS2	DEA	98.7	106.1	103.1	101.2	95.5	93.2	106.9	95.4	97.1	109.7					
LCS1	DEET	104.6	109.6	103.8	110.2	93.8	96.1	93.0	88.0	94.8	100.2	96.3	6.8	20.5	75.8	116.8
LCS2	DEET	95.1	94.8	98.4	100.3	96.6	90.7	91.8	87.3	86.1	91.3					
LCS1	Dehydronifedipine	107.2	94.0	96.4	110.1	96.9	96.9	114.0	100.1	100.2	96.4	104.3	7.5	22.5	81.8	126.8
LCS2	Dehydronifedipine	122.8	100.9	107.1	109.7	110.4	108.3	107.4	94.8	105.9	107.2					
LCS1	DIA	100.1	101.2	101.3	109.2	98.9	101.9	99.5	102.5	95.7	98.8	100.4	3.5	10.6	89.7	111.0
LCS2	DIA	94.3	103.1	103.0	101.5	99.8	102.1	100.6	103.5	93.8	96.5					
LCS1	Diazepam	99.5	102.3	100.8	111.5	92.8	98.1	96.9	98.9	99.6	105.1	101.1	4.9	14.8	86.3	115.9
LCS2	Diazepam	101.4	106.5	102.1	107.0	97.1	99.1	95.0	105.3	94.7	108.5					
LCS1	Diclofenac- M-H	98.5	98.1	98.7	104.8	92.2	97.7	100.1	108.2	137.3	105.6	104.3	12.2	36.7	67.6	141.1
LCS2	Diclofenac- M-H	97.2	96.1	97.9	101.8	98.4	100.3	104.2	104.7	139.1	105.4					
LCS1	Dilantin - M-H	82.5	95.1	87.8	104.5	79.0	81.1	95.1	102.5	97.2	97.9	86.8	10.6	31.7	55.1	118.5
LCS2	Dilantin - M-H	75.8	81.1	77.1	86.8	69.9	68.9	98.7	82.3	80.9	92.4					
LCS1	Diltiazem	107.8	84.2	106.9	106.4	92.9	96.7	92.4	88.9	95.3	112.7	100.1	8.6	25.7	74.3	125.8
LCS2	Diltiazem	108.0	94.0	103.5	117.2	103.2	94.2	94.2	101.6	94.5	107.3					
LCS1	Diuron	111.4	100.0	100.1	105.7	92.0	98.1	97.6	101.5	127.1	98.1	102.8	9.3	27.8	75.1	130.6
LCS2	Diuron	100.9	100.8	91.5	105.7	95.5	97.3	99.0	111.6	123.3	99.2					
LCS1	Erythromycin	97.7	78.4	99.4	91.0	104.0	95.4	82.8	95.0	120.4	108.5	100.8	12.1	36.3	64.5	137.0
LCS2	Erythromycin	100.3	85.2	96.8	108.7	118.5	96.8	96.2	110.7	123.9	105.5					
LCS1	Estrone	96.3	97.9	100.9	111.9	103.5	97.2	87.2	110.6	88.6	98.6	99.7	8.1	24.4	75.3	124.0
LCS2	Estrone	104.4	95.3	100.5	111.9	97.4	95.0	99.6	101.8	112.3	82.8					
LCS1	Ethylparaben	100.2	93.3	93.7	100.2	90.9	98.5	93.0	103.5	130.1	94.8	101.1	10.4	31.3	69.7	132.4
LCS2	Ethylparaben	96.1	92.1	95.4	104.0	98.4	93.3	105.9	117.1	121.0	99.8					
LCS1	Flumequine	97.6	91.9	92.0	109.6	95.4	93.4	96.2	98.6	112.4	94.6	100.4	6.9	20.7	79.7	121.0
LCS2	Flumequine	105.0	98.8	103.1	105.4	100.8	95.9	104.7	91.0	112.4	108.6					
LCS1	Fluoxetine	110.8	97.3	108.1	113.4	95.6	97.8	67.3	97.8	101.1	99.0	102.5	14.4	43.2	59.3	145.8
LCS2	Fluoxetine	113.7	111.9	109.7	106.4	97.1	113.8	70.3	116.4	95.5	127.9					
LCS1	Gemfibrozil	104.6	101.7	105.6	101.2	108.8	93.8	98.6	99.5	83.4	111.6	102.2	11.5	34.6	67.6	136.8
LCS2	Gemfibrozil	107.5	101.3	100.7	108.3	139.8	92.5	107.9	97.4	87.5	93.1					
LCS1	Ibuprofen	100.2	106.8	94.1	103.0	87.0	100.1	91.8	102.5	135.6	91.5	100.6	13.0	38.9	61.7	139.5
LCS2	Ibuprofen	100.1	97.9	93.0	107.7	80.4	96.2	95.8	107.2	129.6	91.4					
LCS1	Iohexol - M+H	132.2	95.6	100.1	117.6	85.6	108.8	103.2	120.7	138.5	107.9	114.6	14.3	42.9	71.7	157.5
LCS2	Iohexol - M+H	127.7	115.0	126.2	117.0	113.4	97.1	102.4	127.4	132.1	124.3					
LCS1	Iopromide - PRM	103.0	93.1	102.8	110.3	94.3	86.0	108.9	88.7	103.1	87.3	111.2	17.4	52.3	58.9	163.5
LCS2	Iopromide - PRM	127.1	136.0	136.6	131.5	131.3	111.7	123.7	95.2	123.3	130.2					
LCS1	Isobuylparaben	98.2	94.9	101.7	96.5	88.8	96.0	93.8	99.7	124.3	96.3	98.7	10.2	30.5	68.2	129.1
LCS2	Isobuylparaben	95.8	91.7	87.1	97.5	95.0	84.8	103.1	113.9	120.3	94.5					
LCS1	isoproturon	101.4	108.7	98.2	109.9	99.8	97.1	106.3	98.9	106.7	96.1	105.9	7.6	22.8	83.1	128.8
LCS2	isoproturon	121.7	111.6	113.3	111.8	116.9	103.3	113.3	92.4	106.1	105.1					
LCS1	Ketoprofen	95.4	101.7	94.9	115.3	108.2	93.2	104.8	100.3	103.3	105.6	95.9	9.5	28.6	67.3	124.5

Sample	Compound	Working Stock Standard ID Analytical Date Days Since Spike	WSS 06-30-16 7/1/2016 0	WSS 06-30-16 7/3/2016 2	WSS 06-30-16 7/5/2016 4	WSS 06-30-16 7/8/2016 7	WSS 07-15-16 7/17/2016 16	WSS-07-25-16 7/31/2016 30	WSS 08-15-16 8/15/2016 45	WSS 08-29-16 8/30/2016 60	WSS 09-07-16 9/7/2016 69	WSS-09-21-16 9/21/2016 84	Average	St. Dev.	3x St. Dev.	Lower Control Limit (Average Minus 3x St. Dev.)	Upper Control Limit (Average Plus 3x St. Dev.)
LCS2	Ketoprofen		93.7	81.2	79.1	87.6	104.6	97.2	86.6	86.4	90.3	88.4					
LCS1	Ketorolac		98.5	101.4	94.3	112.9	107.7	89.6	107.6	96.0	98.4	107.9	99.7	9.8	29.5	70.2	129.2
LCS2	Ketorolac		93.9	91.5	90.8	93.4	120.0	97.3	89.7	87.1	95.4	119.9					
LCS1	Lidocaine		100.3	101.6	94.9	110.2	101.1	96.8	104.0	100.3	94.0	105.3	108.0	11.8	35.3	72.7	143.3
LCS2	Lidocaine		123.0	115.4	106.3	115.1	125.0	102.5	119.6	102.6	101.7	140.3					
LCS1	Lincomycin		99.4	90.1	99.1	108.5	81.6	89.2	86.7	91.1	115.6	108.5	103.8	16.4	49.1	54.8	152.9
LCS2	Lincomycin		106.9	100.6	104.9	106.6	121.2	95.4	96.6	94.0	152.7	127.7					
LCS1	Linuron		104.0	99.3	105.7	104.4	93.4	101.3	89.3	104.4	127.2	96.6	102.9	10.4	31.2	71.7	134.1
LCS2	Linuron		104.7	94.7	101.5	98.3	97.1	100.8	94.6	112.4	131.2	97.3					
LCS1	Lopressor-Metoprolol		112.9	103.7	100.7	104.3	94.6	109.0	97.4	110.8	125.9	125.3	109.9	10.5	31.5	78.3	141.4
LCS2	Lopressor-Metoprolol		116.2	111.5	97.2	109.5	98.5	106.3	104.9	120.9	114.7	132.9					
LCS1	Meclofenamic Acid		98.4	96.2	97.6	107.0	92.4	97.4	100.1	108.3	137.3	105.7	104.1	12.5	37.5	66.6	141.6
LCS2	Meclofenamic Acid		97.2	92.7	97.5	102.4	98.5	100.1	104.2	104.7	139.1	105.5					
LCS1	Meprobamate		102.4	93.4	95.4	114.0	110.9	92.5	104.3	99.4	101.2	111.6	110.0	11.2	33.7	76.3	143.7
LCS2	Meprobamate		121.1	116.9	119.4	126.4	133.5	110.9	123.7	104.7	108.6	110.2					
LCS1	Metazachlor		91.5	100.7	94.8	112.8	98.6	94.4	105.1	92.0	104.7	115.2	103.4	9.2	27.6	75.7	131.0
LCS2	Metazachlor		111.2	106.3	93.9	105.2	114.1	101.0	110.1	87.8	106.1	122.0					
LCS1	Metformin		90.1	87.4	105.4	112.9	120.3	88.1	101.0	106.4	110.4	112.5	100.8	14.2	42.7	58.0	143.5
LCS2	Metformin		110.8	72.4	81.2	116.5	103.6	80.8	122.6	91.2	94.4	107.0					
LCS1	Methylparaben - M-H		96.7	97.1	93.4	105.9	89.1	93.2	92.5	99.9	127.8	91.1	100.0	11.7	35.2	64.8	135.2
LCS2	Methylparaben - M-H		97.0	96.3	85.9	107.6	99.9	90.3	107.3	113.7	126.4	88.9					
LCS1	Metolachlor		105.0	101.0	104.1	108.2	95.3	102.8	102.9	105.7	100.8	96.6	101.5	4.1	12.4	89.1	113.9
LCS2	Metolachlor		107.5	100.8	104.3	105.2	102.9	98.1	100.7	98.4	94.2	95.1					
LCS1	Naproxen		106.8	95.1	98.0	107.5	91.0	89.9	99.8	102.4	123.1	93.0	100.6	8.7	26.1	74.6	126.7
LCS2	Naproxen		99.2	92.2	97.5	103.2	102.2	90.8	96.8	109.8	116.3	98.5					
LCS1	Nifedipine		36.2	80.4	72.9	91.8	52.5	70.1	71.6	86.0	85.2	89.4	64.9	19.0	57.0	7.8	121.9
LCS2	Nifedipine		28.4	53.4	50.3	54.8	42.6	41.7	63.5	85.9	73.5	66.8					
LCS1	Nonyl-phenol		72.9	86.1	101.1	111.9	98.5	69.5	76.9	96.9	107.8	84.4	95.6	15.9	47.6	48.0	143.2
LCS2	Nonyl-phenol		71.5	85.0	113.0	112.7	93.3	97.1	118.9	98.7	122.3	93.3					
LCS1	Norethisterone		95.5	103.4	93.0	106.5	92.3	104.4	96.2	107.9	108.6	97.2	109.1	12.4	37.3	71.8	146.4
LCS2	Norethisterone		106.2	110.1	102.8	117.7	138.7	124.1	124.8	126.7	109.2	116.8					
LCS1	Oxolinic Acid		100.4	101.9	95.5	112.7	100.1	92.2	98.8	90.0	105.4	95.1	108.0	12.3	37.0	71.0	145.0
LCS2	Oxolinic Acid		128.4	116.5	123.7	121.6	120.3	101.2	121.2	95.6	115.9	122.7					
LCS1	Paraxanthine		101.6	93.7	93.2	104.9	101.8	94.7	100.1	103.9	94.1	86.1	94.9	8.2	24.7	70.1	119.6
LCS2	Paraxanthine		84.7	86.6	88.2	86.3	92.7	111.2	108.9	91.0	86.7	86.7					
LCS1	Pentoxifylline		90.6	104.1	97.8	110.4	97.4	94.7	106.8	92.6	107.5	102.4	107.8	12.1	36.3	71.5	144.1
LCS2	Pentoxifylline		122.8	115.9	108.3	122.6	101.6	103.9	132.2	96.5	124.7	123.9					
LCS1	Phenazone		102.6	100.2	95.0	105.6	95.4	93.7	98.1	94.3	94.7	98.7	107.2	13.3	39.9	67.3	147.1
LCS2	Phenazone		135.1	128.2	118.1	120.2	117.8	104.9	123.5	94.0	101.8	122.9					
LCS1	Primidone		99.8	97.9	89.2	122.3	100.0	108.3	124.3	103.2	89.7	111.4	105.1	13.5	40.6	64.5	145.6
LCS2	Primidone		91.3	109.1	86.2	103.8	129.7	96.7	126.0	117.2	86.9	108.2					
LCS1	Progesterone		116.2	91.7	99.3	111.2	107.7	103.6	127.6	109.7	99.2	107.7	107.1	11.9	35.7	71.4	142.9
LCS2	Progesterone		100.4	103.9	101.9	117.6	108.4	85.2	139.7	105.6	106.9	99.3					
LCS1	Propazine		96.4	101.3	102.9	108.0	102.3	94.9	100.6	99.4	102.7	92.2	106.1	10.2	30.7	75.5	136.8
LCS2	Propazine		113.6	115.6	113.8	116.3	131.9	95.1	121.1	97.0	106.0	111.2					
LCS1	Propylparaben		100.0	95.8	97.0	103.5	90.9	99.0	91.2	98.9	126.9	97.7	102.2	11.3	33.9	68.3	136.1
LCS2	Propylparaben		98.2	95.9	86.9	106.4	102.4	95.1	106.1	117.3	131.4	103.6					
LCS1	Quinoline		100.2	100.8	105.7	114.8	103.5	93.5	94.3	103.1	101.1	100.2	100.2	4.9	14.7	85.5	114.9
LCS2	Quinoline		104.7	95.4	102.5	95.9	99.3	98.9	96.5	100.6	95.8	97.0					
LCS1	Simazine		93.4	99.5	99.8	104.8	98.7	99.8	97.7	97.8	101.4	95.9	97.7	3.6	10.9	86.8	108.5
LCS2	Simazine		89.6	100.8	99.1	96.6	93.7	100.7	100.3	95.1	96.3	92.1					

Sample	Working Stock Standard ID Analytical Date Days Since Spike Compound	WSS 06-30-16 7/1/2016 0	WSS 06-30-16 7/3/2016 2	WSS 06-30-16 7/5/2016 4	WSS 06-30-16 7/8/2016 7	WSS 07-15-16 7/17/2016 16	WSS-07-25-16 7/31/2016 30	WSS 08-15-16 8/15/2016 45	WSS 08-29-16 8/30/2016 60	WSS 09-07-16 9/7/2016 69	WSS-09-21-16 9/21/2016 84	Average	St. Dev.	3x St. Dev.	Lower Control Limit (Average Minus 3x St. Dev.)	Upper Control Limit (Average Plus 3x St. Dev.)
LCS1	Sucralose - M-H	95.1	102.3	105.7	103.9	96.4	98.1	97.2	108.1	102.1	104.0	101.8	3.9	11.8	90.1	113.6
LCS2	Sucralose - M-H	102.4	101.0	104.5	100.0	100.9	105.7	107.8	101.7	95.0	105.2					
LCS1	Sulfachloropyridazine	92.1	95.4	95.3	111.3	103.6	92.9	101.3	95.8	103.7	115.2	99.2	11.4	34.1	65.1	133.3
LCS2	Sulfachloropyridazine	90.2	88.6	87.7	98.9	86.5	92.7	100.5	91.7	106.1	134.4					
LCS1	Sulfadiazine	96.7	104.2	105.5	108.8	107.6	105.3	107.4	96.3	111.6	99.8	103.0	6.0	18.0	85.0	121.0
LCS2	Sulfadiazine	92.6	98.0	97.7	98.8	102.5	103.7	115.5	99.9	110.4	97.5					
LCS1	Sulfadimethoxine	100.5	96.0	100.9	105.0	95.8	100.6	92.2	96.5	133.8	92.1	101.0	12.1	36.3	64.8	137.3
LCS2	Sulfadimethoxine	89.3	97.2	92.6	92.9	95.0	103.6	102.2	111.4	131.4	91.4					
LCS1	Sulfamerazine	92.5	92.8	94.8	105.8	93.0	89.3	101.5	90.1	110.3	103.9	102.7	10.7	32.0	70.7	134.7
LCS2	Sulfamerazine	108.0	111.7	102.5	114.4	105.1	86.7	115.9	96.3	113.5	126.2					
LCS1	Sulfamethazine	102.1	95.2	101.7	111.7	88.5	95.2	98.5	109.6	130.3	113.6	104.1	11.0	33.0	71.0	137.1
LCS2	Sulfamethazine	98.1	90.8	95.0	105.2	98.6	94.7	107.9	106.3	126.6	111.6					
LCS1	Sulfamethizole	98.5	92.3	99.5	108.4	82.7	91.6	92.0	94.1	94.2	106.5	95.4	6.4	19.2	76.3	114.6
LCS2	Sulfamethizole	93.4	94.1	98.4	103.7	89.8	88.8	89.3	93.9	94.6	103.0					
LCS1	Sulfamethoxazole	99.7	101.4	101.2	106.4	101.9	99.8	100.1	102.6	101.5	102.2	100.5	2.4	7.3	93.3	107.8
LCS2	Sulfamethoxazole	100.5	98.9	104.1	102.2	98.1	98.0	98.9	96.5	96.6	100.2					
LCS1	Sulfathiazole	95.8	93.9	93.7	101.6	89.5	91.5	99.2	95.1	131.8	100.5	97.2	11.9	35.7	61.6	132.9
LCS2	Sulfathiazole	85.7	82.1	80.4	100.8	102.3	84.6	94.8	114.3	111.3	95.8					
LCS1	Sulfometuron methyl	103.1	96.6	95.4	108.3	95.9	92.2	103.1	84.7	104.8	98.0	93.3	9.5	28.5	64.7	121.8
LCS2	Sulfometuron methyl	93.7	87.5	94.8	83.0	85.7	105.8	92.2	69.5	84.9	85.9					
LCS1	TCEP	111.9	102.5	99.9	107.3	92.9	96.5	108.7	97.4	101.4	98.6	97.9	8.8	26.5	71.4	124.4
LCS2	TCEP	103.7	95.8	89.6	107.7	75.0	100.7	94.0	88.2	101.4	85.2					
LCS1	TCPP	108.8	99.3	103.7	117.0	124.0	117.0	119.3	84.6	165.3	82.2	110.4	30.9	92.7	17.7	203.1
LCS2	TCPP	119.8	98.0	84.2	111.3	77.2	120.0	117.3	85.7	203.8	69.8					
LCS1	TDCPP - PRM	124.3	99.8	101.7	111.7	113.6	101.5	137.6	101.1	138.4	80.5	98.4	24.2	72.6	25.8	171.1
LCS2	TDCPP - PRM	101.2	77.2	74.3	78.4	131.3	81.6	76.8	110.3	83.1	44.3					
LCS1	Testosterone	101.1	106.3	104.5	118.1	94.8	99.0	98.2	101.4	92.2	82.7	98.9	9.3	28.0	70.9	126.9
LCS2	Testosterone	100.4	103.6	110.8	112.8	82.4	96.9	95.4	93.4	98.7	85.5					
LCS1	Theobromine	66.2	102.6	106.5	111.4	114.8	82.8	101.3	99.1	101.0	111.2	97.3	14.0	42.0	55.3	139.3
LCS2	Theobromine	67.1	92.7	108.1	107.3	98.9	113.1	81.8	93.0	96.6	90.8					
LCS1	Theophyline	77.7	91.3	101.8	106.1	114.3	105.6	83.2	99.0	94.4	110.2	94.1	12.6	37.8	56.3	131.9
LCS2	Theophyline	70.1	96.2	90.0	88.1	108.3	92.5	67.7	93.7	90.3	100.7					
LCS1	Thiabendazole	100.7	97.5	96.3	108.5	90.0	95.4	100.0	89.5	97.5	104.3	100.4	6.3	19.0	81.3	119.4
LCS2	Thiabendazole	105.7	102.2	105.0	112.3	109.8	98.4	96.5	95.3	95.4	107.0					
LCS1	Triclocarban	128.5	97.0	101.8	105.6	74.9	99.8	103.2	89.2	129.2	98.4	104.5	14.6	43.9	60.6	148.4
LCS2	Triclocarban	125.2	102.1	101.2	112.2	92.8	95.4	121.7	99.4	123.3	88.9					
LCS1	Triclosan	73.4	77.1	82.8	91.6	80.4	83.3	73.2	85.0	124.5	91.6	81.6	16.3	49.0	32.5	130.6
LCS2	Triclosan	60.8	60.7	60.3	79.0	76.3	62.4	75.8	96.8	110.8	85.6					
LCS1	Trimethoprim	96.4	87.5	95.8	108.8	105.2	101.9	104.1	100.7	103.6	96.2	98.6	5.7	17.0	81.6	115.5
LCS2	Trimethoprim	103.5	91.1	94.8	90.0	102.3	103.6	100.4	94.4	94.7	96.2					
LCS1	Warfarin	89.8	93.1	92.4	99.9	67.2	84.8	92.1	96.3	115.5	90.4	89.0	12.9	38.8	50.2	127.8
LCS2	Warfarin	80.9	80.1	77.7	92.2	61.4	73.2	99.0	105.3	99.4	89.9					

Table 3. Raw Laboratory Results

	Working Stock Standard ID	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
	Analytical Date	7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
	Days Since Spike	0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
17 alpha ethynylestradiol - M-H	LCS1	105.9	103.1	98.3	108.8	96.2	103.4	96.3	102.5	127.1	86.5
	HDR-1	92.9	82.7	95.1	90.9	84.8	74.4	105.2	109.2	148.4	125.3
	HDR-2	90.6	88.6	87.2	85.9	75.9	75.7	101.2	114.5	93.8	106.1
	HDR-3	81.4	88.1	84.7	87.1	80.7	77.4	91.6	106.2	117.2	82.3
	HDR-4	85.9	91.0	86.1	86.3	67.3	73.7	87.5	97.2	103.6	85.9
	HDR-5	80.9	97.2	84.7	97.2	80.5	79.4	96.0	123.8	121.4	79.7
	HDR-6	87.9	87.6	86.7	84.0	96.8	75.1	101.0	121.1	141.2	95.2
	HDR-7	86.5	89.9	89.2	83.7	85.9	74.2	88.4	114.1	129.5	91.7
	HDR-8	115.4	90.2	105.5	83.1	78.7	72.8	95.9	104.8	124.1	103.5
	HDR-9	86.9	84.1	97.0	103.8	84.2	82.7	100.5	109.7	142.3	89.3
	HDR-10	86.2	78.5	82.6	86.7	88.6	79.4	112.0	117.7	132.2	106.0
	HDR-11	86.8	93.6	83.1	84.8	82.3	84.8	112.4	99.5	149.2	81.3
	LCS2	96.2	98.7	96.7	101.8	108.0	118.0	109.6	126.0	124.4	99.4
17B-Estradiol - M-H	LCS1	109.1	101.2	101.8	105.3	92.6	100.5	103.3	105.1	121.3	92.0
	HDR-1	100.9	99.4	93.8	104.5	98.1	84.3	120.1	105.5	115.1	113.7
	HDR-2	97.6	101.3	96.5	97.1	75.4	76.8	106.2	107.0	84.0	103.6
	HDR-3	93.7	96.7	98.5	99.4	83.9	79.3	99.4	105.2	121.9	86.4
	HDR-4	94.4	96.5	98.1	98.5	77.8	74.0	104.0	95.1	100.9	95.3
	HDR-5	101.2	96.2	98.6	89.3	70.0	82.6	105.1	112.9	118.1	96.8
	HDR-6	99.4	91.4	92.6	97.3	89.6	77.1	105.6	101.2	132.9	101.9
	HDR-7	89.9	98.4	94.7	102.8	84.4	79.8	110.8	114.4	118.5	91.9
	HDR-8	105.8	99.8	94.8	94.5	76.3	74.3	96.7	108.3	128.8	97.8
	HDR-9	92.7	100.9	97.7	96.7	82.5	75.1	109.1	111.9	122.7	92.2
	HDR-10	101.3	98.3	94.3	90.5	74.8	79.1	94.6	98.1	131.6	89.1
	HDR-11	99.5	100.7	93.5	65.7	84.2	84.2	104.6	115.4	132.0	93.7
	LCS2	102.2	100.3	92.8	111.0	105.0	99.5	111.4	126.1	136.3	97.3
2,4-D	LCS1	102.7	66.8	98.9	103.5	96.5	94.5	98.4	98.2	128.8	90.6
	HDR-1	111.0	96.6	122.4	137.2	129.0	96.4	104.6	101.2	160.0	175.0
	HDR-2	127.0	100.0	132.7	125.2	95.9	89.4	113.0	104.8	110.7	157.8
	HDR-3	108.5	104.8	131.5	133.3	120.8	85.9	129.8	117.8	149.5	160.8
	HDR-4	126.2	77.0	121.8	135.8	124.8	83.5	96.3	107.0	112.5	132.0
	HDR-5	121.5	83.6	119.6	110.1	106.7	92.8	121.6	126.3	146.6	156.7
	HDR-6	134.1	76.7	108.8	129.6	108.9	86.2	102.0	111.5	157.3	138.3
	HDR-7	113.5	98.5	119.5	125.0	94.3	87.3	106.9	100.9	128.6	158.0
	HDR-8	149.1	90.6	113.4	127.0	113.3	77.5	101.4	111.4	155.9	112.3
	HDR-9	128.1	88.4	132.7	120.1	119.9	78.3	104.7	110.3	152.8	130.0
	HDR-10	106.6	87.2	139.3	113.5	114.2	79.5	104.5	109.5	151.2	137.5
	HDR-11	150.0	75.9	108.5	104.2	101.5	80.1	99.3	121.0	154.8	123.4
	LCS2	97.3	62.8	90.3	98.8	96.9	98.4	101.1	104.3	121.7	91.7
	LCS1	84.9	86.8	79.9	112.2	87.7	88.2	82.5	100.6	109.2	90.4
4-tert-OctylphenoL	HDR-1	80.8	118.9	119.6	143.8	-0.3	87.4	145.3	106.4	105.3	116.4
	HDR-2	96.1	144.6	126.0	142.8	77.1	87.1	156.0	106.5	110.9	109.2
	HDR-3	82.4	131.6	105.2	144.0	74.0	81.0	126.8	101.3	100.3	91.8
	HDR-4	79.5	112.3	113.5	134.9	65.2	71.7	121.4	108.1	81.0	76.4
	HDR-5	90.5	128.2	121.3	106.7	69.8	84.8	117.8	146.2	96.3	99.1
	HDR-6	86.1	108.7	125.1	132.8	64.5	79.0	122.9	104.4	112.3	97.3

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-7	79.4	118.2	126.5	146.6	64.0	81.9	120.8	107.1	107.6	90.5
	HDR-8	78.1	121.2	119.3	134.3	64.4	78.8	111.5	106.6	97.7	97.6
	HDR-9	86.1	114.9	129.3	123.3	78.5	84.7	119.3	101.5	99.5	89.7
	HDR-10	76.2	116.7	138.2	110.2	73.2	79.7	124.4	129.1	129.1	105.7
	HDR-11	93.6	114.1	123.5	106.9	68.4	78.9	136.7	88.1	108.8	99.5
	LCS2	68.8	89.5	82.9	101.2	90.3	78.5	87.5	98.3	95.7	88.9
Acesulfame	LCS1	98.2	100.5	99.9	109.7	104.3	100.2	99.1	103.0	99.2	102.6
	HDR-1	103.5	103.0	103.0	96.1	96.8	92.5	112.1	97.9	117.2	114.3
	HDR-2	97.5	101.9	103.1	87.9	101.3	86.5	91.1	97.2	115.6	137.4
	HDR-3	88.5	99.2	97.4	105.4	97.7	87.4	96.5	99.1	119.5	132.3
	HDR-4	102.9	90.0	81.4	93.9	95.8	90.6	104.0	91.9	116.1	122.5
	HDR-5	101.1	101.2	86.7	94.6	96.6	96.4	103.1	102.8	125.0	128.6
	HDR-6	86.7	99.5	105.4	105.8	99.6	85.3	110.3	94.9	120.9	126.6
	HDR-7	92.7	89.2	99.3	106.7	92.6	87.7	114.7	98.9	115.6	129.6
	HDR-8	93.5	96.5	88.0	96.3	90.0	87.9	103.8	98.2	116.1	130.5
	HDR-9	95.4	83.7	97.3	86.9	97.3	94.9	109.9	110.1	119.7	112.2
	HDR-10	87.9	101.3	86.3	94.7	97.8	82.5	102.3	108.2	121.0	119.8
	HDR-11	102.1	101.0	100.0	74.9	97.5	78.2	104.8	95.7	122.4	126.9
	LCS2	100.2	99.7	102.6	106.3	99.9	101.7	103.4	98.6	97.3	102.6
Acetaminophen	LCS1	93.4	101.7	101.8	104.2	96.5	96.9	95.7	100.7	101.4	89.1
	HDR-1	92.9	101.1	103.8	99.4	82.4	85.2	109.2	85.2	83.3	83.2
	HDR-2	91.1	101.3	97.8	121.0	67.6	81.0	108.6	83.7	76.5	81.1
	HDR-3	84.0	128.2	111.3	105.8	77.4	69.1	109.8	82.4	72.2	73.3
	HDR-4	73.8	90.4	109.7	101.1	75.4	60.7	108.8	84.6	60.8	80.0
	HDR-5	88.8	96.0	123.9	109.3	94.4	81.4	111.9	111.7	88.2	69.5
	HDR-6	94.1	96.9	115.4	124.1	88.3	74.4	106.9	83.8	75.3	78.8
	HDR-7	96.8	84.7	119.5	101.5	117.8	92.5	111.4	79.4	65.2	83.7
	HDR-8	75.0	105.9	107.9	116.6	79.8	71.9	89.9	80.4	61.7	80.1
	HDR-9	87.4	89.1	112.1	116.2	91.0	74.9	106.5	82.3	74.9	88.9
	HDR-10	89.3	122.1	107.2	98.1	84.2	71.4	90.5	88.6	77.0	87.4
	HDR-11	113.0	127.4	111.0	69.7	89.7	73.0	101.4	83.1	69.0	83.7
	LCS2	90.4	99.9	97.8	101.3	106.5	96.7	96.7	102.9	101.4	89.6
Albuterol	LCS1	79.2	117.8	85.9	99.3	122.7	91.9	96.8	248.8	61.2	63.0
	HDR-1	101.7	109.4	88.2	122.0	125.8	83.6	178.8	731.0	89.7	127.6
	HDR-2	109.3	111.0	128.1	141.8	152.6	110.4	152.2	391.6	126.0	132.1
	HDR-3	94.4	98.0	96.4	137.7	156.8	84.0	175.7	619.1	103.2	149.6
	HDR-4	102.6	106.3	84.7	136.8	108.9	56.8	115.6	561.6	92.0	119.5
	HDR-5	119.3	103.4	99.6	140.7	113.6	93.3	175.1	478.2	101.8	121.2
	HDR-6	95.6	105.5	122.0	112.4	120.0	86.2	146.6	479.5	108.6	130.7
	HDR-7	93.9	101.4	75.1	109.7	104.2	73.7	133.1	589.4	96.0	117.5
	HDR-8	112.3	117.6	132.0	109.8	127.1	93.5	136.7	576.6	90.0	102.3
	HDR-9	115.8	114.9	122.6	80.9	132.6	43.4	147.9	575.2	78.8	133.6
	HDR-10	121.4	112.4	99.2	123.0	129.6	48.2	133.1	1136.2	128.1	108.0
	HDR-11	98.5	99.2	113.4	103.5	133.2	45.9	181.4	380.5	117.0	105.0
	LCS2	88.4	101.9	73.1	105.0	98.6	64.0	134.3	56.7	70.0	62.9

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
Amoxicilin	LCS1	95.6	102.6	98.0	100.5	75.2	104.5	98.9	98.2	122.9	88.6
	HDR-1	39.1	33.5	54.5	42.1	304.8	123.0	474.9	750.1	728.1	577.0
	HDR-2	31.8	38.8	18.3	48.7	333.8	113.9	445.2	727.5	578.9	650.1
	HDR-3	13.1	19.9	59.8	40.4	264.6	105.1	443.8	625.1	717.3	580.4
	HDR-4	45.5	31.9	18.0	47.1	338.5	75.1	419.8	657.9	701.4	583.7
	HDR-5	28.3	21.4	42.2	33.9	279.6	87.0	393.6	600.5	655.3	690.4
	HDR-6	39.5	25.2	29.2	46.5	226.8	106.5	368.8	735.5	668.8	588.5
	HDR-7	10.4	36.6	36.5	28.9	311.9	92.5	427.6	646.5	771.7	611.4
	HDR-8	23.2	31.5	57.7	37.8	362.4	119.2	339.2	609.5	609.5	636.5
	HDR-9	26.5	23.7	30.6	26.7	267.5	112.5	436.6	638.6	755.0	685.6
	HDR-10	51.6	25.4	44.8	18.4	350.1	72.5	289.8	786.0	606.3	471.4
	HDR-11	48.9	29.4	29.9	20.4	371.8	106.0	456.4	684.6	717.4	574.3
	LCS2	97.5	106.2	100.1	110.2	128.8	92.6	113.4	99.6	139.8	105.7
Andorostenedione	LCS1	126.5	88.7	99.5	114.6	92.0	96.9	128.1	97.8	95.2	109.6
	HDR-1	63.4	68.9	67.7	81.1	67.3	61.4	71.4	91.7	77.0	98.1
	HDR-2	63.8	78.6	74.2	77.8	69.8	46.8	88.2	83.4	94.0	92.9
	HDR-3	59.5	58.0	60.8	83.4	101.7	54.8	70.9	79.7	74.9	94.0
	HDR-4	64.0	48.4	55.4	78.5	82.2	39.9	82.2	75.3	93.3	84.7
	HDR-5	55.9	64.6	65.3	69.6	92.0	54.3	72.9	125.0	91.1	89.3
	HDR-6	77.0	57.8	62.0	66.5	87.2	50.7	79.1	81.3	95.8	102.6
	HDR-7	74.3	63.4	60.8	76.6	94.6	44.5	92.1	97.3	86.4	108.3
	HDR-8	74.3	60.2	60.1	76.9	81.5	49.2	60.1	96.0	78.8	101.7
	HDR-9	73.0	68.4	70.4	68.1	92.7	49.2	88.0	78.7	97.1	109.0
	HDR-10	73.6	50.1	64.4	74.1	82.5	50.3	68.9	126.1	98.3	101.5
	HDR-11	79.1	56.8	74.3	47.1	87.5	46.7	92.4	67.6	78.4	129.6
	LCS2	100.0	86.9	87.2	100.5	123.8	93.4	98.3	95.5	91.8	93.4
Atenolol	LCS1	123.8	94.4	107.2	118.1	89.6	76.6	100.6	107.6	100.6	107.8
	HDR-1	49.8	38.6	35.6	53.5	41.3	37.3	52.2	57.5	57.9	56.0
	HDR-2	45.8	43.1	40.6	49.1	41.2	33.6	42.0	59.2	56.5	53.3
	HDR-3	51.9	36.0	37.6	51.8	37.8	31.7	41.3	68.2	55.0	51.0
	HDR-4	42.6	36.8	40.3	47.3	43.0	31.5	48.7	64.4	54.0	51.6
	HDR-5	54.6	40.0	42.0	50.1	42.9	34.8	45.6	73.7	60.6	51.6
	HDR-6	48.5	33.7	39.2	45.2	38.2	30.9	46.8	66.8	53.8	49.8
	HDR-7	47.6	38.1	44.7	48.6	39.6	31.7	42.4	69.3	60.4	49.2
	HDR-8	40.0	36.0	36.2	46.1	39.5	35.9	48.0	70.3	53.3	53.0
	HDR-9	47.0	42.0	39.4	43.4	43.0	34.3	44.5	71.3	57.7	47.8
	HDR-10	40.8	36.3	40.8	48.6	41.2	36.1	52.3	93.5	61.1	51.1
	HDR-11	51.9	37.2	37.5	37.8	42.1	33.4	50.0	67.4	55.1	53.9
	LCS2	118.5	98.3	107.0	113.8	98.0	98.7	87.1	101.5	88.2	110.6
Atrazine	LCS1	97.3	112.2	99.6	109.5	97.8	98.0	95.2	92.4	100.1	102.2
	HDR-1	70.1	68.3	66.4	75.0	82.0	68.3	71.3	67.0	85.5	66.3
	HDR-2	71.4	67.4	78.5	71.7	82.7	67.0	71.2	64.5	84.9	77.3
	HDR-3	74.6	73.6	72.2	69.5	87.2	65.5	72.6	62.9	91.6	82.8
	HDR-4	78.3	73.0	71.8	69.7	82.6	69.0	78.2	66.7	88.4	74.1
	HDR-5	69.4	82.9	68.7	71.6	86.4	68.5	72.6	64.5	85.0	81.7
	HDR-6	76.2	72.2	76.4	65.3	83.0	65.8	77.7	70.9	81.3	81.8
	HDR-7	67.9	74.5	77.5	65.6	87.5	66.0	75.5	61.8	84.5	74.5
	HDR-8	74.4	64.0	70.2	71.0	84.1	64.1	71.0	63.9	84.7	83.8

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-9	76.3	79.2	69.1	62.4	86.0	64.1	77.3	64.7	79.7	76.2
	HDR-10	68.3	71.8	71.7	70.6	88.3	57.8	76.3	50.0	86.6	67.3
	HDR-11	73.0	66.0	68.4	41.2	86.1	61.8	65.1	60.9	87.4	77.2
	LCS2	105.9	101.3	100.9	102.2	113.7	97.1	105.9	86.8	106.1	107.1
Bendroflumethiazide - M-H	LCS1	103.7	97.3	97.7	107.3	83.7	94.2	90.2	99.3	85.0	103.9
	HDR-1	181.1	183.9	182.5	183.9	103.9	264.2	141.6	118.5	142.7	130.1
	HDR-2	182.3	186.6	189.6	173.9	101.7	281.8	130.8	112.2	142.9	115.3
	HDR-3	175.2	194.9	175.6	179.4	107.4	276.1	125.7	116.0	128.2	117.1
	HDR-4	169.4	172.0	164.1	166.3	97.3	255.3	130.7	136.1	125.4	104.0
	HDR-5	182.7	162.4	199.6	160.3	99.4	268.9	120.1	144.8	150.4	101.5
	HDR-6	164.2	169.1	173.8	170.4	108.2	256.5	129.9	114.3	135.5	115.4
	HDR-7	163.5	176.7	176.8	152.9	101.6	246.7	121.7	110.0	131.1	117.0
	HDR-8	158.7	154.5	163.1	163.0	98.2	271.6	115.1	116.6	130.3	109.9
	HDR-9	162.7	157.5	158.5	143.3	110.9	250.8	115.1	112.2	139.6	101.0
	HDR-10	148.9	159.9	177.8	163.1	97.9	254.3	126.4	77.5	143.5	109.1
	HDR-11	192.2	156.9	161.1	170.0	101.5	253.3	121.3	105.1	140.9	113.6
	LCS2	94.4	91.2	95.4	106.2	89.7	90.1	93.8	93.9	83.0	92.6
Bezafibrate	LCS1	96.4	92.9	98.8	106.8	87.9	92.4	85.6	98.3	106.7	112.3
	HDR-1	170.9	174.7	169.0	190.6	151.1	146.8	240.4	186.0	189.5	207.9
	HDR-2	177.7	177.2	165.9	186.1	140.2	153.6	202.2	171.3	178.4	188.5
	HDR-3	162.8	174.6	168.4	182.8	135.8	145.8	222.0	168.0	175.9	165.9
	HDR-4	162.3	161.9	150.2	188.3	122.2	133.2	200.9	189.7	169.3	174.6
	HDR-5	182.3	167.7	179.8	170.2	133.8	150.0	197.5	215.2	191.0	186.4
	HDR-6	160.4	165.1	166.8	182.1	137.9	148.1	215.8	184.5	188.4	193.3
	HDR-7	165.4	165.6	164.6	181.7	127.3	138.3	199.8	169.7	191.5	202.6
	HDR-8	161.1	170.0	150.7	178.2	132.0	141.4	183.7	170.5	186.7	174.5
	HDR-9	159.3	156.5	162.0	174.6	153.3	149.4	200.9	185.3	219.8	169.7
	HDR-10	149.0	160.0	170.5	178.7	135.1	151.3	210.2	145.8	203.7	193.8
	HDR-11	184.8	157.8	147.5	159.8	145.7	141.7	197.3	160.7	183.4	182.0
	LCS2	96.0	102.6	103.5	118.7	98.0	92.1	107.1	96.6	113.7	93.0
Bisphenol A	LCS1	101.7	100.4	98.1	109.4	99.9	98.5	100.1	100.1	97.6	95.6
	HDR-1	94.7	94.9	92.2	102.7	90.8	75.0	97.6	98.1	101.5	96.0
	HDR-2	95.8	94.4	95.0	100.7	88.7	72.0	96.9	101.9	99.0	94.2
	HDR-3	96.8	97.6	96.9	101.5	94.7	71.1	97.6	98.8	96.3	91.0
	HDR-4	101.0	94.1	92.2	97.4	86.0	70.4	92.3	95.5	91.7	85.5
	HDR-5	95.1	92.5	96.8	100.8	90.1	77.8	98.1	106.5	99.4	92.9
	HDR-6	99.9	96.5	91.8	95.5	87.4	74.4	103.4	98.9	101.0	97.2
	HDR-7	132.9	94.6	100.0	100.1	89.2	70.1	97.9	94.4	103.4	94.9
	HDR-8	99.6	95.5	98.6	97.8	80.6	65.5	91.3	93.8	92.9	95.9
	HDR-9	99.0	93.1	93.7	93.0	97.1	75.2	95.0	98.7	100.1	90.6
	HDR-10	101.6	89.6	98.6	99.4	90.4	75.4	100.6	168.2	96.6	92.3
	HDR-11	102.8	97.7	91.2	78.5	92.8	73.7	97.9	93.1	98.2	96.5
	LCS2	101.0	102.2	103.3	106.1	101.4	98.2	101.0	99.9	95.9	96.0
Bromacil	LCS1	99.4	92.0	94.8	101.9	88.7	92.7	101.0	83.9	91.7	98.1
	HDR-1	132.7	140.0	137.0	151.8	124.0	143.8	178.7	119.8	143.2	157.1
	HDR-2	138.5	136.6	149.0	143.7	102.1	135.4	176.3	118.9	131.2	133.6
	HDR-3	138.4	124.5	133.8	131.6	105.1	122.5	162.5	106.8	131.6	173.9
	HDR-4	130.1	111.5	127.6	156.2	104.4	130.8	159.4	114.8	130.8	134.3

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-5	135.0	129.7	146.3	145.5	109.1	138.2	162.5	140.2	147.3	132.4
	HDR-6	132.8	123.4	134.4	149.6	120.1	127.2	160.8	105.3	117.3	137.8
	HDR-7	128.7	140.4	130.5	156.7	99.1	122.7	164.9	101.2	126.7	129.5
	HDR-8	127.4	144.0	145.1	148.7	108.0	131.2	146.8	103.2	150.4	139.9
	HDR-9	136.6	133.8	132.0	140.4	121.4	130.5	161.4	117.5	136.9	133.9
	HDR-10	110.9	123.4	135.0	157.6	122.6	128.1	171.8	172.1	120.3	139.8
	HDR-11	149.8	120.3	115.4	113.2	108.6	130.1	154.5	103.0	131.9	153.1
	LCS2	97.2	97.1	98.2	98.7	85.5	92.3	104.2	92.7	93.5	101.0
Clofibric acid	LCS1	105.0	101.1	98.2	99.7	97.7	99.7	94.9	95.7	132.8	92.8
	HDR-1	132.1	133.6	126.7	141.3	127.6	108.2	137.0	111.6	131.9	134.4
	HDR-2	126.0	140.2	122.9	129.0	114.3	100.6	129.2	103.0	81.3	131.9
	HDR-3	140.9	138.6	123.5	130.5	110.9	95.7	120.3	106.2	114.1	122.1
	HDR-4	122.1	132.3	126.8	135.1	121.2	100.8	120.8	96.6	91.8	122.4
	HDR-5	132.1	140.4	129.7	131.0	115.4	108.3	127.7	114.1	114.7	132.8
	HDR-6	130.8	135.5	129.7	132.8	123.3	105.9	128.5	102.0	130.3	126.3
	HDR-7	131.3	125.1	125.1	135.9	137.9	97.6	131.7	106.9	104.7	114.7
	HDR-8	132.0	126.8	125.1	128.9	130.5	94.2	123.1	94.3	145.2	116.1
	HDR-9	133.2	139.9	124.9	130.1	135.7	105.1	123.0	99.0	135.5	115.8
	HDR-10	137.3	138.2	118.2	127.9	128.5	101.1	123.1	100.8	125.4	133.5
	HDR-11	131.1	129.6	119.0	123.5	121.8	102.0	129.4	100.1	133.4	124.1
	LCS2	102.2	100.0	94.6	93.8	99.4	98.7	103.6	107.8	115.1	107.7
Butalbital	LCS1	100.4	99.2	103.3	111.9	85.6	93.0	91.5	90.6	94.9	88.7
	HDR-1	118.7	121.3	114.3	149.6	135.4	120.6	139.1	117.6	154.4	154.8
	HDR-2	99.9	123.3	120.1	126.3	118.5	111.1	138.7	117.3	160.2	134.9
	HDR-3	108.2	107.0	107.0	136.8	117.7	107.4	126.6	124.9	132.8	132.8
	HDR-4	101.3	96.5	105.4	133.8	124.3	113.1	118.8	130.5	145.0	131.2
	HDR-5	101.7	118.7	121.3	125.9	123.9	108.3	114.4	160.6	129.6	146.9
	HDR-6	94.6	116.0	117.5	132.5	125.8	111.3	113.1	122.8	124.3	151.7
	HDR-7	115.8	119.1	111.7	126.5	117.0	110.9	124.7	109.2	143.6	132.8
	HDR-8	107.6	111.3	115.3	143.7	110.3	107.8	107.2	115.3	126.6	137.1
	HDR-9	108.4	125.9	106.8	127.7	112.6	117.0	115.0	109.8	151.1	128.1
	HDR-10	94.5	100.9	129.2	124.4	121.0	119.8	129.1	246.4	145.1	132.6
	HDR-11	115.5	110.5	109.6	156.1	120.0	113.0	119.4	113.2	141.0	126.1
	LCS2	92.9	103.2	98.6	105.3	96.2	90.6	88.9	94.7	90.2	90.3
Butylparaben-NEG	LCS1	98.2	94.8	101.5	96.5	88.9	96.0	93.8	99.6	124.3	96.4
	HDR-1	100.0	101.5	100.2	104.9	92.6	105.3	129.3	107.7	151.3	119.1
	HDR-2	90.9	96.4	95.6	102.1	89.2	96.0	126.1	107.0	110.2	118.3
	HDR-3	97.9	96.3	92.2	100.1	89.1	97.9	122.7	108.2	140.0	118.8
	HDR-4	97.4	100.4	96.8	100.5	87.1	95.0	120.2	100.6	127.7	105.3
	HDR-5	94.7	100.3	100.8	99.8	88.9	102.1	115.7	110.8	141.2	113.2
	HDR-6	99.2	98.5	98.8	97.2	94.1	98.9	125.0	108.6	163.0	118.5
	HDR-7	94.7	103.2	98.5	98.3	95.3	97.6	118.3	108.5	143.4	116.9
	HDR-8	102.3	92.6	96.4	100.7	94.3	91.7	118.2	107.8	143.9	113.5
	HDR-9	96.6	96.6	95.7	101.7	95.7	104.5	121.4	110.3	165.8	115.4
	HDR-10	92.8	92.4	98.7	96.3	95.5	96.1	115.5	99.0	165.9	119.9
	HDR-11	95.5	100.0	92.6	77.0	91.8	94.6	118.1	104.5	153.8	112.8
	LCS2	95.8	91.6	87.1	97.6	95.1	84.7	103.1	113.9	120.3	94.6
Caffeine	LCS1	99.6	98.1	99.3	114.8	104.3	99.9	103.2	92.4	102.3	101.6

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-1	81.3	111.6	107.4	92.5	69.6	93.0	187.8	117.1	108.4	86.8
	HDR-2	80.7	105.6	99.9	102.4	120.4	68.4	117.1	84.8	102.1	137.4
	HDR-3	77.0	95.5	112.1	40.4	164.3	92.7	122.1	107.0	137.2	198.3
	HDR-4	92.4	114.5	80.5	102.6	97.0	72.2	115.3	103.5	127.8	101.3
	HDR-5	112.7	132.8	158.9	116.4	83.2	114.7	49.9	122.1	134.2	69.3
	HDR-6	143.8	111.3	107.1	115.6	135.2	90.1	105.8	107.5	74.9	109.5
	HDR-7	66.0	111.1	91.6	98.8	76.5	63.8	59.0	107.1	98.3	103.3
	HDR-8	130.6	183.9	108.5	136.5	42.3	71.8	102.5	129.2	133.7	89.4
	HDR-9	102.0	99.8	107.9	95.1	81.3	155.5	72.7	89.7	99.4	69.7
	HDR-10	97.1	72.9	123.1	126.0	98.6	81.2	123.5	274.4	115.5	148.4
	HDR-11	107.6	73.0	115.7	67.4	110.6	133.1	103.8	86.1	102.5	108.9
	LCS2	106.5	100.8	104.7	115.6	112.1	101.3	104.8	96.4	105.6	108.1
Carbadox	LCS1	109.5	91.6	100.0	107.6	87.8	73.5	101.0	99.3	141.8	95.2
	HDR-1	93.0	117.6	90.7	114.3	102.1	98.9	105.9	115.8	131.2	117.6
	HDR-2	92.8	88.3	114.0	114.2	115.5	66.5	121.4	108.4	85.6	160.7
	HDR-3	102.9	97.8	112.1	118.8	101.0	88.8	102.6	101.8	111.0	121.2
	HDR-4	110.2	99.3	114.1	88.8	99.6	100.7	109.9	124.7	115.1	163.2
	HDR-5	116.5	98.8	113.0	105.7	105.5	101.4	104.1	149.7	127.4	114.2
	HDR-6	114.2	92.4	83.9	86.1	117.3	66.8	119.3	130.7	120.8	156.5
	HDR-7	100.5	103.8	100.6	104.3	101.2	77.1	117.9	138.6	105.8	136.8
	HDR-8	112.2	110.0	86.7	100.0	95.3	85.0	126.0	111.4	101.2	114.2
	HDR-9	110.5	104.9	112.3	89.0	115.8	97.6	124.3	133.1	147.3	117.6
	HDR-10	105.5	116.8	104.6	103.5	111.9	76.0	97.1	112.6	166.3	112.4
	HDR-11	128.1	116.5	109.1	66.0	109.2	68.5	88.6	112.7	115.8	117.2
	LCS2	101.0	93.7	99.5	102.8	96.2	94.3	95.0	109.9	112.9	96.1
Carbamazepine	LCS1	96.5	95.1	105.9	112.5	103.4	93.9	100.4	96.6	105.8	90.1
	HDR-1	124.2	132.1	118.9	133.8	114.2	96.4	119.3	116.9	133.2	137.5
	HDR-2	124.0	134.5	128.9	134.5	118.1	96.0	124.5	120.5	138.6	134.4
	HDR-3	135.4	125.1	125.1	134.8	119.2	91.1	116.8	131.7	128.7	135.8
	HDR-4	129.6	127.4	125.2	125.7	113.8	92.9	123.2	128.2	132.9	133.1
	HDR-5	124.2	125.4	123.0	137.9	113.8	101.0	119.3	130.1	140.4	124.1
	HDR-6	129.4	124.6	132.1	131.6	123.2	99.0	129.7	126.5	136.5	131.2
	HDR-7	134.3	126.6	135.4	134.6	122.2	97.5	113.7	121.7	124.5	125.4
	HDR-8	125.5	124.5	131.5	130.8	114.6	89.4	114.9	117.2	128.7	119.2
	HDR-9	133.2	127.8	124.8	129.1	129.6	101.9	118.1	122.6	141.6	122.3
	HDR-10	128.9	122.0	127.8	141.5	131.3	91.4	120.5	135.4	132.0	128.7
	HDR-11	135.2	123.8	137.2	102.9	132.3	99.3	126.4	117.2	125.4	122.8
	LCS2	103.8	98.1	99.8	102.6	105.8	98.8	97.9	85.1	99.2	94.5
Carisoprodol	LCS1	98.6	101.6	107.3	117.7	103.0	106.5	81.2	100.3	98.6	127.6
	HDR-1	108.5	117.9	147.8	141.5	117.8	129.4	334.8	107.9	138.6	167.6
	HDR-2	113.8	111.0	168.6	134.9	95.6	144.8	156.6	85.0	123.0	183.1
	HDR-3	102.8	121.0	139.3	134.6	93.0	116.1	268.0	91.1	143.7	200.1
	HDR-4	113.5	116.4	126.7	142.6	115.5	99.9	163.5	81.3	141.4	165.1
	HDR-5	151.3	163.0	200.6	156.5	129.7	602.9	88.0	95.2	164.7	126.1
	HDR-6	137.3	124.0	128.2	114.5	89.4	105.8	209.9	92.9	121.1	146.7
	HDR-7	91.7	128.5	119.1	116.3	92.9	141.4	140.1	99.5	129.6	138.5
	HDR-8	111.8	169.5	107.9	165.8	97.1	95.8	156.7	95.8	143.7	130.5
	HDR-9	127.1	104.4	105.1	105.3	99.1	352.6	138.6	94.7	157.1	124.3

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Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-10	95.6	123.1	174.6	145.1	78.6	97.3	208.4	190.7	171.0	141.6
	HDR-11	112.2	107.0	128.6	210.1	111.8	144.3	174.6	67.5	148.0	138.5
	LCS2	94.5	79.6	91.1	80.3	110.8	85.9	75.6	97.7	79.8	77.7
Chloramphenicol_M-H	LCS1	99.8	103.5	89.5	108.2	92.2	101.0	103.5	104.7	128.3	103.5
	HDR-1	98.2	116.6	103.1	114.7	125.4	94.6	106.9	74.4	106.7	113.4
	HDR-2	109.1	102.9	89.1	101.5	95.6	89.8	99.8	82.9	74.5	109.1
	HDR-3	105.7	105.6	99.3	104.6	101.3	79.2	103.2	75.8	97.6	107.3
	HDR-4	97.9	97.4	105.3	102.3	108.3	77.9	84.8	75.0	82.2	91.6
	HDR-5	112.2	101.7	107.5	104.8	98.4	95.4	101.3	76.2	96.1	104.0
	HDR-6	106.2	101.4	97.5	96.2	110.1	87.1	109.3	83.3	107.2	90.1
	HDR-7	113.3	103.4	83.1	100.3	105.7	84.0	111.4	82.4	93.4	89.0
	HDR-8	108.0	98.8	98.8	107.6	114.5	78.5	97.8	71.9	102.7	85.9
	HDR-9	98.7	107.0	101.7	99.6	103.7	91.2	102.2	79.2	109.6	102.4
	HDR-10	91.3	98.1	87.5	107.5	113.6	90.7	103.5	76.2	105.0	91.8
	HDR-11	107.3	96.4	101.7	79.1	96.0	77.1	112.3	74.4	106.4	91.8
	LCS2	82.0	91.7	82.6	83.3	100.7	93.8	102.1	110.9	118.3	89.0
Chloridazon	LCS1	101.7	98.9	102.7	106.5	88.7	94.8	94.2	88.4	97.1	108.0
	HDR-1	96.8	87.5	79.4	100.4	95.6	83.3	127.4	81.6	110.5	114.6
	HDR-2	102.8	79.5	90.9	104.9	76.4	101.4	130.3	95.2	131.3	129.2
	HDR-3	82.3	93.3	84.8	83.2	77.5	88.0	122.2	96.0	114.1	106.3
	HDR-4	76.0	70.7	88.7	90.2	69.9	77.8	106.6	104.2	124.7	132.4
	HDR-5	77.9	73.9	88.0	94.8	75.3	77.1	110.1	106.4	110.3	104.6
	HDR-6	74.8	89.3	95.2	90.8	76.4	84.9	109.4	78.3	125.6	129.7
	HDR-7	85.5	76.0	82.4	88.3	3.0	81.9	108.0	91.8	127.8	138.0
	HDR-8	79.4	84.5	101.8	104.0	76.1	85.6	101.6	92.2	104.9	157.6
	HDR-9	75.6	77.7	81.4	81.1	89.5	89.8	91.6	91.5	111.2	139.0
	HDR-10	76.4	70.2	113.2	94.4	81.6	96.4	105.7	77.4	126.2	147.4
	HDR-11	75.7	77.3	100.8	79.7	75.0	85.0	108.5	88.7	116.1	141.2
	LCS2	92.9	99.5	101.0	98.4	85.6	94.4	102.2	89.5	96.7	116.9
Chlorotoluron	LCS1	105.7	97.3	95.2	108.5	84.7	94.4	92.6	99.4	92.3	107.8
	HDR-1	99.9	102.8	105.1	115.7	100.7	110.8	155.8	125.1	155.3	160.9
	HDR-2	104.7	98.5	106.9	112.7	97.3	109.2	144.8	123.5	150.4	149.8
	HDR-3	104.4	101.7	99.1	106.6	96.8	100.5	147.9	116.5	131.9	141.5
	HDR-4	102.1	87.9	96.1	103.2	93.5	97.0	147.6	129.6	131.9	131.7
	HDR-5	96.3	92.1	109.6	106.8	95.1	101.9	134.5	146.8	149.6	128.9
	HDR-6	91.1	93.5	99.9	109.5	94.0	101.0	145.5	120.9	143.5	135.2
	HDR-7	97.9	95.4	100.0	106.5	90.8	95.8	134.2	116.1	133.7	140.7
	HDR-8	91.8	92.0	97.1	106.4	87.7	105.6	127.9	116.3	135.9	136.6
	HDR-9	97.6	94.3	95.6	94.6	103.9	107.5	137.4	121.1	149.3	127.6
	HDR-10	90.9	88.9	104.1	108.8	94.3	96.3	144.6	107.3	157.8	136.1
	HDR-11	110.1	89.8	96.1	79.0	98.9	98.1	143.4	115.0	143.2	140.3
	LCS2	112.0	99.0	103.4	113.5	91.6	91.5	105.8	102.0	88.7	101.3
Cimetidine - PRM	LCS1	119.0	109.2	105.7	99.2	79.3		103.7	103.5	120.3	104.2
	HDR-1	38.1	54.9	38.9	109.5	27.1		12.9		30.9	9.6
	HDR-2	43.1	49.2	34.0	109.6	21.4		13.9		28.3	15.9
	HDR-3	38.1	50.7	37.9	101.7	15.9		12.6		23.8	14.0
	HDR-4	43.1	62.3	35.2	120.6	10.2		18.0		29.8	18.1
	HDR-5	38.8	49.5	34.8	121.1	18.4		19.5		37.9	20.0

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Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-6	43.9	53.7	34.6	99.9	15.7		16.0		32.1	15.3
	HDR-7	38.2	52.7	34.1	101.4	16.9		20.3		40.7	11.8
	HDR-8	39.4	54.7	25.8	103.7	15.7		17.7		38.4	16.5
	HDR-9	38.6	53.7	27.8	110.5	24.4		19.2		37.6	15.2
	HDR-10	31.8	52.0	33.6	111.1	13.1		27.4		40.1	9.5
	HDR-11	38.0	48.9	32.6	101.4	29.1		11.9		47.7	14.0
	LCS2	96.7	111.8	96.7	68.7	103.9		82.7	104.4	99.8	93.2
Cotinine - PRM	LCS1	94.7	99.2	106.4	115.5	101.7	91.9	100.7	98.6	103.4	89.6
	HDR-1	95.0	115.8	114.7	98.7	110.0	69.2	100.9	113.8	112.5	124.3
	HDR-2	110.6	107.1	118.0	93.0	83.7	70.2	93.9	111.2	112.6	122.8
	HDR-3	113.7	116.9	118.7	99.1	99.2	88.5	100.6	109.1	104.8	108.1
	HDR-4	118.5	116.0	123.2	96.5	99.9	79.8	97.4	91.7	109.1	131.3
	HDR-5	120.2	118.6	138.6	99.2	102.9	76.6	80.5	121.7	115.4	142.9
	HDR-6	113.5	116.3	136.8	99.2	95.9	104.0	103.0	100.5	118.6	96.6
	HDR-7	106.6	108.4	123.4	88.4	107.7	100.3	101.9	106.5	103.4	123.2
	HDR-8	123.5	123.8	151.9	98.3	101.9	74.5	89.1	109.2	108.8	132.6
	HDR-9	116.5	120.1	N/F	111.8	91.4	86.0	108.4	120.8	131.8	116.4
	HDR-10	104.3	103.2	123.9	88.5	114.9	90.9	95.2	182.9	118.8	127.4
	HDR-11	123.5	120.3	127.1	90.1	97.9	92.2	99.6	117.4	131.5	131.0
	LCS2	90.3	98.5	105.9	104.3	96.3	89.6	94.7	93.7	97.0	81.9
Cyanazine	LCS1	99.0	98.7	100.5	109.5	101.4	101.2	96.9	102.6	98.9	97.7
	HDR-1	72.3	77.1	75.2	73.0	70.0	70.0	64.4	-35.1	70.8	70.7
	HDR-2	74.0	73.3	75.2	77.3	79.2	62.8	68.1	54.9	65.5	65.1
	HDR-3	81.4	75.5	76.2	73.0	74.4	59.7	70.2	62.0	66.6	71.8
	HDR-4	70.6	72.4	76.1	70.8	-37.9	60.8	74.3	58.7	64.2	66.9
	HDR-5	74.2	76.4	77.2	78.9	74.8	66.1	69.9	63.3	72.1	71.4
	HDR-6	72.1	78.9	71.8	70.4	73.6	65.1	75.5	55.8	78.3	64.3
	HDR-7	78.7	79.3	71.5	78.8	74.7	69.0	75.3	60.5	66.7	65.2
	HDR-8	74.2	74.1	74.1	74.6	-38.0	63.2	66.6	54.1	74.3	67.8
	HDR-9	74.6	72.2	77.4	68.0	77.8	64.6	69.9	59.3	71.0	69.0
	HDR-10	69.9	75.9	71.8	72.2	74.4	61.5	75.4	61.4	73.9	70.3
	HDR-11	70.8	76.7	69.0	61.6	77.2	61.3	69.0	58.7	74.3	61.7
	LCS2	94.9	99.0	98.7	104.7	99.2	95.2	103.0	92.7	98.4	105.6
DACT	LCS1	104.0	104.4	98.5	110.8	87.8	99.3	107.2	99.1	97.9	115.7
	HDR-1	181.1	199.1	248.2	152.5	186.2	182.9	251.8	224.6	188.9	214.6
	HDR-2	179.2	164.7	227.4	239.2	144.4	187.9	190.1	263.3	153.7	211.9
	HDR-3	133.1	196.9	202.3	186.0	162.0	173.5	234.9	310.3	150.1	229.2
	HDR-4	198.7	120.2	197.1	157.6	156.3	160.8	154.2	330.7	145.4	174.7
	HDR-5	215.1	157.4	224.0	183.4	184.9	212.6	230.1	162.1	125.4	202.3
	HDR-6	153.4	111.0	162.7	158.7	155.5	168.5	205.3	126.6	126.4	164.2
	HDR-7	154.1	123.2	234.6	158.2	136.1	181.1	202.1	170.9	143.2	184.8
	HDR-8	161.8	187.0	241.1	182.1	121.8	183.3	151.9	201.9	139.6	167.9
	HDR-9	213.3	148.2	178.2	184.4	164.9	165.2	161.0	226.7	124.7	202.3
	HDR-10	181.3	125.6	156.7	120.6	150.2	253.2	178.5	173.0	143.1	231.9
	HDR-11	200.0	187.8	216.1	191.2	175.9	167.3	211.8	177.9	131.2	207.1
	LCS2	89.0	83.9	89.3	91.3	96.0	92.7	82.8	97.0	72.9	74.3
DEA	LCS1	100.2	105.9	104.2	107.8	96.5	97.8	96.2	102.0	96.6	109.8
	HDR-1	86.4	93.6	77.3	88.9	72.3	75.6	88.8	49.4	98.0	258.5

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-2	64.7	97.7	91.9	100.3	84.6	72.5	110.1	40.8	103.8	140.9
	HDR-3	94.7	85.7	97.9	106.9	44.9	47.5	81.8	70.8	95.2	134.9
	HDR-4	99.9	99.3	117.0	152.8	64.8	90.0	83.0	50.1	83.9	121.9
	HDR-5	103.2	89.3	88.7	148.6	98.6	61.9	107.6	75.0	84.7	84.8
	HDR-6	73.6	56.6	109.6	82.1	82.5	68.6	121.3	74.2	99.8	118.6
	HDR-7	105.7	84.9	80.3	80.6	79.7	50.1	110.8	100.7	105.6	115.4
	HDR-8	88.6	67.6	99.9	141.6	76.4	57.3	116.6	61.1	86.2	107.4
	HDR-9	118.9	105.6	109.7	94.3	88.3	64.3	93.0	55.5	113.8	122.9
	HDR-10	69.8	85.4	100.7	109.2	55.8	68.5	122.8	84.9	81.9	105.8
	HDR-11	115.2	110.5	94.9	70.9	54.5	56.5	76.8	76.7	106.2	134.9
	LCS2	98.7	106.1	103.1	101.2	95.5	93.2	106.9	95.4	97.1	109.7
DEET	LCS1	104.6	109.6	103.8	110.2	93.8	96.1	93.0	88.0	94.8	100.2
	HDR-1	81.6	80.8	81.2	88.4	91.7	77.6	90.8	84.0	75.6	85.0
	HDR-2	78.9	88.5	88.9	96.7	84.6	84.4	98.6	76.7	84.0	89.9
	HDR-3	80.7	82.9	83.8	83.6	84.7	67.7	98.6	79.0	81.4	82.3
	HDR-4	79.1	70.4	75.5	86.0	80.8	74.6	92.5	95.4	80.5	80.8
	HDR-5	82.9	77.1	82.6	90.4	86.5	76.1	86.7	105.2	87.3	79.4
	HDR-6	76.1	82.2	85.9	84.2	84.4	78.4	96.0	77.0	78.3	92.2
	HDR-7	85.1	82.7	87.7	85.3	80.0	76.1	96.0	82.9	84.2	86.3
	HDR-8	78.7	78.3	84.9	89.0	82.7	77.7	76.8	81.2	77.0	81.7
	HDR-9	81.7	78.4	79.7	79.2	89.6	83.7	84.7	88.4	82.7	84.0
	HDR-10	72.4	73.2	82.1	86.7	86.3	76.3	94.4	89.1	87.2	81.0
	HDR-11	90.1	78.0	82.1	79.1	83.3	75.6	91.7	80.3	74.0	84.5
	LCS2	95.1	94.8	98.4	100.3	96.6	90.7	91.8	87.3	86.1	91.3
Dehydronifedipine	LCS1	107.2	94.0	96.4	110.1	96.9	96.9	114.0	100.1	100.2	96.4
	HDR-1	82.3	76.0	69.6	80.3	70.4	72.6	78.4	68.1	89.3	88.0
	HDR-2	89.6	83.4	87.4	81.9	75.6	74.0	75.7	71.7	83.8	93.6
	HDR-3	94.9	76.7	73.9	85.8	77.7	69.6	73.6	82.1	87.5	93.6
	HDR-4	90.0	88.0	77.7	84.5	72.8	73.5	73.6	78.7	89.2	84.9
	HDR-5	83.8	73.5	83.0	89.7	76.8	79.0	75.2	77.9	105.0	91.0
	HDR-6	94.9	81.7	86.6	79.3	83.8	76.1	84.8	76.9	93.0	91.0
	HDR-7	95.9	87.5	84.7	82.6	82.1	69.2	81.5	75.9	90.8	91.9
	HDR-8	85.2	75.1	72.2	79.6	76.5	65.3	76.3	73.0	91.8	85.4
	HDR-9	90.4	83.9	81.8	78.1	89.1	75.7	73.1	72.9	100.1	91.4
	HDR-10	90.6	77.8	77.8	82.7	89.7	68.3	86.5	81.5	100.1	97.8
	HDR-11	90.2	79.8	84.2	69.3	89.7	74.4	76.1	70.5	95.8	91.6
	LCS2	122.8	100.9	107.1	109.7	110.4	108.3	107.4	94.8	105.9	107.2
DIA	LCS1	100.1	101.2	101.3	109.2	98.9	101.9	99.5	102.5	95.7	98.8
	HDR-1	81.2	101.6	89.0	65.3	86.9	87.2	102.8	69.5	103.3	118.4
	HDR-2	108.3	107.3	101.1	86.1	74.2	87.0	106.7	96.1	100.2	88.4
	HDR-3	97.3	92.9	71.1	101.3	86.9	76.4	94.8	89.5	98.8	108.6
	HDR-4	92.5	84.1	70.3	123.5	77.5	85.5	103.2	84.6	94.8	81.7
	HDR-5	77.0	94.7	84.1	83.9	105.2	62.2	94.7	87.0	92.0	78.4
	HDR-6	80.2	87.5	82.2	101.9	66.6	70.9	106.2	107.4	113.5	87.6
	HDR-7	77.0	95.3	97.6	84.9	81.6	88.6	91.1	98.4	95.7	111.9
	HDR-8	74.6	76.2	84.9	67.6	72.9	85.3	102.8	89.0	92.2	86.1
	HDR-9	71.9	88.9	96.8	96.3	82.1	65.7	106.9	90.2	109.0	89.8
	HDR-10	71.5	92.6	80.5	81.9	73.0	69.2	106.9	97.2	103.9	93.1

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-11	93.4	81.9	89.2	60.3	93.4	77.4	77.0	66.2	78.3	119.4
	LCS2	94.3	103.1	103.0	101.5	99.8	102.1	100.6	103.5	93.8	96.5
Diazepam	LCS1	99.5	102.3	100.8	111.5	92.8	98.1	96.9	98.9	99.6	105.1
	HDR-1	85.1	89.5	79.8	88.5	85.4	85.3	98.4	91.2	112.8	115.8
	HDR-2	87.7	91.9	92.2	89.7	86.7	86.8	88.7	91.4	106.3	115.7
	HDR-3	91.5	91.2	87.4	98.0	85.6	77.8	89.8	94.9	105.1	113.1
	HDR-4	86.0	89.2	81.4	86.4	74.4	75.3	86.9	94.4	98.2	105.8
	HDR-5	87.7	88.4	87.0	92.2	82.9	85.0	93.8	113.0	109.0	115.1
	HDR-6	82.6	87.0	87.3	89.8	86.4	84.4	94.4	89.5	105.5	117.4
	HDR-7	88.9	91.3	95.7	92.8	85.4	86.8	90.8	89.1	103.1	118.9
	HDR-8	87.0	89.6	89.3	92.9	77.6	77.5	85.9	85.7	98.7	109.7
	HDR-9	87.5	87.4	85.5	82.9	87.9	86.9	88.4	96.5	115.6	109.0
	HDR-10	82.5	88.5	89.9	91.3	83.3	84.6	95.7	86.8	114.0	115.5
	HDR-11	93.0	91.2	85.9	77.0	86.4	83.2	91.5	88.8	109.1	119.9
	LCS2	101.4	106.5	102.1	107.0	97.1	99.1	95.0	105.3	94.7	108.5
Diclofenac- M-H	LCS1	98.5	98.1	98.7	104.8	92.2	97.7	100.1	108.2	137.3	105.6
	HDR-1	103.0	112.7	114.9	110.7	108.2	83.7	130.3	95.3	144.3	114.5
	HDR-2	97.0	96.7	106.1	96.7	86.4	79.7	113.4	100.7	99.1	112.3
	HDR-3	94.4	95.4	98.7	104.7	85.7	77.0	106.1	100.9	128.0	100.9
	HDR-4	94.2	103.5	101.5	111.7	90.6	73.2	100.3	102.5	98.1	107.1
	HDR-5	95.5	101.1	101.2	100.3	89.4	81.9	99.5	106.8	129.3	107.1
	HDR-6	96.5	100.8	98.6	106.2	96.8	79.1	110.2	104.7	137.7	106.8
	HDR-7	99.1	97.1	96.2	100.1	95.5	74.7	101.5	105.1	124.9	101.2
	HDR-8	99.1	99.3	100.1	99.0	98.1	68.1	99.2	105.4	132.1	97.2
	HDR-9	93.5	99.3	98.2	103.0	100.3	82.4	102.5	105.8	137.3	89.6
	HDR-10	95.0	93.7	97.1	95.5	94.9	72.9	101.6	100.1	136.9	109.0
	HDR-11	92.2	94.5	91.5	87.6	92.5	76.1	98.0	103.2	133.2	100.3
	LCS2	97.2	96.1	97.9	101.8	98.4	100.3	104.2	104.7	139.1	105.4
Dilantin - M-H	LCS1	82.5	95.1	87.8	104.5	79.0	81.1	95.1	102.5	97.2	97.9
	HDR-1	78.7	89.2	75.5	82.5	96.5	78.3	100.1	96.5	115.1	91.5
	HDR-2	89.8	90.4	92.7	96.4	99.3	81.1	88.1	77.9	110.2	101.2
	HDR-3	104.0	85.3	81.6	107.5	101.8	82.3	87.5	86.8	132.0	116.6
	HDR-4	94.3	96.5	85.1	103.2	97.1	86.3	102.4	102.2	122.9	101.6
	HDR-5	95.8	92.9	94.7	102.6	103.6	84.4	101.0	94.1	142.8	108.9
	HDR-6	99.8	96.2	98.3	97.3	117.2	79.3	115.3	96.8	167.7	102.8
	HDR-7	94.8	96.5	89.7	107.1	114.2	82.0	110.4	98.4	133.0	106.1
	HDR-8	93.8	82.7	89.2	104.6	103.4	72.3	119.4	93.1	137.4	113.0
	HDR-9	104.4	89.0	89.6	91.6	122.7	83.5	98.2	96.6	121.3	110.0
	HDR-10	104.3	84.0	92.5	97.3	115.0	84.3	126.7	95.1	142.7	102.3
	HDR-11	96.7	95.6	95.6	72.0	128.5	88.7	107.7	85.3	125.8	92.8
	LCS2	75.8	81.1	77.1	86.8	69.9	68.9	98.7	82.3	80.9	92.4
Diltiazem	LCS1	107.8	84.2	106.9	106.4	92.9	96.7	92.4	88.9	95.3	112.7
	HDR-1	181.7	192.9	200.3	236.1	148.5	184.1	179.2	119.1	134.8	134.8
	HDR-2	191.6	230.3	211.3	240.4	135.6	180.5	185.4	119.0	135.8	131.8
	HDR-3	181.4	206.5	207.3	229.3	124.7	174.6	165.1	119.9	127.2	123.7
	HDR-4	176.9	183.2	189.6	229.7	121.4	161.5	146.6	118.9	121.9	114.0
	HDR-5	183.7	211.1	203.7	226.8	128.4	190.1	154.3	151.3	139.7	125.3
	HDR-6	166.7	205.2	207.0	230.0	124.7	190.6	166.0	118.3	128.1	134.1

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-7	179.8	202.0	201.0	235.8	117.5	169.0	172.2	117.6	141.5	131.0
	HDR-8	173.7	200.2	207.9	242.1	114.4	169.2	143.8	105.6	124.4	119.8
	HDR-9	183.8	194.6	199.2	218.3	132.3	194.9	159.9	120.8	169.4	118.3
	HDR-10	162.2	188.1	224.7	228.2	134.6	191.1	163.8	134.6	144.5	122.7
	HDR-11	195.5	194.9	212.6	206.7	134.9	178.8	166.9	112.2	140.6	130.0
	LCS2	108.0	94.0	103.5	117.2	103.2	94.2	94.2	101.6	94.5	107.3
Diuron	LCS1	111.4	100.0	100.1	105.7	92.0	98.1	97.6	101.5	127.1	98.1
	HDR-1	93.0	98.9	88.2	94.8	91.4	88.1	97.2	101.4	123.1	103.3
	HDR-2	95.1	98.7	86.6	90.6	82.9	85.1	100.6	100.1	92.1	96.3
	HDR-3	94.2	95.0	88.9	91.2	82.8	85.4	95.6	104.5	126.2	99.8
	HDR-4	92.8	97.5	87.8	91.0	83.2	86.5	96.0	103.1	102.9	95.9
	HDR-5	94.2	101.4	91.7	92.6	87.1	88.3	103.8	104.0	114.8	101.5
	HDR-6	98.7	96.2	94.9	90.3	92.6	88.9	106.4	105.8	129.8	97.3
	HDR-7	95.1	98.6	94.1	88.1	90.1	83.2	101.8	104.7	120.4	94.2
	HDR-8	95.7	94.5	84.8	89.2	87.7	84.0	99.2	101.9	128.1	104.6
	HDR-9	96.9	99.1	90.1	88.1	93.1	86.5	104.3	107.7	131.6	93.0
	HDR-10	90.7	93.7	86.0	89.6	93.4	83.1	97.4	92.2	132.1	106.0
	HDR-11	96.1	89.7	83.7	75.9	90.4	89.3	101.3	107.5	122.2	94.4
	LCS2	100.9	100.8	91.5	105.7	95.5	97.3	99.0	111.6	123.3	99.2
Erythromycin	LCS1	97.7	78.4	99.4	91.0	104.0	95.4	82.8	95.0	120.4	108.5
	HDR-1	116.7	158.9	135.5	170.9	85.0	209.1	144.0	85.9	103.9	87.6
	HDR-2	96.9	162.2	127.2	148.3	73.8	207.4	148.4	89.0	80.3	83.5
	HDR-3	120.1	162.9	130.6	156.6	70.3	196.6	146.1	97.3	101.1	85.9
	HDR-4	118.8	173.1	149.5	161.5	71.0	189.1	145.0	88.6	73.9	74.6
	HDR-5	115.2	163.6	142.3	159.8	74.7	199.4	147.0	100.0	102.0	80.9
	HDR-6	101.5	181.1	133.1	169.4	81.3	214.5	163.4	101.1	113.6	78.1
	HDR-7	112.7	189.6	144.8	180.5	78.0	209.9	132.8	102.3	98.5	84.8
	HDR-8	112.1	164.4	146.0	180.7	78.1	195.0	130.1	93.5	102.2	66.4
	HDR-9	112.7	190.6	188.3	175.7	85.6	217.8	145.5	94.3	124.2	89.1
	HDR-10	101.9	169.3	156.8	156.6	87.4	197.5	146.2	96.0	117.8	88.6
	HDR-11	104.2	169.1	162.8	119.9	77.9	199.3	144.5	111.1	116.3	82.2
	LCS2	100.3	85.2	96.8	108.7	118.5	96.8	96.2	110.7	123.9	105.5
Estrone	LCS1	96.3	97.9	100.9	111.9	103.5	97.2	87.2	110.6	88.6	98.6
	HDR-1	106.3	99.8	102.4	132.6	110.7	83.1	106.0	111.1	106.2	95.2
	HDR-2	96.7	116.8	112.4	136.3	111.0	86.0	92.3	82.5	119.1	92.8
	HDR-3	117.9	106.7	125.2	147.0	97.3	76.1	93.6	85.8	94.9	102.4
	HDR-4	101.2	98.2	90.7	127.0	81.9	72.1	88.7	99.2	102.8	90.2
	HDR-5	106.7	97.4	112.5	118.3	102.8	92.6	89.8	137.9	128.2	73.0
	HDR-6	98.7	97.7	105.8	124.4	86.5	88.1	124.5	84.3	132.9	95.9
	HDR-7	106.2	111.0	105.9	125.5	100.1	86.5	90.5	104.3	100.0	90.7
	HDR-8	119.3	95.6	110.2	135.4	82.6	79.5	94.0	98.8	99.8	85.6
	HDR-9	107.8	92.4	108.0	117.0	82.7	79.7	94.1	107.4	111.9	87.1
	HDR-10	103.5	103.5	100.7	122.1	91.5	86.0	111.3	133.9	111.8	89.3
	HDR-11	121.1	107.8	95.8	118.7	98.2	82.7	77.9	98.6	127.3	88.4
	LCS2	104.4	95.3	100.5	111.9	97.4	95.0	99.6	101.8	112.3	82.8
Ethylparaben	LCS1	100.2	93.3	93.7	100.2	90.9	98.5	93.0	103.5	130.1	94.8
	HDR-1	103.6	108.7	109.0	117.6	101.8	119.1	113.3	105.8	151.2	125.6
	HDR-2	104.6	103.9	106.8	110.5	88.7	112.2	114.2	108.4	116.5	129.2

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-3	101.7	109.7	106.7	110.5	93.5	93.8	105.3	112.6	156.1	127.8
	HDR-4	105.5	111.0	106.6	115.1	95.7	113.3	109.0	108.1	126.1	121.3
	HDR-5	103.4	105.0	107.5	115.6	94.1	121.9	112.2	122.6	151.5	124.0
	HDR-6	106.6	108.7	107.0	112.9	101.9	119.2	120.3	105.8	166.3	122.3
	HDR-7	106.4	109.3	107.7	112.9	107.1	99.7	111.4	113.8	143.6	120.8
	HDR-8	106.6	103.2	104.2	114.1	102.4	93.5	108.6	110.4	148.2	120.0
	HDR-9	106.4	107.9	102.3	114.2	109.6	116.0	116.3	107.9	166.4	116.9
	HDR-10	109.7	107.4	106.3	108.8	105.4	110.3	114.5	103.1	158.1	132.0
	HDR-11	106.1	107.7	105.2	58.8	101.1	115.4	112.6	113.6	156.5	117.8
	LCS2	96.1	92.1	95.4	104.0	98.4	93.3	105.9	117.1	121.0	99.8
Flumequine	LCS1	97.6	91.9	92.0	109.6	95.4	93.4	96.2	98.6	112.4	94.6
	HDR-1	99.8	117.0	99.9	112.8	86.6	107.9	120.2	112.2	145.9	159.6
	HDR-2	113.4	110.5	107.5	109.5	95.0	100.8	101.6	127.7	135.2	149.7
	HDR-3	108.8	104.2	95.6	113.4	99.3	90.9	107.7	122.9	132.0	141.6
	HDR-4	112.7	107.4	96.0	114.8	86.2	95.0	101.0	127.8	131.2	126.4
	HDR-5	100.2	98.5	102.2	118.8	92.0	97.8	113.1	116.4	138.8	140.6
	HDR-6	105.4	108.1	107.9	113.2	97.7	95.8	109.8	113.4	145.0	132.3
	HDR-7	117.4	103.0	115.9	112.5	97.3	92.4	108.1	111.1	125.0	135.2
	HDR-8	99.0	97.3	95.1	101.4	87.4	87.5	107.5	109.2	125.6	132.5
	HDR-9	106.0	107.6	108.2	107.8	106.2	97.7	102.9	104.7	121.4	153.1
	HDR-10	109.6	94.1	96.9	116.2	114.3	95.1	108.8	155.6	130.7	128.5
	HDR-11	114.7	104.9	115.3	74.4	106.6	100.8	97.0	108.1	116.9	127.7
	LCS2	105.0	98.8	103.1	105.4	100.8	95.9	104.7	91.0	112.4	108.6
Fluoxetine	LCS1	110.8	97.3	108.1	113.4	95.6	97.8	67.3	97.8	101.1	99.0
	HDR-1	136.2	227.6	166.9	203.4	67.1	194.2	75.8	83.0	88.8	84.8
	HDR-2	141.5	188.5	196.9	240.2	66.6	217.6	87.4	77.7	75.3	107.0
	HDR-3	156.9	247.2	278.1	265.4	64.4	193.6	81.8	81.0	77.6	72.9
	HDR-4	134.5	160.8	166.0	208.1	70.6	180.5	60.7	83.7	75.1	68.6
	HDR-5	152.5	130.8	169.2	180.3	63.7	185.5	81.6	103.6	83.9	81.3
	HDR-6	144.1	163.6	191.6	224.1	70.3	183.6	76.3	82.0	122.3	91.4
	HDR-7	164.3	184.5	218.1	216.5	60.4	245.5	100.8	70.8	81.9	116.1
	HDR-8	168.0	227.6	259.3	256.7	64.2	171.1	61.1	75.0	76.6	78.6
	HDR-9	153.8	132.6	215.4	197.1	65.8	174.6	68.4	88.9	82.1	79.9
	HDR-10	145.9	147.1	215.7	249.2	71.4	174.1	72.2	133.9	91.2	82.5
	HDR-11	154.2	155.7	209.7	151.4	72.4	229.5	70.1	85.7	83.1	91.7
	LCS2	113.7	111.9	109.7	106.4	97.1	113.8	70.3	116.4	95.5	127.9
Gemfibrozil	LCS1	104.6	101.7	105.6	101.2	108.8	93.8	98.6	99.5	83.4	111.6
	HDR-1	120.9	109.7	116.3	115.8	81.2	63.8	88.3	94.7	137.2	189.6
	HDR-2	107.5	113.1	119.3	113.7	77.2	66.2	79.3	79.0	137.6	189.7
	HDR-3	117.1	121.0	119.2	111.8	81.2	63.1	85.2	86.6	135.2	230.1
	HDR-4	120.0	110.1	110.4	107.6	86.1	65.7	84.5	93.8	138.8	205.3
	HDR-5	119.4	121.7	114.1	123.4	110.5	72.9	83.6	94.5	142.2	152.0
	HDR-6	102.0	114.5	118.4	119.4	136.7	63.7	90.6	94.7	130.8	215.3
	HDR-7	109.5	116.7	119.8	126.4	134.9	58.6	84.8	76.6	135.9	166.7
	HDR-8	114.5	114.6	121.1	107.6	125.8	60.9	82.8	94.8	129.8	179.1
	HDR-9	117.6	116.5	120.5	110.7	144.1	65.9	87.7	96.9	138.5	187.9
	HDR-10	106.5	113.3	123.4	120.8	143.3	66.1	76.9	43.2	145.6	182.1
	HDR-11	119.5	113.1	116.7	95.5	140.6	64.2	87.7	88.6	143.6	176.3

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	LCS2	107.5	101.3	100.7	108.3	139.8	92.5	107.9	97.4	87.5	93.1
Ibuprofen	LCS1	100.2	106.8	94.1	103.0	87.0	100.1	91.8	102.5	135.6	91.5
	HDR-1	100.3	104.8	95.2	110.5	107.8	90.0	108.9	113.3	146.9	114.2
	HDR-2	99.3	100.5	95.3	102.2	94.8	86.5	105.1	108.8	108.3	117.8
	HDR-3	106.3	103.3	93.0	98.3	89.1	88.5	99.4	111.9	140.7	109.1
	HDR-4	101.1	103.1	98.6	99.6	91.9	85.2	102.0	98.7	123.3	113.0
	HDR-5	96.6	99.9	98.9	101.9	78.7	91.1	100.7	114.9	138.7	113.1
	HDR-6	96.2	101.4	96.9	93.4	80.3	83.8	108.1	118.5	154.5	114.1
	HDR-7	95.0	99.1	99.3	94.8	76.0	88.5	99.4	111.9	140.8	108.1
	HDR-8	100.0	105.4	91.2	104.3	77.2	82.9	96.4	107.8	143.1	107.1
	HDR-9	102.2	99.2	92.2	94.0	81.5	88.1	99.6	109.7	161.9	111.0
	HDR-10	99.4	99.8	99.7	97.6	75.4	83.2	106.7	118.5	150.4	116.5
	HDR-11	101.6	100.8	91.2	84.6	75.8	80.1	99.9	113.9	158.2	108.9
	LCS2	100.1	97.9	93.0	107.7	80.4	96.2	95.8	107.2	129.6	91.4
Iohexol - M+H	LCS1	132.2	95.6	100.1	117.6	85.6	108.8	103.2	120.7	138.5	107.9
	HDR-1	74.4	96.3	84.6	90.3	76.3	75.4	74.5	121.2	171.7	129.6
	HDR-2	101.0	79.6	81.2	93.0	66.6	67.6	68.5	102.9	84.8	105.6
	HDR-3	64.6	67.2	79.0	84.2	68.7	90.9	64.8	104.0	128.2	97.1
	HDR-4	84.2	86.9	86.1	90.7	63.8	95.9	72.7	96.4	117.5	100.5
	HDR-5	73.5	100.9	72.6	85.1	72.7	95.8	86.2	116.3	117.9	106.5
	HDR-6	102.8	87.2	101.7	102.9	59.1	86.5	69.5	93.0	109.7	103.9
	HDR-7	67.5	83.0	75.0	89.0	62.8	79.8	73.8	106.9	115.9	124.2
	HDR-8	88.8	70.9	83.8	93.4	74.3	75.0	83.4	99.4	111.5	108.6
	HDR-9	96.4	73.8	90.1	84.3	62.2	90.1	79.5	107.3	144.2	113.6
	HDR-10	105.3	84.4	105.5	76.8	56.3	76.4	87.0	88.6	162.3	129.9
	HDR-11	107.1	95.0	60.6	40.3	70.4	80.2	76.1	95.1	166.9	120.6
	LCS2	127.7	115.0	126.2	117.0	113.4	97.1	102.4	127.4	132.1	124.3
Iopromide - PRM	LCS1	103.0	93.1	102.8	110.3	94.3	86.0	108.9	88.7	103.1	87.3
	HDR-1	86.0	70.5	52.6	91.1	64.1	83.3	65.6	53.5	103.3	101.5
	HDR-2	98.2	74.1	78.6	99.4	69.0	63.7	66.2	58.2	111.8	111.3
	HDR-3	95.5	57.1	62.4	99.5	73.9	66.8	55.4	72.2	77.8	111.0
	HDR-4	87.6	91.3	74.4	99.1	69.5	80.7	78.0	73.2	99.2	91.0
	HDR-5	97.4	67.2	76.5	111.5	74.5	78.4	59.6	72.2	98.9	97.6
	HDR-6	96.3	92.6	84.3	94.8	78.3	80.6	80.3	82.1	93.7	94.9
	HDR-7	102.6	90.5	77.9	104.1	76.8	75.8	63.1	76.3	85.9	91.2
	HDR-8	88.8	76.2	68.2	91.7	76.6	63.8	73.2	86.3	95.7	102.1
	HDR-9	106.8	90.5	75.6	88.2	92.0	76.3	69.1	71.8	94.5	84.8
	HDR-10	106.5	77.6	76.6	118.7	103.2	70.5	81.1	153.7	99.7	106.2
	HDR-11	102.5	79.0	81.3	49.4	95.7	78.0	63.8	74.7	84.4	89.5
	LCS2	127.1	136.0	136.6	131.5	131.3	111.7	123.7	95.2	123.3	130.2
Isobuylparaben	LCS1	98.2	94.9	101.7	96.5	88.8	96.0	93.8	99.7	124.3	96.3
	HDR-1	99.9	101.5	100.2	104.9	92.5	105.3	129.4	107.8	151.3	118.8
	HDR-2	90.9	96.5	95.6	102.1	89.1	96.0	126.2	106.9	110.2	118.1
	HDR-3	98.1	96.3	92.3	100.1	89.0	98.0	122.7	108.3	139.9	118.8
	HDR-4	97.5	100.6	96.9	100.4	87.0	95.1	120.2	100.7	127.7	105.3
	HDR-5	94.7	100.3	100.8	99.7	88.7	102.2	115.7	110.8	141.2	113.3
	HDR-6	99.2	98.5	98.8	97.1	94.0	98.9	125.1	108.6	162.9	117.9
	HDR-7	94.5	103.2	98.5	98.2	95.2	97.6	118.3	108.5	143.4	116.4

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-8	102.3	92.6	96.4	100.8	94.2	91.7	118.2	107.8	143.9	113.4
	HDR-9	96.5	96.6	95.8	101.6	95.6	104.6	121.4	110.3	165.8	115.3
	HDR-10	92.8	92.4	98.7	96.2	95.4	96.1	115.6	99.0	166.0	119.6
	HDR-11	95.4	100.0	92.6	77.0	91.7	94.7	118.1	104.6	153.8	112.8
	LCS2	95.8	91.7	87.1	97.5	95.0	84.8	103.1	113.9	120.3	94.5
isoproturon	LCS1	101.4	108.7	98.2	109.9	99.8	97.1	106.3	98.9	106.7	96.1
	HDR-1	96.1	99.4	85.2	95.2	101.2	101.5	108.7	89.6	120.5	115.2
	HDR-2	108.7	101.1	103.9	101.0	102.1	98.6	111.7	95.5	123.8	140.3
	HDR-3	113.5	95.8	94.7	103.2	103.6	90.0	101.8	99.1	116.7	125.7
	HDR-4	105.5	107.4	93.2	99.4	106.7	102.4	103.5	99.1	114.4	118.3
	HDR-5	106.9	100.5	94.7	110.6	109.0	110.3	104.0	94.6	131.1	120.9
	HDR-6	112.5	102.1	103.3	92.2	118.3	100.6	111.6	92.5	117.3	131.8
	HDR-7	115.2	102.8	102.9	93.5	114.7	97.9	106.3	91.9	118.2	119.8
	HDR-8	103.3	94.7	92.4	94.1	109.2	89.4	107.6	87.3	117.1	116.4
	HDR-9	115.5	101.3	101.0	93.4	132.7	102.8	97.3	91.5	110.9	117.8
	HDR-10	112.7	101.9	94.5	102.5	128.9	90.4	115.4	106.6	116.9	120.7
	HDR-11	113.1	96.9	103.8	83.8	126.1	100.4	105.4	89.1	109.6	116.0
	LCS2	121.7	111.6	113.3	111.8	116.9	103.3	113.3	92.4	106.1	105.1
Ketoprofen	LCS1	95.4	101.7	94.9	115.3	108.2	93.2	104.8	100.3	103.3	105.6
	HDR-1	67.1	69.6	53.1	73.2	73.9	57.0	62.6	70.4	76.0	73.1
	HDR-2	72.8	75.3	68.3	71.7	75.9	52.0	62.9	82.0	82.5	86.8
	HDR-3	77.1	65.1	60.4	80.5	84.9	48.3	57.8	82.5	77.5	86.8
	HDR-4	76.3	72.8	61.5	75.8	75.6	54.9	71.8	85.2	78.6	83.7
	HDR-5	78.3	64.4	60.3	83.5	77.1	55.5	61.1	75.7	80.5	81.9
	HDR-6	79.0	77.0	71.1	74.4	87.6	58.4	74.8	72.6	83.4	88.6
	HDR-7	82.1	72.9	67.0	76.1	82.1	56.6	67.0	74.9	85.4	75.7
	HDR-8	75.6	61.6	57.7	73.7	84.0	47.5	69.9	78.1	79.0	67.8
	HDR-9	78.2	71.4	59.1	73.0	89.6	56.5	62.1	83.1	74.6	77.3
	HDR-10	75.8	67.9	60.1	76.8	86.9	49.9	75.2	63.5	81.1	83.2
	HDR-11	71.1	68.2	65.3	56.2	88.4	57.3	59.6	72.8	70.1	79.7
	LCS2	93.7	81.2	79.1	87.6	104.6	97.2	86.6	86.4	90.3	88.4
Ketorolac	LCS1	98.5	101.4	94.3	112.9	107.7	89.6	107.6	96.0	98.4	107.9
	HDR-1	66.9	70.7	57.3	71.8	76.7	52.8	68.5	62.3	73.8	79.9
	HDR-2	79.4	66.7	63.1	72.7	60.1	45.0	57.8	55.9	70.1	74.8
	HDR-3	76.5	59.9	59.8	66.5	63.1	46.4	56.8	61.0	67.9	93.2
	HDR-4	65.7	63.9	56.2	67.8	70.7	43.0	55.6	75.7	73.1	80.5
	HDR-5	62.5	63.4	67.1	80.3	76.8	55.5	60.6	59.7	73.4	78.2
	HDR-6	70.1	70.2	69.0	71.3	80.2	51.0	61.1	56.9	69.1	85.5
	HDR-7	72.9	71.1	63.1	70.4	85.4	46.2	61.5	64.2	68.2	78.8
	HDR-8	64.7	63.7	64.3	62.9	70.2	42.6	57.9	50.6	69.4	80.3
	HDR-9	64.6	70.2	67.4	63.8	86.7	50.2	55.0	58.9	68.9	73.8
	HDR-10	73.6	58.9	63.5	76.0	86.3	49.7	62.8	58.8	77.2	79.3
	HDR-11	72.7	60.9	65.4	67.8	83.9	47.4	55.6	68.5	60.7	73.2
	LCS2	93.9	91.5	90.8	93.4	120.0	97.3	89.7	87.1	95.4	119.9
Lidocaine	LCS1	100.3	101.6	94.9	110.2	101.1	96.8	104.0	100.3	94.0	105.3
	HDR-1	88.6	103.6	84.2	104.9	90.6	68.8	117.0	85.6	75.3	107.3
	HDR-2	102.7	102.6	97.7	126.1	83.3	74.2	110.3	86.9	69.5	109.7
	HDR-3	112.9	100.2	100.8	129.2	91.3	75.5	99.1	98.3	77.3	99.7

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-4	89.8	104.2	89.9	113.8	92.5	70.9	98.6	92.9	65.0	96.7
	HDR-5	101.9	94.5	96.4	121.1	92.2	85.4	102.6	82.2	82.6	100.3
	HDR-6	95.5	111.0	91.7	117.4	88.4	82.0	125.1	88.3	80.7	96.8
	HDR-7	105.0	109.2	95.7	113.8	99.9	75.9	97.1	82.0	71.9	88.7
	HDR-8	93.5	93.1	89.5	120.4	90.7	70.3	90.6	78.2	74.8	84.8
	HDR-9	108.1	103.5	105.5	110.9	116.2	88.4	110.1	94.8	81.5	102.0
	HDR-10	106.1	104.6	104.4	130.1	106.2	76.7	112.2	125.8	72.2	107.6
	HDR-11	99.4	97.4	98.3	97.9	108.3	82.3	103.9	85.8	67.4	108.1
	LCS2	123.0	115.4	106.3	115.1	125.0	102.5	119.6	102.6	101.7	140.3
Lincomycin	LCS1	99.4	90.1	99.1	108.5	81.6	89.2	86.7	91.1	115.6	108.5
	HDR-1	112.4	147.9	139.1	131.2	86.1	120.4	126.7	111.3	117.1	132.1
	HDR-2	126.8	134.3	136.4	154.4	127.6	140.6	110.9	161.2	130.4	122.0
	HDR-3	121.2	74.0	122.9	184.2	96.8	93.4	118.1	165.0	104.9	143.7
	HDR-4	92.1	138.6	117.4	145.8	105.2	134.0	93.7	132.5	137.8	111.5
	HDR-5	108.5	102.6	119.4	166.5	99.5	164.2	92.9	134.9	132.6	139.9
	HDR-6	85.5	143.3	134.1	136.0	83.8	142.6	99.2	130.0	117.8	126.7
	HDR-7	104.5	106.7	131.5	156.4	122.6	136.2	99.1	156.4	99.9	139.5
	HDR-8	79.6	139.2	138.0	158.1	97.3	112.6	87.9	116.9	118.0	136.8
	HDR-9	120.8	77.6	173.9	136.9	85.3	131.1	99.1	108.3	109.5	120.1
	HDR-10	90.0	120.4	107.3	137.2	117.5	118.2	98.5	173.8	142.8	115.8
	HDR-11	71.8	126.5	92.4	80.4	100.6	119.7	94.4	154.7	131.8	114.0
	LCS2	106.9	100.6	104.9	106.6	121.2	95.4	96.6	94.0	152.7	127.7
Linuron	LCS1	104.0	99.3	105.7	104.4	93.4	101.3	89.3	104.4	127.2	96.6
	HDR-1	95.4	88.6	92.1	88.1	86.0	80.9	92.1	101.1	155.0	110.4
	HDR-2	92.1	86.8	97.0	88.5	77.7	75.2	98.0	102.5	101.9	113.0
	HDR-3	90.4	87.1	90.8	88.2	80.2	70.0	91.5	103.5	138.4	106.0
	HDR-4	87.2	91.3	90.3	91.5	78.4	75.2	85.8	99.5	123.0	110.5
	HDR-5	90.4	94.6	86.3	88.1	81.7	80.7	93.9	105.6	130.7	114.7
	HDR-6	95.6	88.3	92.5	87.4	83.5	77.8	97.9	110.8	142.7	109.0
	HDR-7	91.3	85.8	92.5	85.4	85.0	76.3	89.8	102.4	138.9	102.9
	HDR-8	89.3	85.6	88.5	87.3	82.5	74.9	85.9	109.8	144.1	103.1
	HDR-9	88.7	90.4	92.9	84.4	90.1	75.5	88.6	108.1	147.3	102.1
	HDR-10	90.5	84.6	88.3	88.8	79.7	71.9	88.5	101.3	158.8	102.7
	HDR-11	89.4	87.9	91.9	65.1	82.9	69.9	92.1	110.1	150.3	103.0
	LCS2	104.7	94.7	101.5	98.3	97.1	100.8	94.6	112.4	131.2	97.3
Lopressor-Metoprolol	LCS1	112.9	103.7	100.7	104.3	94.6	109.0	97.4	110.8	125.9	125.3
	HDR-1	110.8	112.9	92.8	114.2	99.5	104.0	131.0	111.6	124.0	108.7
	HDR-2	102.3	118.9	104.9	105.4	93.3	96.7	124.2	110.1	92.0	116.0
	HDR-3	112.8	112.5	107.6	108.2	93.4	100.3	137.0	113.2	119.4	122.3
	HDR-4	116.2	125.3	106.0	111.7	101.1	94.2	119.9	114.3	109.6	107.7
	HDR-5	112.8	113.1	110.4	117.2	101.4	92.3	124.3	133.1	126.0	124.1
	HDR-6	108.2	115.0	108.2	107.9	105.5	93.3	130.3	121.8	135.1	123.6
	HDR-7	119.2	116.6	108.0	119.3	105.1	92.1	118.4	128.1	106.2	114.0
	HDR-8	110.1	114.0	112.6	115.5	105.4	90.7	125.5	113.5	131.2	117.5
	HDR-9	123.7	105.6	114.9	108.8	107.6	103.6	133.0	131.9	142.2	117.3
	HDR-10	123.5	117.4	113.0	108.6	112.2	85.9	131.1	137.1	135.7	130.7
	HDR-11	111.0	115.1	112.9	87.3	104.9	95.3	132.1	127.2	135.8	131.9
	LCS2	116.2	111.5	97.2	109.5	98.5	106.3	104.9	120.9	114.7	132.9

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
Meclofenamic Acid	LCS1	98.4	96.2	97.6	107.0	92.4	97.4	100.1	108.3	137.3	105.7
	HDR-1	102.9	109.7	114.0	112.8	108.3	83.5	130.3	95.3	144.3	114.6
	HDR-2	97.5	94.2	106.0	97.5	86.5	79.5	113.4	100.7	99.2	112.4
	HDR-3	94.5	92.7	98.0	106.5	85.9	76.9	106.3	100.9	128.0	101.0
	HDR-4	94.1	103.7	100.5	112.2	90.7	73.1	100.3	102.5	98.1	107.2
	HDR-5	95.4	98.3	100.2	104.4	89.6	81.7	99.4	106.8	129.4	107.2
	HDR-6	96.5	97.2	97.6	105.9	96.9	79.0	110.2	104.7	137.7	106.9
	HDR-7	99.0	93.8	95.3	102.5	95.6	74.6	101.5	105.1	124.9	101.3
	HDR-8	99.1	96.2	100.6	97.7	98.2	68.0	99.2	105.4	132.1	97.3
	HDR-9	93.4	95.7	97.2	104.4	100.5	82.3	102.8	105.8	137.3	89.7
	HDR-10	94.9	92.2	96.3	95.0	95.0	73.3	101.6	100.1	136.9	109.1
	HDR-11	92.1	92.1	90.6	86.5	92.6	75.9	98.0	103.2	133.2	100.4
	LCS2	97.2	92.7	97.5	102.4	98.5	100.1	104.2	104.7	139.1	105.5
Meprobamate	LCS1	102.4	93.4	95.4	114.0	110.9	92.5	104.3	99.4	101.2	111.6
	HDR-1	103.6	77.9	95.0	61.9	104.7	240.8	99.1	101.9	71.9	76.2
	HDR-2	126.4	107.8	138.8	70.4	75.5	191.0	62.1	43.4	97.1	53.3
	HDR-3	93.8	77.7	69.6	106.1	88.4	262.9	67.1	86.6	65.5	31.7
	HDR-4	74.0	107.1	63.1	145.4	106.8	169.3	75.1	97.3	75.8	41.9
	HDR-5	90.5	69.5	122.0	57.8	107.2	194.3	90.9	77.2	94.4	61.2
	HDR-6	104.4	100.9	118.4	92.0	54.6	264.1	40.5	72.6	75.0	50.0
	HDR-7	74.8	99.6	98.2	89.0	107.9	212.9	67.1	74.4	76.4	76.5
	HDR-8	98.4	72.4	120.9	80.9	131.4	169.8	80.2	87.4	81.9	71.0
	HDR-9	115.6	130.0	129.0	91.5	73.4	177.5	78.1	91.4	82.3	62.1
	HDR-10	95.3	115.0	123.2	113.5	95.1	192.4	86.2	73.9	66.6	38.4
	HDR-11	111.1	92.3	123.9	73.7	112.2	154.0	76.6	81.9	78.6	51.4
	LCS2	121.1	116.9	119.4	126.4	133.5	110.9	123.7	104.7	108.6	110.2
Metazachlor	LCS1	91.5	100.7	94.8	112.8	98.6	94.4	105.1	92.0	104.7	115.2
	HDR-1	61.4	65.1	49.6	47.9	30.4	16.9	10.4	5.1	3.9	-1.6
	HDR-2	67.1	63.2	54.3	53.6	32.8	16.2	10.8	5.4	4.3	-2.2
	HDR-3	73.1	61.1	51.3	53.5	36.0	14.7	9.8	5.7	4.1	-2.3
	HDR-4	70.9	66.8	51.7	53.4	35.2	16.5	9.4	4.2	4.2	-2.4
	HDR-5	72.2	59.4	53.5	58.7	33.9	16.2	8.9	5.1	5.0	-1.9
	HDR-6	73.8	63.3	57.7	52.3	35.4	16.4	9.3	4.2	4.5	-1.9
	HDR-7	72.9	65.0	53.6	51.2	34.9	14.8	10.5	5.0	5.0	-2.3
	HDR-8	67.4	64.6	50.9	52.9	32.6	13.2	9.1	4.5	4.1	-2.2
	HDR-9	72.1	65.3	51.4	52.0	38.9	16.3	8.9	5.9	3.8	-2.2
	HDR-10	75.5	66.0	47.4	57.0	41.3	14.5	8.7	3.4	6.3	-2.4
	HDR-11	71.1	66.6	53.1	40.5	38.8	15.6	10.3	3.2	3.8	-2.1
	LCS2	111.2	106.3	93.9	105.2	114.1	101.0	110.1	87.8	106.1	122.0
Metformin	LCS1	90.1	87.4	105.4	112.9	120.3	88.1	101.0	106.4	110.4	112.5
	HDR-1	174.5	125.6	165.6	154.1	128.7	121.7	121.2	165.0	140.9	143.5
	HDR-2	195.4	136.8	155.1	151.2	166.6	133.4	133.4	118.4	140.7	162.5
	HDR-3	170.3	123.3	181.8	245.6	136.9	117.6	149.9	129.3	103.7	181.3
	HDR-4	140.4	96.7	122.6	105.0	136.7	115.6	128.0	78.7	108.7	164.1
	HDR-5	122.0	172.6	166.5	197.9	159.9	161.1	172.0	95.8	117.8	160.0
	HDR-6	134.4	128.3	143.5	147.4	131.6	189.4	132.1	81.5	150.0	164.0
	HDR-7	167.6	159.4	131.8	152.7	147.1	163.3	125.3	105.5	114.6	200.8
	HDR-8	160.6	133.7	250.2	170.6	133.6	135.5	170.7	116.7	166.2	130.0

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-9	117.1	133.1	210.3	133.9	117.2	125.2	124.3	96.9	129.2	155.8
	HDR-10	149.2	120.5	140.0	150.0	158.6	143.2	124.9	161.7	126.6	174.1
	HDR-11	193.2	159.6	135.1	N/A	153.6	119.3	137.4	79.2	124.3	179.4
	LCS2	110.8	72.4	81.2	116.5	103.6	80.8	122.6	91.2	94.4	107.0
Methylparaben - M-H	LCS1	96.7	97.1	93.4	105.9	89.1	93.2	92.5	99.9	127.8	91.1
	HDR-1	117.9	141.0	131.0	134.9	130.4	112.7	155.2	119.5	167.5	127.0
	HDR-2	122.9	122.8	107.7	118.6	104.7	125.2	127.2	122.7	125.4	119.5
	HDR-3	129.4	125.6	117.1	111.6	110.8	107.7	143.1	114.3	161.2	120.5
	HDR-4	121.7	133.5	105.9	127.9	112.6	114.9	129.1	116.7	138.1	114.1
	HDR-5	118.7	126.2	113.2	109.3	114.5	125.7	131.6	124.6	152.9	126.5
	HDR-6	124.5	131.5	130.9	128.9	124.3	112.6	140.5	130.9	171.7	100.2
	HDR-7	129.0	123.8	103.1	118.4	117.8	109.8	144.6	127.8	153.3	125.0
	HDR-8	118.4	103.6	111.7	119.1	116.5	114.1	140.7	117.6	161.8	106.5
	HDR-9	133.2	126.5	124.9	130.4	122.4	108.9	142.7	127.2	189.1	132.0
	HDR-10	123.9	114.3	116.4	129.3	125.2	111.5	149.9	122.4	168.4	121.4
	HDR-11	127.4	117.7	111.2	84.9	110.3	106.1	149.7	122.6	161.6	111.3
	LCS2	97.0	96.3	85.9	107.6	99.9	90.3	107.3	113.7	126.4	88.9
Metolachlor	LCS1	105.0	101.0	104.1	108.2	95.3	102.8	102.9	105.7	100.8	96.6
	HDR-1	85.8	88.5	75.8	76.4	61.9	42.4	39.1	25.6	26.6	18.7
	HDR-2	90.5	90.5	84.9	80.4	58.6	43.7	41.0	25.5	25.3	18.3
	HDR-3	91.9	84.7	82.8	79.9	57.0	39.9	38.2	26.4	25.5	17.9
	HDR-4	88.5	80.5	80.1	76.7	54.0	39.4	35.5	25.3	24.0	15.7
	HDR-5	91.1	84.3	81.1	78.8	58.2	45.3	37.8	30.5	27.9	17.4
	HDR-6	86.7	86.9	81.8	78.2	60.2	43.3	40.0	25.8	25.7	18.8
	HDR-7	92.5	90.0	84.6	80.1	56.3	41.7	40.0	27.1	25.1	18.4
	HDR-8	88.8	85.3	81.7	79.0	54.8	40.7	35.4	25.1	25.1	17.3
	HDR-9	93.8	84.3	78.2	76.3	62.0	45.0	38.2	25.3	27.0	17.2
	HDR-10	84.6	82.0	83.3	78.8	59.3	43.8	37.1	29.1	28.1	18.4
	HDR-11	101.7	84.4	78.6	62.3	57.7	42.8	40.7	25.1	26.2	17.6
	LCS2	107.5	100.8	104.3	105.2	102.9	98.1	100.7	98.4	94.2	95.1
Naproxen	LCS1	106.8	95.1	98.0	107.5	91.0	89.9	99.8	102.4	123.1	93.0
	HDR-1	119.1	126.7	107.2	127.5	116.1	107.3	156.6	134.1	150.7	155.8
	HDR-2	117.6	111.5	124.3	123.1	88.3	94.5	128.4	134.2	100.5	119.5
	HDR-3	124.4	124.8	122.7	106.4	96.0	90.4	123.3	134.0	158.2	132.4
	HDR-4	121.5	113.2	109.9	120.8	96.8	87.6	110.0	119.9	113.1	130.0
	HDR-5	134.1	118.6	125.6	127.0	94.6	104.5	132.3	129.2	144.1	115.8
	HDR-6	128.7	112.2	108.3	119.0	114.3	94.7	111.2	126.9	147.0	127.8
	HDR-7	123.9	125.6	115.7	119.5	114.0	86.4	117.6	129.5	132.1	121.7
	HDR-8	130.8	113.1	112.2	115.7	111.0	94.4	120.9	120.2	125.7	111.4
	HDR-9	125.1	108.5	129.2	130.6	109.3	103.3	116.9	127.1	159.0	112.0
	HDR-10	119.4	113.1	108.7	105.7	101.6	94.1	117.5	145.9	161.8	128.1
	HDR-11	126.8	115.2	106.4	89.5	98.5	96.7	112.3	145.4	130.8	108.7
	LCS2	99.2	92.2	97.5	103.2	102.2	90.8	96.8	109.8	116.3	98.5
Nifedipine	LCS1	36.2	80.4	72.9	91.8	52.5	70.1	71.6	86.0	85.2	89.4
	HDR-1	98.3	116.3	118.3	163.6	144.2	105.8	157.2	134.1	247.4	125.0
	HDR-2	104.5	115.1	117.5	163.3	142.0	101.6	167.5	140.6	228.0	137.9
	HDR-3	103.0	128.0	131.0	165.0	155.1	105.5	173.6	141.1	255.6	137.6
	HDR-4	109.7	128.4	123.4	175.3	149.4	97.4	178.7	136.0	209.8	127.1

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-5	106.9	126.5	135.6	173.4	150.0	108.2	178.8	147.9	262.8	147.4
	HDR-6	109.1	120.8	137.6	167.1	169.6	106.8	190.2	149.3	279.1	151.7
	HDR-7	108.6	119.7	128.7	171.0	168.1	106.7	180.5	151.0	256.7	136.0
	HDR-8	110.6	123.4	124.2	175.7	156.7	97.8	184.7	146.2	261.9	137.6
	HDR-9	111.1	127.3	122.2	172.7	171.6	113.0	186.8	148.2	292.9	138.0
	HDR-10	101.7	130.4	121.6	162.8	168.3	96.4	199.2	122.9	287.4	139.4
	HDR-11	103.5	127.0	122.0	125.3	160.2	103.9	188.6	150.6	278.2	136.4
	LCS2	28.4	53.4	50.3	54.8	42.6	41.7	63.5	85.9	73.5	66.8
Nonyl-phenol	LCS1	72.9	86.1	101.1	111.9	98.5	69.5	76.9	96.9	107.8	84.4
	HDR-1	117.0	226.0	214.2	305.7	91.8	200.0	243.1	129.1	156.9	180.4
	HDR-2	125.4	232.2	224.8	290.9	79.4	158.0	221.1	155.6	163.8	159.1
	HDR-3	118.9	190.5	207.4	296.5	69.5	164.0	217.5	152.0	171.3	126.0
	HDR-4	120.9	225.3	232.9	316.0	82.8	171.5	175.3	119.8	152.2	111.9
	HDR-5	117.9	202.6	231.6	324.0	83.0	186.2	200.6	138.8	169.0	142.8
	HDR-6	120.4	216.5	233.0	281.7	85.9	182.9	226.8	150.2	177.4	150.3
	HDR-7	115.2	235.3	225.2	276.7	78.2	175.4	185.8	136.0	140.5	128.0
	HDR-8	107.9	180.1	217.8	256.4	66.3	143.4	201.4	120.6	157.3	120.1
	HDR-9	108.4	235.0	288.9	265.5	96.8	192.5	208.2	149.9	167.9	150.1
	HDR-10	111.3	198.0	252.3	293.5	96.9	156.7	240.8	211.4	158.8	141.4
	HDR-11	124.7	240.7	259.5	223.5	93.3	169.6	195.3	129.6	156.1	113.4
	LCS2	71.5	85.0	113.0	112.7	93.3	97.1	118.9	98.7	122.3	93.3
Norethisterone	LCS1	95.5	103.4	93.0	106.5	92.3	104.4	96.2	107.9	108.6	97.2
	HDR-1	75.2	95.1	77.1	101.2	83.5	74.8	102.9	103.9	103.7	105.4
	HDR-2	94.2	97.4	95.5	114.0	93.5	83.8	92.8	111.0	92.9	106.5
	HDR-3	88.2	89.9	79.8	124.7	86.1	67.2	94.6	106.4	89.7	95.2
	HDR-4	84.5	103.0	89.9	110.6	78.1	72.9	102.9	115.7	79.3	91.7
	HDR-5	82.5	93.9	85.2	122.8	110.9	77.4	99.7	116.9	105.6	101.6
	HDR-6	99.1	92.3	89.0	100.1	103.4	89.3	105.9	104.5	105.2	100.2
	HDR-7	91.1	99.0	83.9	108.8	111.5	77.2	95.4	110.2	100.4	113.0
	HDR-8	85.8	84.3	80.2	107.6	101.8	68.0	85.0	102.2	91.7	100.1
	HDR-9	100.7	92.1	93.0	111.4	130.6	80.2	97.1	117.2	87.2	106.8
	HDR-10	102.4	92.3	76.1	113.9	113.9	73.8	100.6	282.6	89.5	121.1
	HDR-11	96.0	90.8	81.1	49.9	115.0	76.0	110.9	111.4	96.6	102.4
	LCS2	106.2	110.1	102.8	117.7	138.7	124.1	124.8	126.7	109.2	116.8
Oxolinic Acid	LCS1	100.4	101.9	95.5	112.7	100.1	92.2	98.8	90.0	105.4	95.1
	HDR-1	84.1	111.4	83.6	87.8	104.0	92.5	124.8	117.3	134.5	132.6
	HDR-2	83.2	109.1	112.9	97.3	108.2	89.6	114.2	126.6	123.7	143.6
	HDR-3	101.0	109.5	102.3	101.7	105.9	91.9	119.3	141.8	121.4	140.9
	HDR-4	86.5	121.8	100.2	100.5	107.9	96.2	117.5	134.1	123.5	125.3
	HDR-5	85.1	109.9	116.8	93.6	109.7	99.8	108.4	136.8	144.0	127.1
	HDR-6	85.3	119.2	114.5	105.8	120.2	107.0	134.2	132.0	135.6	136.2
	HDR-7	80.7	109.0	112.7	116.7	113.0	100.1	119.8	120.6	120.0	147.8
	HDR-8	82.7	111.4	88.5	112.1	114.6	88.8	123.8	122.3	115.1	132.6
	HDR-9	98.3	118.4	103.4	118.1	141.6	103.2	119.5	127.8	120.0	135.9
	HDR-10	97.5	107.4	109.9	118.3	129.6	93.0	119.7	149.6	125.8	144.8
	HDR-11	89.4	117.6	114.7	102.3	136.6	104.4	125.2	130.6	119.1	134.6
	LCS2	128.4	116.5	123.7	121.6	120.3	101.2	121.2	95.6	115.9	122.7
Paraxanthine	LCS1	101.6	93.7	93.2	104.9	101.8	94.7	100.1	103.9	94.1	86.1

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-1	50.4	41.5	47.2	45.6	64.8	43.4	70.8	64.5	84.8	85.0
	HDR-2	60.1	42.5	51.7	37.3	53.2	55.9	80.7	71.8	101.4	78.2
	HDR-3	61.1	44.9	43.6	61.8	59.1	48.0	71.8	63.5	75.1	83.6
	HDR-4	60.2	45.6	35.1	44.9	58.9	53.2	74.2	66.5	77.4	75.7
	HDR-5	66.5	42.7	43.2	35.1	53.3	65.2	77.5	79.2	83.7	71.1
	HDR-6	54.5	46.8	44.0	38.7	56.5	63.9	94.2	78.8	78.3	72.4
	HDR-7	59.2	52.5	43.7	40.3	52.4	65.2	84.4	79.6	78.7	100.8
	HDR-8	46.4	53.9	44.1	43.3	55.2	58.0	63.9	60.8	68.3	74.1
	HDR-9	57.0	50.0	50.5	46.1	60.1	68.5	71.8	66.5	73.4	85.2
	HDR-10	56.9	44.1	39.7	44.4	49.3	44.2	77.6	138.8	84.3	58.1
	HDR-11	45.0	50.5	41.9	34.6	63.7	65.6	78.3	82.7	81.9	59.2
	LCS2	84.7	86.6	88.2	86.3	92.7	111.2	108.9	91.0	86.7	86.7
Pentoxifylline	LCS1	90.6	104.1	97.8	110.4	97.4	94.7	106.8	92.6	107.5	102.4
	HDR-1	49.9	63.2	60.8	65.0	69.9	40.5	87.5	46.1	70.6	72.9
	HDR-2	68.3	93.2	64.1	61.9	59.3	50.8	93.7	56.5	88.0	66.6
	HDR-3	63.6	73.5	66.9	56.9	69.1	48.1	98.7	72.2	67.0	68.7
	HDR-4	56.2	89.9	69.6	77.4	58.7	54.3	86.7	49.9	79.9	68.4
	HDR-5	57.1	79.5	64.1	72.1	69.2	61.3	90.6	62.3	82.6	69.0
	HDR-6	63.2	85.5	62.9	65.0	81.9	62.0	97.0	61.0	83.5	69.0
	HDR-7	60.6	93.1	85.7	82.3	87.3	61.2	94.4	60.4	75.9	99.3
	HDR-8	58.9	72.3	64.2	68.2	70.4	52.8	95.2	52.4	63.0	82.1
	HDR-9	57.3	74.2	79.5	76.8	79.6	58.2	89.1	72.0	84.4	79.5
	HDR-10	71.5	76.0	83.9	89.3	94.0	62.9	84.4	97.1	64.3	70.3
	HDR-11	66.6	85.0	81.3	57.7	82.5	65.1	99.4	66.2	80.0	71.0
	LCS2	122.8	115.9	108.3	122.6	101.6	103.9	132.2	96.5	124.7	123.9
Phenazone	LCS1	102.6	100.2	95.0	105.6	95.4	93.7	98.1	94.3	94.7	98.7
	HDR-1	104.7	119.6	99.5	97.1	108.2	79.6	127.9	74.8	101.5	90.3
	HDR-2	105.0	122.4	114.7	121.6	103.3	84.2	118.7	87.1	85.7	100.4
	HDR-3	109.3	105.4	102.9	114.7	116.8	85.0	111.9	98.2	82.0	89.5
	HDR-4	112.6	121.7	109.9	95.6	107.2	89.4	121.6	98.6	89.7	87.1
	HDR-5	119.9	118.1	118.3	125.5	110.8	99.6	123.1	81.1	88.4	104.2
	HDR-6	121.7	107.8	123.5	110.6	123.3	95.6	112.7	92.0	90.9	108.9
	HDR-7	109.4	130.6	119.9	124.7	111.8	83.0	113.7	92.5	85.3	98.0
	HDR-8	97.1	117.4	109.9	104.6	103.9	82.8	105.7	82.0	84.7	111.3
	HDR-9	117.2	112.9	126.3	104.0	116.3	88.1	107.3	97.2	89.2	112.3
	HDR-10	107.3	104.9	103.0	101.3	133.0	76.9	130.9	129.4	89.8	123.8
	HDR-11	114.9	108.5	121.5	101.2	134.6	91.6	124.2	80.2	79.8	103.7
	LCS2	135.1	128.2	118.1	120.2	117.8	104.9	123.5	94.0	101.8	122.9
Primidone	LCS1	99.8	97.9	89.2	122.3	100.0	108.3	124.3	103.2	89.7	111.4
	HDR-1	29.9	54.3	42.7	57.5	47.8	27.8	50.7	57.6	33.4	48.3
	HDR-2	39.6	58.2	54.7	61.6	31.2	37.0	47.9	62.5	34.0	65.1
	HDR-3	32.1	44.9	53.5	55.4	36.8	25.3	37.2	68.3	28.8	51.8
	HDR-4	42.7	60.1	45.0	67.4	26.8	37.3	44.8	61.9	30.5	59.7
	HDR-5	45.2	52.9	46.8	59.7	40.6	32.8	41.8	73.8	33.1	48.0
	HDR-6	41.1	56.1	49.4	57.0	50.4	34.6	52.5	64.0	25.4	56.0
	HDR-7	52.1	56.1	46.6	72.2	36.0	26.7	23.5	60.1	26.4	40.5
	HDR-8	31.1	43.7	44.7	65.1	52.2	19.1	44.6	51.7	22.9	45.9
	HDR-9	65.5	43.4	42.5	51.9	56.1	32.8	46.3	58.9	23.6	55.9

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-10	49.2	63.7	45.6	60.6	46.0	20.8	48.7	88.9	26.3	64.5
	HDR-11	43.3	63.4	44.5	40.7	47.1	32.4	44.9	83.5	28.8	52.3
	LCS2	91.3	109.1	86.2	103.8	129.7	96.7	126.0	117.2	86.9	108.2
Progesterone	LCS1	116.2	91.7	99.3	111.2	107.7	103.6	127.6	109.7	99.2	107.7
	HDR-1	98.9	95.7	80.1	113.7	87.8	67.7	110.2	99.2	102.1	95.2
	HDR-2	92.0	100.2	108.5	115.1	78.7	79.1	114.5	91.0	96.2	99.7
	HDR-3	90.6	98.3	84.2	129.9	92.6	62.5	103.9	112.4	87.4	85.9
	HDR-4	97.4	79.6	78.2	107.4	85.3	68.1	90.4	102.8	104.9	78.0
	HDR-5	81.9	87.2	78.0	123.9	83.5	76.6	111.0	132.5	101.2	89.9
	HDR-6	85.8	97.8	90.0	110.0	86.8	71.5	132.8	117.3	103.4	117.0
	HDR-7	116.7	103.6	90.5	117.9	82.7	82.8	111.6	94.7	106.2	91.1
	HDR-8	94.6	87.1	88.6	112.0	76.6	79.7	123.2	97.6	85.0	86.2
	HDR-9	99.2	86.5	92.1	111.5	85.2	78.2	131.5	103.4	108.1	96.3
	HDR-10	93.6	80.3	92.2	109.0	86.4	67.7	109.2	94.4	106.1	90.5
	HDR-11	102.3	95.6	80.5	84.7	101.1	81.6	113.8	92.9	106.7	100.3
	LCS2	100.4	103.9	101.9	117.6	108.4	85.2	139.7	105.6	106.9	99.3
Propazine	LCS1	96.4	101.3	102.9	108.0	102.3	94.9	100.6	99.4	102.7	92.2
	HDR-1	85.5	93.8	71.8	84.0	68.5	68.5	79.6	80.6	110.0	84.2
	HDR-2	94.5	100.4	86.1	81.7	85.8	77.8	86.7	84.8	117.1	94.4
	HDR-3	99.2	84.0	80.9	100.2	88.0	71.3	82.7	103.1	116.1	101.2
	HDR-4	94.7	95.9	82.2	90.1	84.4	81.1	89.1	104.2	121.7	92.6
	HDR-5	94.4	89.1	91.5	90.8	92.3	91.7	88.3	93.7	131.9	102.8
	HDR-6	101.9	90.5	93.3	90.2	101.5	86.1	95.8	96.1	122.4	108.0
	HDR-7	96.4	90.5	95.4	95.0	104.5	81.5	98.4	93.5	112.0	99.1
	HDR-8	90.9	89.3	85.8	89.3	96.1	74.0	95.0	90.7	118.0	102.9
	HDR-9	95.6	90.8	86.9	90.8	107.6	82.4	93.1	90.8	113.4	101.1
	HDR-10	98.6	90.4	86.7	100.3	111.5	72.5	103.0	59.5	122.5	109.7
	HDR-11	103.2	93.0	93.6	54.2	117.4	83.5	93.2	84.9	113.5	100.7
	LCS2	113.6	115.6	113.8	116.3	131.9	95.1	121.1	97.0	106.0	111.2
Propylparaben	LCS1	100.0	95.8	97.0	103.5	90.9	99.0	91.2	98.9	126.9	97.7
	HDR-1	95.1	97.1	93.5	106.4	102.2	104.8	122.2	104.7	164.0	128.8
	HDR-2	98.3	94.0	94.8	104.9	87.3	101.4	123.1	108.8	114.5	124.9
	HDR-3	95.1	101.3	94.2	98.4	91.4	102.7	119.4	107.1	150.5	127.1
	HDR-4	94.9	97.3	96.1	103.2	93.4	98.5	115.6	104.7	129.2	123.9
	HDR-5	98.3	102.5	100.5	103.9	91.3	107.1	127.3	115.9	153.3	134.0
	HDR-6	96.0	98.3	96.4	104.7	105.0	106.2	120.2	112.5	159.6	129.5
	HDR-7	94.9	94.1	99.1	97.9	101.9	106.2	116.5	114.2	152.7	129.6
	HDR-8	101.7	89.6	91.7	105.2	101.4	98.9	120.9	106.3	162.5	127.0
	HDR-9	98.4	96.1	93.2	105.0	104.3	106.4	121.9	111.5	164.0	145.8
	HDR-10	100.7	96.8	95.7	103.4	102.3	104.6	119.7	130.4	152.8	139.1
	HDR-11	98.2	95.6	87.1	82.4	96.6	103.3	113.6	122.4	169.0	119.9
	LCS2	98.2	95.9	86.9	106.4	102.4	95.1	106.1	117.3	131.4	103.6
Quinoline	LCS1	100.2	100.8	105.7	114.8	103.5	93.5	94.3	103.1	101.1	100.2
	HDR-1	89.3	88.1	79.6	95.1	80.9	77.3	84.1	87.0	117.9	92.0
	HDR-2	99.8	80.2	83.6	84.9	79.6	62.0	89.8	95.5	105.1	82.9
	HDR-3	98.3	90.7	82.5	89.6	74.7	73.1	89.6	91.3	97.0	83.8
	HDR-4	90.4	77.4	66.9	81.2	76.1	69.7	83.5	86.2	106.5	78.8
	HDR-5	83.9	83.7	74.7	78.5	74.7	75.7	95.7	102.4	113.4	81.4

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-6	87.8	79.9	86.4	89.1	77.2	81.5	90.7	99.9	111.4	83.3
	HDR-7	92.1	84.9	88.7	90.0	83.0	78.5	84.7	94.5	103.8	87.7
	HDR-8	109.3	89.9	78.7	72.6	86.8	65.7	84.8	89.0	114.3	82.6
	HDR-9	89.7	73.0	85.6	91.5	81.3	62.9	83.1	98.5	104.7	77.4
	HDR-10	98.9	83.1	75.6	98.6	81.6	61.3	87.5	110.7	110.6	85.5
	HDR-11	108.5	84.2	76.5	81.5	77.3	70.1	91.7	90.2	113.6	90.7
	LCS2	104.7	95.4	102.5	95.9	99.3	98.9	96.5	100.6	95.8	97.0
Simazine	LCS1	93.4	99.5	99.8	104.8	98.7	99.8	97.7	97.8	101.4	95.9
	HDR-1	103.7	118.7	104.2	103.8	106.3	101.9	112.5	94.7	107.4	117.9
	HDR-2	108.5	124.9	106.1	106.1	100.8	106.4	114.2	100.1	105.1	118.6
	HDR-3	111.0	106.3	103.5	103.1	102.1	91.2	111.6	103.3	108.4	121.3
	HDR-4	106.9	120.1	108.8	105.2	87.3	90.8	107.6	102.6	103.2	113.8
	HDR-5	110.3	117.2	107.2	110.3	94.0	95.8	115.0	102.5	110.7	105.1
	HDR-6	100.1	114.7	105.8	103.1	104.8	93.4	109.7	95.1	106.6	112.3
	HDR-7	108.6	114.1	105.6	106.5	104.8	99.2	111.6	93.7	93.4	121.6
	HDR-8	107.9	111.2	110.6	99.0	87.4	95.3	102.5	97.1	108.4	111.6
	HDR-9	116.0	104.8	103.4	95.4	97.2	99.5	113.0	103.8	123.2	109.7
	HDR-10	102.4	121.9	103.4	109.4	96.9	98.4	104.4	104.2	109.8	119.3
	HDR-11	112.2	119.8	114.1	77.6	102.0	93.4	120.0	93.2	106.3	115.4
	LCS2	89.6	100.8	99.1	96.6	93.7	100.7	100.3	95.1	96.3	92.1
Sucralose - M-H	LCS1	95.1	102.3	105.7	103.9	96.4	98.1	97.2	108.1	102.1	104.0
	HDR-1	202.2	231.9	139.8	128.2	156.9	114.4	248.9	145.8	152.7	346.0
	HDR-2	194.7	196.7	163.7	179.4	176.7	203.6	253.6	298.1	181.6	248.1
	HDR-3	251.0	139.4	149.0	186.3	204.5	187.9	255.0	189.1	253.4	241.0
	HDR-4	185.1	147.3	136.7	170.5	147.5	172.6	262.4	132.2	146.2	204.6
	HDR-5	207.8	164.1	146.7	148.9	154.9	158.0	282.0	189.3	248.3	251.2
	HDR-6	203.3	141.2	148.3	142.2	201.1	154.0	250.0	132.4	187.2	195.7
	HDR-7	238.0	190.4	180.9	140.9	123.9	137.1	275.4	172.5	179.9	220.1
	HDR-8	214.7	147.5	126.1	138.3	162.7	124.9	234.9	150.5	111.5	228.6
	HDR-9	247.8	157.8	105.4	123.9	142.6	155.3	259.1	151.8	220.1	221.0
	HDR-10	199.6	146.2	136.6	148.2	153.7	102.8	261.7	169.8	132.8	215.3
	HDR-11	163.2	126.2	147.0	101.1	186.9	149.3	250.5	107.9	167.8	182.3
	LCS2	102.4	101.0	104.5	100.0	100.9	105.7	107.8	101.7	95.0	105.2
Sulfachloropyridazine	LCS1	92.1	95.4	95.3	111.3	103.6	92.9	101.3	95.8	103.7	115.2
	HDR-1	24.0	24.8	24.4	14.3	42.3	8.8	29.2	12.9	51.7	27.6
	HDR-2	21.5	25.7	23.1	27.2	37.0	18.7	19.4	10.6	48.0	31.7
	HDR-3	45.9	10.2	17.0	18.8	47.2	15.1	27.1	28.9	44.8	30.2
	HDR-4	21.3	23.0	28.4	19.6	41.2	25.9	35.1	23.6	56.7	27.0
	HDR-5	18.3	21.1	23.2	17.3	48.3	24.9	30.5	19.7	60.6	35.4
	HDR-6	13.4	32.9	37.8	23.6	65.7	32.3	28.7	15.1	46.0	21.9
	HDR-7	23.6	54.6	32.0	21.0	25.2	21.0	37.6	27.3	41.4	32.9
	HDR-8	36.9	19.5	31.5	16.3	43.8	35.2	43.7	29.7	43.3	32.2
	HDR-9	26.4	33.7	35.3	24.2	46.3	34.4	41.1	29.2	48.0	29.6
	HDR-10	22.0	31.0	29.7	16.1	55.2	13.9	42.7	24.3	60.9	23.5
	HDR-11	23.8	30.7	51.0	16.5	46.0	30.1	36.2	19.7	40.5	17.4
	LCS2	90.2	88.6	87.7	98.9	86.5	92.7	100.5	91.7	106.1	134.4

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
Sulfadiazine	LCS1	96.7	104.2	105.5	108.8	107.6	105.3	107.4	96.3	111.6	99.8
	HDR-1	91.1	81.8	102.0	67.4	49.7	104.1	88.8	112.4	117.8	81.2
	HDR-2	57.0	63.1	52.3	73.1	45.4	76.6	104.7	97.2	110.3	141.5
	HDR-3	97.4	178.4	91.9	72.5	74.2	111.5	145.8	133.7	143.1	101.3
	HDR-4	100.6	196.6	91.8	58.5	39.1	96.0	140.0	90.7	144.5	84.9
	HDR-5	101.2	188.1	109.6	139.8	89.2	68.0	170.1	130.6	149.3	95.6
	HDR-6	116.2	81.2	46.9	59.6	77.9	86.9	101.1	105.9	93.8	79.4
	HDR-7	126.0	141.3	91.2	73.8	5.5	65.9	227.7	99.7	124.0	78.3
	HDR-8	73.6	68.0	136.3	77.7	32.2	62.4	42.5	109.9	120.1	79.6
	HDR-9	120.0	70.5	82.5	45.9	69.9	60.4	108.7	118.7	140.6	65.3
	HDR-10	88.6	54.4	178.6	99.3	95.4	40.4	111.6	94.5	173.6	91.7
	HDR-11	86.0	82.7	119.3	N/A	78.2	174.3	154.7	98.5	137.0	46.9
	LCS2	92.6	98.0	97.7	98.8	102.5	103.7	115.5	99.9	110.4	97.5
Sulfadimethoxine	LCS1	100.5	96.0	100.9	105.0	95.8	100.6	92.2	96.5	133.8	92.1
	HDR-1	93.7	145.4	104.1	121.9	92.8	90.1	82.7	77.7	131.6	111.3
	HDR-2	102.9	124.2	110.2	124.1	91.1	86.9	94.8	73.5	99.6	112.2
	HDR-3	106.9	125.3	123.7	103.0	91.3	85.9	87.7	78.3	123.7	114.8
	HDR-4	91.6	144.9	138.0	127.7	92.7	85.2	87.5	75.2	97.6	112.5
	HDR-5	119.4	111.6	153.0	116.3	94.9	85.9	94.2	86.0	119.0	92.5
	HDR-6	125.2	136.3	138.9	121.3	100.3	91.2	97.6	70.6	126.9	95.4
	HDR-7	109.8	127.3	128.9	112.9	106.5	85.2	104.8	84.0	107.8	104.2
	HDR-8	116.9	109.7	125.4	109.1	97.8	83.6	88.7	79.0	121.6	109.9
	HDR-9	101.8	112.3	131.2	127.5	129.3	88.9	79.4	75.8	129.3	92.8
	HDR-10	107.6	119.0	110.6	107.9	105.4	85.4	99.5	85.8	128.8	134.2
	HDR-11	121.0	129.4	124.7	60.9	102.5	80.9	83.2	75.2	110.8	103.9
	LCS2	89.3	97.2	92.6	92.9	95.0	103.6	102.2	111.4	131.4	91.4
Sulfamerazine	LCS1	92.5	92.8	94.8	105.8	93.0	89.3	101.5	90.1	110.3	103.9
	HDR-1	138.0	86.1	61.8	107.5	108.0	54.0	41.1	58.8	138.9	55.2
	HDR-2	91.5	130.8	146.9	94.6	84.5	171.4	63.5	53.8	139.4	81.6
	HDR-3	65.8	158.3	107.4	95.5	113.7	96.1	91.3	57.5	84.8	167.9
	HDR-4	91.6	101.8	89.3	137.0	146.7	121.3	88.9	100.5	80.2	224.4
	HDR-5	118.4	101.6	77.6	200.3	92.3	148.6	51.5	118.7	80.6	45.5
	HDR-6	187.0	154.4	104.8	75.0	220.7	211.2	94.6	73.4	64.0	120.2
	HDR-7	99.2	35.0	117.0	179.4	82.1	128.6	119.0	92.2	51.0	107.5
	HDR-8	101.8	148.4	88.7	146.3	131.3	108.7	99.7	98.0	156.9	91.6
	HDR-9	122.5	129.1	102.5	83.5	139.4	66.4	107.2	70.8	136.9	89.1
	HDR-10	144.0	100.3	120.7	107.1	125.2	113.6	269.0	115.8	149.9	52.4
	HDR-11	115.2	98.2	53.1	74.6	81.7	65.2	121.2	155.5	63.3	111.7
	LCS2	108.0	111.7	102.5	114.4	105.1	86.7	115.9	96.3	113.5	126.2
Sulfamethazine	LCS1	102.1	95.2	101.7	111.7	88.5	95.2	98.5	109.6	130.3	113.6
	HDR-1	150.8	131.2	184.7	64.9	58.3	157.3	126.0	41.8	54.6	113.4
	HDR-2	97.1	156.4	91.2	78.4	148.5	103.6	136.1	94.6	17.9	188.0
	HDR-3	62.9	194.1	67.7	67.3	108.9	118.5	85.1	58.7	128.3	41.2
	HDR-4	132.1	90.9	37.6	123.1	143.4	143.5	123.4	107.1	106.0	176.0
	HDR-5	190.6	132.0	201.5	124.4	169.3	174.6	149.2	52.9	82.3	119.2
	HDR-6	100.8	99.8	205.0	62.1	47.7	120.5	129.4	55.9	47.8	125.0
	HDR-7	114.8	173.6	65.1	105.4	228.2	84.0	120.0	99.2	254.1	148.2
	HDR-8	147.0	96.1	174.0	154.7	231.4	154.0	57.6	87.3	85.7	123.1

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-9	117.0	125.8	124.9	103.6	144.1	182.5	139.1	168.2	70.2	135.5
	HDR-10	114.8	100.8	152.8	118.5	126.2	138.4	92.7	110.5	60.4	157.3
	HDR-11	139.4	69.5	103.5	60.6	118.7	70.4	138.9	124.3	74.8	142.8
	LCS2	98.1	90.8	95.0	105.2	98.6	94.7	107.9	106.3	126.6	111.6
Sulfamethizole	LCS1	98.5	92.3	99.5	108.4	82.7	91.6	92.0	94.1	94.2	106.5
	HDR-1	202.2	140.0	178.4	200.4	290.4	215.2	230.6	152.0	183.4	77.7
	HDR-2	266.4	254.9	242.2	174.9	215.1	304.5	238.6	123.8	108.8	193.0
	HDR-3	254.7	188.5	206.6	92.5	307.7	369.9	328.3	155.0	51.1	123.2
	HDR-4	268.7	174.4	184.4	160.7	267.9	273.0	303.3	278.1	276.3	93.0
	HDR-5	174.3	225.2	190.9	158.4	262.5	330.2	259.0	251.1	243.2	285.5
	HDR-6	306.7	202.2	274.9	183.1	324.4	335.5	326.6	264.4	267.5	281.9
	HDR-7	218.0	280.2	148.4	184.5	286.2	242.9	257.9	230.7	253.2	81.7
	HDR-8	209.1	171.9	187.9	224.6	268.5	252.9	185.8	332.3	104.7	169.5
	HDR-9	180.9	277.3	217.1	147.0	360.3	315.4	303.5	279.7	229.8	172.4
	HDR-10	219.3	199.6	240.2	174.9	264.9	275.4	217.2	142.3	205.4	333.5
	HDR-11	239.7	166.4	285.7	141.0	314.8	317.1	251.1	214.9	127.2	203.7
	LCS2	93.4	94.1	98.4	103.7	89.8	88.8	89.3	93.9	94.6	103.0
Sulfamethoxazole	LCS1	99.7	101.4	101.2	106.4	101.9	99.8	100.1	102.6	101.5	102.2
	HDR-1	97.9	97.1	69.9	105.7	92.3	66.5	102.8	85.8	90.3	90.0
	HDR-2	83.6	98.8	101.6	85.9	78.6	64.1	63.9	80.2	93.9	83.1
	HDR-3	86.1	91.4	84.6	106.7	81.6	59.5	87.0	74.9	88.1	90.4
	HDR-4	95.7	79.0	76.8	85.9	98.0	55.8	67.8	93.6	80.6	78.5
	HDR-5	80.7	76.5	98.3	92.6	117.3	64.9	67.2	81.1	90.4	83.7
	HDR-6	81.4	94.9	90.5	88.6	66.6	58.4	97.2	93.0	101.5	98.6
	HDR-7	112.5	112.3	94.3	97.8	82.2	79.7	82.4	81.7	93.7	113.3
	HDR-8	69.9	80.7	96.8	77.5	83.6	66.4	85.0	66.4	95.1	89.3
	HDR-9	91.9	76.2	89.3	93.2	78.3	66.1	86.5	98.6	91.6	86.6
	HDR-10	91.0	79.3	95.5	76.2	78.9	65.8	91.8	78.4	79.8	69.2
	HDR-11	86.1	107.3	80.4	60.2	102.6	68.6	77.3	93.1	87.5	98.2
	LCS2	100.5	98.9	104.1	102.2	98.1	98.0	98.9	96.5	96.6	100.2
Sulfathiazole	LCS1	95.8	93.9	93.7	101.6	89.5	91.5	99.2	95.1	131.8	100.5
	HDR-1	80.1	63.0	55.9	86.4	67.3	60.7	62.9	94.4	114.4	70.1
	HDR-2	82.2	60.7	56.9	69.8	75.6	68.5	81.7	100.6	97.6	104.6
	HDR-3	63.5	77.2	49.0	64.4	77.9	49.8	48.6	80.5	114.4	91.2
	HDR-4	60.6	82.3	56.9	66.3	75.1	36.4	32.2	99.2	71.7	95.2
	HDR-5	80.3	69.5	51.4	77.3	62.2	50.4	45.3	72.6	97.9	88.1
	HDR-6	58.6	71.8	67.2	87.1	79.7	37.1	60.6	88.9	101.0	87.1
	HDR-7	74.2	63.2	63.9	72.5	62.4	62.6	70.6	73.1	103.8	68.3
	HDR-8	65.0	62.6	64.7	69.9	80.9	61.9	46.0	87.2	109.8	60.2
	HDR-9	74.5	73.4	65.5	81.9	54.4	65.2	42.2	100.8	118.7	67.2
	HDR-10	58.1	59.9	74.1	71.1	54.1	55.4	78.5	57.5	104.2	62.9
	HDR-11	75.1	62.0	58.5	31.2	56.5	46.0	67.9	88.8	123.5	93.1
	LCS2	85.7	82.1	80.4	100.8	102.3	84.6	94.8	114.3	111.3	95.8
Sulfometuron methyl	LCS1	103.1	96.6	95.4	108.3	95.9	92.2	103.1	84.7	104.8	98.0
	HDR-1	55.6	51.8	44.2	45.6	53.9	47.7	63.3	59.2	84.8	90.2
	HDR-2	53.9	44.6	50.1	44.3	55.7	45.9	58.5	55.4	88.6	91.9
	HDR-3	58.8	42.4	51.0	41.7	57.9	41.8	51.7	62.0	82.0	82.8
	HDR-4	50.6	46.5	45.4	41.0	51.5	49.7	54.3	69.9	95.0	86.6

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-5	46.8	47.1	47.1	40.7	52.7	43.6	55.3	57.0	83.2	84.0
	HDR-6	52.8	51.4	55.9	41.8	58.5	50.6	56.1	57.3	82.8	81.6
	HDR-7	56.5	48.2	54.1	43.0	48.5	44.5	50.7	51.2	83.5	84.9
	HDR-8	54.3	44.2	46.6	43.5	48.7	43.6	60.4	49.8	74.3	86.5
	HDR-9	54.9	47.6	52.8	38.9	58.4	46.6	54.3	52.8	81.0	84.2
	HDR-10	58.6	42.8	52.8	48.8	57.1	43.9	60.2	87.3	77.3	84.6
	HDR-11	54.0	49.0	51.1	42.8	59.3	49.0	58.3	59.8	70.1	81.3
	LCS2	93.7	87.5	94.8	83.0	85.7	105.8	92.2	69.5	84.9	85.9
TCEP	LCS1	111.9	102.5	99.9	107.3	92.9	96.5	108.7	97.4	101.4	98.6
	HDR-1	57.2	72.0	70.6	72.1	47.9	49.6	70.1	74.1	86.1	100.2
	HDR-2	62.8	72.3	67.9	69.4	55.2	60.4	72.7	85.4	96.1	95.0
	HDR-3	57.0	68.9	68.8	60.6	50.0	37.6	68.4	80.2	66.4	110.3
	HDR-4	64.1	71.3	59.3	72.2	56.8	46.0	70.9	80.6	79.5	102.9
	HDR-5	77.0	72.5	72.7	73.3	59.6	48.2	76.7	84.2	100.4	93.4
	HDR-6	69.5	71.4	78.9	74.6	44.2	58.5	91.6	72.7	97.3	119.9
	HDR-7	65.7	78.7	67.1	67.2	49.7	47.2	63.6	83.5	87.3	104.9
	HDR-8	63.6	82.4	71.5	66.3	35.2	55.1	58.2	80.8	85.1	97.9
	HDR-9	58.1	65.0	62.7	62.5	41.4	39.1	67.2	90.2	94.3	95.4
	HDR-10	61.4	74.6	66.8	66.4	47.2	48.7	84.5	80.1	86.8	102.4
	HDR-11	83.5	63.5	69.9	58.0	41.1	49.4	1.4	81.9	82.3	117.7
	LCS2	103.7	95.8	89.6	107.7	75.0	100.7	94.0	88.2	101.4	85.2
TCPP	LCS1	108.8	99.3	103.7	117.0	124.0	117.0	119.3	84.6	165.3	82.2
	HDR-1	73.5	93.4	81.7	104.2	120.1	78.1	138.3	98.7	196.2	102.5
	HDR-2	90.2	94.7	96.3	103.1	153.8	97.0	121.9	104.4	137.9	119.0
	HDR-3	92.7	87.3	98.5	111.9	147.5	110.7	134.0	145.1	186.0	97.4
	HDR-4	80.1	93.2	106.3	114.6	168.9	95.3	144.6	88.0	168.7	106.6
	HDR-5	84.5	110.0	95.8	115.2	170.4	97.8	143.2	120.7	174.5	97.8
	HDR-6	93.5	100.6	86.8	100.5	125.8	112.8	152.4	137.2	215.5	109.1
	HDR-7	92.2	92.7	98.6	117.7	119.7	122.2	146.6	121.0	194.3	92.8
	HDR-8	99.5	95.6	93.0	118.0	100.6	87.4	134.7	108.9	249.7	92.8
	HDR-9	87.7	103.9	100.7	105.9	123.1	112.0	132.1	147.5	224.1	99.0
	HDR-10	86.9	102.2	86.9	109.2	135.8	102.6	170.1	824.4	206.9	105.8
	HDR-11	91.0	83.6	102.2	68.5	121.4	86.7	161.7	149.1	266.7	97.4
	LCS2	119.8	98.0	84.2	111.3	77.2	120.0	117.3	85.7	203.8	69.8
TDCPP - PRM	LCS1	124.3	99.8	101.7	111.7	113.6	101.5	137.6	101.1	138.4	80.5
	HDR-1	65.5	56.9	58.4	68.0	49.4	47.8	53.3	65.9	73.2	59.9
	HDR-2	77.8	73.1	75.9	51.8	47.5	41.3	46.1	70.7	60.7	52.3
	HDR-3	70.3	55.6	60.4	49.8	51.4	44.0	47.6	73.1	76.9	47.3
	HDR-4	63.2	52.3	61.6	50.8	54.4	38.7	44.7	57.2	55.2	35.9
	HDR-5	80.3	58.0	61.2	49.4	55.1	51.0	42.1	73.2	61.6	46.8
	HDR-6	86.5	54.2	67.5	53.7	54.4	49.6	41.6	74.7	67.3	48.9
	HDR-7	71.9	52.4	54.3	52.1	48.0	38.0	45.2	57.3	75.4	51.4
	HDR-8	75.0	54.5	70.1	48.1	47.4	41.0	36.0	68.7	72.8	38.1
	HDR-9	99.4	50.8	67.5	46.5	53.8	41.0	41.2	70.0	74.1	49.1
	HDR-10	91.3	48.0	73.2	51.2	71.5	51.0	40.8	95.3	78.8	49.0
	HDR-11	76.0	53.1	64.2	108.1	54.3	36.3	45.3	68.3	75.3	41.0
	LCS2	101.2	77.2	74.3	78.4	131.3	81.6	76.8	110.3	83.1	44.3
Testosterone	LCS1	101.1	106.3	104.5	118.1	94.8	99.0	98.2	101.4	92.2	82.7

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-1	101.3	114.2	92.2	106.1	84.3	92.8	89.2	98.0	95.5	79.5
	HDR-2	106.2	108.4	113.7	105.2	83.1	85.3	93.5	115.4	97.7	83.5
	HDR-3	112.6	113.5	110.0	118.0	76.8	78.2	92.0	108.3	100.6	80.1
	HDR-4	98.5	95.2	94.5	101.1	74.8	86.9	88.4	111.3	93.0	78.2
	HDR-5	91.2	99.5	100.7	101.8	86.4	80.4	85.4	146.2	108.4	83.8
	HDR-6	101.2	104.2	115.9	107.1	88.3	84.3	92.0	102.2	95.7	85.7
	HDR-7	115.9	120.5	103.5	111.8	83.1	73.1	82.4	98.7	98.1	83.1
	HDR-8	101.5	111.5	104.0	115.4	68.2	76.0	80.4	95.1	89.1	74.1
	HDR-9	93.4	102.6	101.3	99.1	84.2	80.8	81.2	109.3	104.8	81.3
	HDR-10	99.6	97.5	104.5	109.0	83.2	82.4	87.4	143.0	108.0	83.3
	HDR-11	111.8	93.8	95.2	97.1	79.7	83.3	97.8	96.2	103.4	82.4
	LCS2	100.4	103.6	110.8	112.8	82.4	96.9	95.4	93.4	98.7	85.5
Theobromine	LCS1	66.2	102.6	106.5	111.4	114.8	82.8	101.3	99.1	101.0	111.2
	HDR-1	77.6	94.7	37.5	62.6	74.9	88.5	86.3	24.9	104.0	131.2
	HDR-2	57.3	67.0	44.0	90.9	90.7	86.1	51.1	134.8	132.6	119.7
	HDR-3	74.5	59.0	68.7	125.5	66.1	61.9	40.6	72.7	105.0	132.3
	HDR-4	57.3	83.6	82.3	72.2	99.4	94.4	53.8	94.8	112.2	140.4
	HDR-5	58.7	57.7	94.7	80.0	90.5	85.7	109.0	46.0	114.2	120.9
	HDR-6	38.3	64.8	98.3	86.2	88.8	61.9	61.4	74.6	116.7	91.1
	HDR-7	52.8	73.4	70.7	75.1	72.4	76.3	159.2	87.3	109.6	115.7
	HDR-8	60.9	88.0	67.3	89.9	66.9	99.0	98.2	89.4	106.4	119.1
	HDR-9	59.1	73.1	64.0	66.3	75.4	78.6	77.2	84.5	105.5	113.9
	HDR-10	66.6	70.6	70.2	73.7	83.9	70.6	86.9	598.8	116.0	127.3
	HDR-11	58.6	48.4	76.6	60.3	62.4	93.1	54.6	77.0	100.0	114.3
	LCS2	67.1	92.7	108.1	107.3	98.9	113.1	81.8	93.0	96.6	90.8
Theophyline	LCS1	77.7	91.3	101.8	106.1	114.3	105.6	83.2	99.0	94.4	110.2
	HDR-1	54.2	51.8	69.1	33.5	72.2	162.3	378.4	357.5	132.4	182.2
	HDR-2	50.6	79.2	73.0	55.9	79.8	245.5	268.3	360.4	136.3	166.1
	HDR-3	36.9	58.1	58.4	25.9	106.6	177.3	323.9	226.0	159.5	175.8
	HDR-4	47.0	47.9	74.4	30.1	75.0	167.4	181.7	255.6	130.7	174.4
	HDR-5	22.8	47.7	78.1	39.3	113.0	218.0	197.1	288.8	135.4	161.1
	HDR-6	28.7	51.1	53.2	40.8	84.2	198.1	271.0	140.4	129.9	128.9
	HDR-7	43.7	56.4	83.1	45.6	63.8	197.4	307.3	193.7	140.8	167.1
	HDR-8	44.7	36.4	58.2	59.6	79.2	210.6	161.8	149.0	108.8	178.7
	HDR-9	34.0	54.1	54.4	33.3	91.0	176.5	190.2	229.2	117.4	165.8
	HDR-10	54.6	33.0	80.9	27.4	105.8	104.9	140.8	486.9	122.8	148.4
	HDR-11	32.9	31.7	87.7	31.5	53.7	180.8	177.4	205.2	147.4	174.1
	LCS2	70.1	96.2	90.0	88.1	108.3	92.5	67.7	93.7	90.3	100.7
Thiabendazole	LCS1	100.7	97.5	96.3	108.5	90.0	95.4	100.0	89.5	97.5	104.3
	HDR-1	84.3	98.5	95.1	90.9	108.9	37.8	103.7	73.5	101.4	99.9
	HDR-2	93.7	101.8	99.9	97.9	97.9	33.3	102.7	79.3	99.4	101.4
	HDR-3	87.9	91.3	97.9	96.3	91.9	30.9	106.8	77.9	105.3	93.3
	HDR-4	84.6	75.7	86.1	104.7	102.8	32.9	99.3	82.6	106.8	83.7
	HDR-5	84.1	89.7	102.0	93.5	99.1	37.4	99.3	101.9	109.9	87.8
	HDR-6	76.8	91.4	99.3	101.4	98.6	33.3	98.1	84.8	99.7	98.6
	HDR-7	92.6	101.3	102.4	112.6	89.8	34.2	104.5	80.3	105.2	101.6
	HDR-8	84.9	86.8	100.3	102.9	93.9	36.0	89.5	78.4	96.8	95.6
	HDR-9	82.1	93.5	102.8	94.7	100.7	37.8	95.0	82.6	105.3	92.8

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-10	69.8	86.2	98.5	104.4	101.1	36.8	99.7	84.5	103.4	98.4
	HDR-11	101.1	96.7	90.5	82.8	93.1	35.2	108.6	77.7	96.8	103.6
	LCS2	105.7	102.2	105.0	112.3	109.8	98.4	96.5	95.3	95.4	107.0
Triclocarban	LCS1	128.5	97.0	101.8	105.6	74.9	99.8	103.2	89.2	129.2	98.4
	HDR-1	117.1	101.1	96.4	115.0	73.2	64.8	93.8	59.8	97.0	64.6
	HDR-2	130.0	102.0	96.3	110.6	66.3	52.7	90.8	55.1	70.8	61.7
	HDR-3	117.4	101.9	100.5	112.8	61.4	61.7	74.7	55.5	79.7	63.0
	HDR-4	133.0	109.5	102.0	113.0	68.2	59.4	66.0	48.3	75.5	51.6
	HDR-5	121.5	115.8	100.2	110.3	67.3	63.6	78.5	62.7	81.6	56.3
	HDR-6	145.4	110.8	110.0	117.4	70.8	55.4	87.9	58.5	98.6	53.5
	HDR-7	131.6	110.1	109.8	111.5	66.8	63.1	71.3	59.3	85.6	52.4
	HDR-8	131.4	110.1	97.4	115.5	59.5	59.3	78.1	54.0	83.7	49.7
	HDR-9	132.1	116.7	113.6	114.5	69.9	63.1	86.5	58.4	113.9	53.0
	HDR-10	132.5	106.2	101.7	101.5	72.8	54.2	94.3	68.5	102.9	64.2
	HDR-11	141.0	115.4	108.0	119.6	59.4	54.4	83.0	58.3	95.5	56.0
	LCS2	125.2	102.1	101.2	112.2	92.8	95.4	121.7	99.4	123.3	88.9
Triclosan	LCS1	73.4	77.1	82.8	91.6	80.4	83.3	73.2	85.0	124.5	91.6
	HDR-1	112.1	122.7	106.6	152.5	98.0	104.0	134.4	100.8	150.0	102.6
	HDR-2	111.5	126.6	113.2	154.6	89.0	94.9	136.1	100.3	115.9	105.0
	HDR-3	106.8	120.8	114.1	154.0	83.3	103.4	126.8	100.5	134.0	104.8
	HDR-4	112.4	120.4	114.6	155.2	85.2	95.6	121.5	91.8	117.6	91.6
	HDR-5	109.6	129.0	116.8	151.7	88.3	115.1	131.8	103.6	136.2	100.7
	HDR-6	116.0	117.0	111.2	153.4	96.0	101.9	133.9	104.6	151.2	98.6
	HDR-7	113.7	120.7	113.7	146.6	93.0	115.4	115.5	101.1	137.7	97.6
	HDR-8	112.7	115.8	113.6	157.0	85.4	103.2	128.2	95.1	130.6	92.0
	HDR-9	117.2	118.7	109.3	147.1	94.3	109.6	136.7	97.6	156.5	98.2
	HDR-10	112.7	119.6	107.1	150.3	93.4	108.9	134.0	111.3	152.8	110.6
	HDR-11	119.5	119.6	105.5	142.8	88.7	101.0	136.0	96.4	146.1	102.0
	LCS2	60.8	60.7	60.3	79.0	76.3	62.4	75.8	96.8	110.8	85.6
Trimethoprim	LCS1	96.4	87.5	95.8	108.8	105.2	101.9	104.1	100.7	103.6	96.2
	HDR-1	89.4	83.8	98.8	111.2	87.5	66.3	96.6	94.4	88.8	95.0
	HDR-2	88.0	86.0	95.8	92.6	87.1	67.8	76.5	91.6	96.5	86.8
	HDR-3	91.3	86.0	91.4	90.7	78.5	67.3	91.9	96.6	88.8	94.6
	HDR-4	97.7	88.2	86.7	83.1	77.9	69.9	92.8	88.1	109.1	91.8
	HDR-5	89.8	78.0	102.1	83.7	73.2	76.8	85.6	105.8	94.0	96.4
	HDR-6	100.2	95.1	80.0	82.8	93.1	72.4	86.5	98.1	95.8	91.2
	HDR-7	90.7	83.7	98.6	73.7	97.0	65.4	104.9	98.7	94.4	88.9
	HDR-8	91.1	84.0	73.0	92.9	84.1	62.1	91.7	98.5	92.1	96.0
	HDR-9	82.4	82.2	90.4	88.0	80.3	76.2	80.1	89.4	99.1	94.8
	HDR-10	86.1	90.6	94.9	82.0	85.9	70.3	74.4	85.1	79.1	96.3
	HDR-11	91.8	81.2	92.2	83.8	80.8	69.3	94.5	91.5	96.6	93.3
	LCS2	103.5	91.1	94.8	90.0	102.3	103.6	100.4	94.4	94.7	96.2
Warfarin	LCS1	89.8	93.1	92.4	99.9	67.2	84.8	92.1	96.3	115.5	90.4
	HDR-1	126.2	128.4	141.1	141.1	130.8	128.6	200.5	148.0	236.3	185.6
	HDR-2	118.5	123.6	130.5	144.8	117.9	117.4	189.1	149.8	158.0	171.6
	HDR-3	127.5	121.3	126.8	137.9	116.5	121.7	182.5	148.5	191.4	153.7
	HDR-4	121.7	131.4	121.8	137.3	111.3	107.3	159.5	137.5	167.3	140.8
	HDR-5	124.6	126.3	133.4	135.0	112.1	113.7	170.8	138.4	184.2	144.0

Working Stock Standard ID		WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 06-30-16	WSS 07-15-16	WSS-07-25-16	WSS 08-15-16	WSS 08-29-16	WSS 09-07-16	WSS-09-21-16
Analytical Date		7/1/16	7/3/16	7/5/16	7/8/16	7/17/16	7/31/16	8/15/16	8/30/16	9/7/16	9/21/16
Days Since Spike		0	2	4	7	16	30	45	60	69	84
Compound	**Sample Name**										
	HDR-6	128.6	130.9	121.0	135.6	113.2	122.6	173.7	144.5	204.8	144.4
	HDR-7	123.3	136.6	129.9	135.4	116.6	117.3	163.1	141.9	180.5	151.8
	HDR-8	128.0	119.9	124.0	139.0	111.8	116.8	153.8	139.6	183.5	145.7
	HDR-9	120.1	123.6	124.3	134.7	117.8	122.9	165.0	142.9	208.6	150.6
	HDR-10	124.0	123.2	124.9	126.5	116.3	118.7	155.5	163.3	207.1	170.7
	HDR-11	130.4	127.6	117.2	125.0	109.9	118.3	168.8	146.6	208.8	139.7
	LCS2	80.9	80.1	77.7	92.2	61.4	73.2	99.0	105.3	99.4	89.9

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Appendix E
Tabular Summary of Groundwater Monitoring Results

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Table E-1. Groundwater quality analytical results from Hawks Prairie Study Area residential wells and Thurston County Landfill monitoring well MW-15.

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	Thurston Cty Public Works
																		6/3/2015
General Water Quality Parameters																		
Bicarbonate Alkalinity (as HCO_3)	mg/L	2	N/A	N/A	77	150	97	70	92	54	100	120	160	77	100	180	78	58
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	64	120	80	58	75	44	83	100	130	63	85	150	64	48
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	umho/cm	2	N/A	N/A	170	270	240	130	220	140	200	200	270	180	200	1400	150	130
Total Dissolved Solids (TDS)	mg/L	10	500	500	130	180	160	100	150	110	130	130	180	140	140	770	110	90
Total Organic Carbon	mg/L	0.3	N/A	N/A	ND	ND	ND	0.3	0.49	0.33	0.34	0.67	0.5	0.68	4	1.2	0.3	0.3
Bromide	µg/L	5	N/A	N/A	11	43	49	8	29	14	13	15	16	16	25	870	10	12
Chloride	mg/L	1	250	250	3.6	4.3	13	2.2	4.4	3.5	5.2	2.4	2.6	4.8	5.2	320	2.6	2.2
Sulfate	mg/L	0.5	250	250	6.6	10	6.9	5.2	4.7	12	7.4	ND	9.9	9.8	3	44	8.1	11
Sulfide	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	47	120	99	54	88	52	84	71	130	75	85	240	58	48
Metals (Dissolved)*																		
Aluminum	µg/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	µg/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	µg/L	1	10	0.05	ND	1.3	ND	ND	ND	2.5	ND	28	3.8	ND	2.3	1.1	2.6	3.6
Barium	µg/L	2	2000	1000	2.2	9.3	4.8	4.6	4.2	4.1	3.9	8	14	6	8	17	7.5	4.7
Beryllium	µg/L	1	4	N/A	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.094	ND	ND
Cadmium	µg/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	N/A	N/A	10	20	20	11	17	7.1	17	18	20	16	19	24	8.7	9.2
Chromium	µg/L	1	100	50	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	µg/L	2	1300	1000	ND	2.8	9.7	7.7	17	ND	3.1	ND	ND	5.3	2.7	5.2	5	ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	0.082	ND	0.037	0.025	ND	0.046	1.6	ND	10	0.095	0.26	0.12
Lead	µg/L	0.5	15	50	ND	ND	ND	0.7	0.96	ND	ND	ND	ND	ND	ND	ND	1.2	ND
Magnesium	mg/L	0.1	N/A	N/A	5.4	16	12	6.5	11	8.4	10	6.4	20	8.6	9.1	45	8.9	6.1
Manganese	µg/L	2	50	50	ND	4	ND	ND	6.6	7.8	2.1	100	230	83	580	67	250	87
Mercury	µg/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	µg/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/L	1	N/A	N/A	2.1	2.4	1.6	1.1	1.5	1.9	1.6	4.7	2.7	1.6	1.8	12	2.3	1.9
Selenium	µg/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND
Silica	mg/L	0.428	N/A	N/A	31	35	37	38	43	28	36	45	47	36	50	67	45	34
Silver	µg/L	0.5	100	N/A	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND
Sodium	mg/L	1	N/A	N/A	100	8.5	8.7	6.1	9.1	5	7.7	14	8.3	6.7	8.4	180	6	4.9

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
Thallium	µg/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Zinc	µg/L	20	5000	5000	130	30	ND	110	36	ND	ND	ND	ND	ND	ND	69	ND	ND	
Nutrients																			
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	1.7	1.1	2.7	0.23	5.2	0.37	1.3	ND	ND	2.4	0.26	1.8	ND	ND	
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	7.4	4.9	12	1	23	1.6	6	ND	ND	10	1.2	7.9	ND	ND	
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	1.7	1.1	2.7	0.23	5.2	0.37	1.3	ND	ND	2.3	0.26	1.8	ND	ND	
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.057	ND	ND	ND	ND	
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	0.16	ND	ND	ND	ND	ND	0.25	ND	ND	0.17	ND	ND	0.35	
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	0.25	ND	ND	0.45	ND	ND	0.34	
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.05	0.071	0.078	0.08	0.11	0.072	0.064	0.64	0.047	0.095	0.2 J-	0.1	0.092	0.12	
Orthophosphate (as P)	mg/L	0.01	N/A	N/A	ND	0.021	0.02	0.025	0.022	0.026	0.029	0.52	0.07	0.013	0.14	0.083	0.045	0.045	
Residual Chemicals																			
1,7-Dimethylxanthine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND R	ND	ND	ND	ND	ND	
2,4-D	ng/L	5	70	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4-nonylphenol	ng/L	100	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	
4-tert-octylphenol	ng/L	50	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Acesulfame-K	ng/L	20	N/A	N/A	ND	ND	ND	ND	210	ND	ND	ND	ND	ND	51	86	ND	ND	
Acetaminophen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	
Albuterol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Amoxicillin (semi-quantitative)	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	
Andorostenedione	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Atenolol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	
Atrazine	ng/L	5	3000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Azithromycin	ng/L	20	N/A	N/A	--	NA	ND UJ	NA	ND UJ	ND UJ	NA	NA	NA	ND UJ	ND UJ	NA	NA	ND UJ	
Bendroflumethiazide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bezafibrate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	
BPA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	10	ND	ND	
Bromacil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Butalbital	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Butylparben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Caffeine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	
Carbadox	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	
Carbamazepine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Carisoprodol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloramphenicol	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	
Chloridazon	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	
Chlorotoluron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Cimetidine	ng/L	5	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	
Clofibric Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
																		MW-15	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	Thurston Cty Public Works	
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
Cotinine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Cyanazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	13	15	ND	ND	
DACT	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
DEA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
DEET	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dehydronifedipine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
DIA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Diazepam	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Diclofenac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dilantin	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	
Diltiazem	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Diuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Erythromycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Estradiol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Estrone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ethinyl Estradiol - 17 alpha	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ethylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Flumeqine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Fluoxetine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Gemfibrozil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ibuprofen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Iohexal	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Iopromide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Isobutylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Isoproturon	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ketoprofen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ketorolac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Lidocaine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND UJ	ND	ND	ND	ND	ND	
Lincomycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Linuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Lopressor	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	
Meclofenamic Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Meprobamate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Metazachlor	ng/L	5	N/A	N/A	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	
Metformin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Methylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Metolachlor	ng/L	5	N/A	N/A	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND R	NA	NA	NA	
Naproxen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Nifedipine	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	
Norethisterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
OUST (Sulfameturon,methyl)	ng/L	5	N/A	N/A	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxolinic acid	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentoxifylline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenazone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Primidone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Progesterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.7	ND	ND	ND
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	ND	ND
Quinoline	ng/L	5	N/A	N/A	ND	ND	ND	ND	9.5	ND	ND	ND	ND	11	ND	ND	ND	ND	ND
Simazine	ng/L	5	4000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sucralose	ng/L	100	N/A	N/A	ND	ND	110	ND	130	ND	ND	ND	ND	ND	ND	100	ND	ND	ND
Sulfachloropyridazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfadiazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND R	ND	ND	ND R	ND	ND	ND	ND	ND	ND
Sulfadimethoxine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamerazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND
Sulfamethazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethizole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethoxazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfathiazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND
TCEP	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TDCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Testosterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theobromine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theophylline	ng/L	20	N/A	N/A	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thiabendazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND
Triclocarban	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Triclosan	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trimethoprim	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Warfarin	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PFCs																			
Perfluoro butanoic acid-PFBA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro octanesulfonic acid - PFOS	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND	ND	ND
Perfluoro octanesulfonate-PFOS	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND	ND	ND
Perfluoro octanoic acid - PFOA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-1-butanesulfonate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	ND

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
Perfluoro-1-butanesulfonic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	
Perfluoro-1-hexanesulfonate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Perfluoro-1-hexanesulfonic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Perfluoro-n-decanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Perfluoro-n-heptanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Perfluoro-n-hexanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Perfluoro-n-nonanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Perfluoropentanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
DBPs																			
Chloroform (Trichloromethane)	µg/L	0.5	N/A	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromoform	µg/L	0.5	N/A	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromodichloromethane	µg/L	0.5	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chlorodibromomethane	µg/L	0.5	N/A	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total THM	µg/L	0.5	80	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bacteria																			
E. Coli Bacteria (P/A)	P/A	NA	N/A	N/A	--	A UJ	A UJ	NA	A UJ	A UJ	A UJ	A UJ	NA	A UJ	A	NA	A UJ	A UJ	
E. Coli Bacteria	MPN / 100 mL	1.1	N/A	N/A	--	<1.1 J	<1.1 J	NA	<1.1 J	<1.1 J	<1.1 J	<1.1 J	NA	<1.1 J	<1	NA	<1.1 J	<1.1 J	
Total Coliform Bacteria (P/A)	P/A	NA	N/A	N/A	--	A UJ	A UJ	NA	P J	A UJ	A UJ	A UJ	NA	A UJ	A	NA	A UJ	A UJ	
Total Coliform Bacteria	MPN / 100 mL	1.1	N/A	N/A	<1	<1.1 J	<1.1 J	<1	>23 J	<1.1 J	<1.1 J	<1.1 J	140	<1.1 J	<1	<1	<1.1 J	<1.1 J	
Other Organics																			
PCB 1016 Aroclor	µg/L	0.08	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
PCB 1221 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
PCB 1232 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
PCB 1242 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
PCB 1248 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
PCB 1254 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
PCB 1260 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total PCBs	µg/L	0.1	0.5	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Pesticides and Herbicides																			
Alachlor (Alanex)	µg/L	0.1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Aldrin	µg/L	0.01	N/A	0.005	ND UJ	ND UJ	ND UJ	ND UJ	ND	ND	ND UJ	ND UJ	ND UJ	ND	ND UJ	ND UJ	ND UJ	ND	

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
Chlordane	µg/L	0.1	2	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	µg/L	0.01	N/A	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	µg/L	0.01	2	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	µg/L	0.01	0.4	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	µg/L	0.01	0.2	0.009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lindane (gamma-BHC)	µg/L	0.01	0.2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	µg/L	0.05	40	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	µg/L	0.5	3	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-T	µg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-TP (Silvex)	µg/L	0.2	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-D	µg/L	0.1	70	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DB	µg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,5-Dichlorobenzoic acid	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acifluorfen	µg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bentazon	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dalapon	µg/L	1	200	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dicamba	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorprop	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dinoseb	µg/L	0.2	7	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	µg/L	0.04	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Picloram	µg/L	0.1	500	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tot DCPA Mono&Diacid Degradate	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VOCs																			
1,1,1,2-Tetrachloroethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	µg/L	0.5	200	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	µg/L	0.5	5	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	µg/L	0.5	N/A	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	µg/L	0.5	7	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	µg/L	0.5	70	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	µg/L	0.5	5	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	µg/L	0.5	5	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	µg/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
2-Hexanone	µg/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone (MIBK)	µg/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	µg/L	0.5	5	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane (Methyl Bromide)	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	µg/L	0.5	5	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	µg/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane(Methyl Chloride)	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	µg/L	0.5	70	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	µg/L	0.5	5	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-isopropyl ether	µg/L	3	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	µg/L	0.5	700	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (1,3-DCB)	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Chlorotoluene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (1,2-DCB)	µg/L	0.5	600	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Chlorotoluene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (1,4-DCB)	µg/L	0.5	75	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	µg/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Units	MRL	Drinking Water Standard[1]	Ground-water Quality Standard[2]	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
tert-amyl Methyl Ether	µg/L	3	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
tert-Butyl Ethyl Ether	µg/L	3	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
tert-Butylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Tetrachloroethylene (PCE)	µg/L	0.5	5	0.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Toluene	µg/L	0.5	1000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total 1,3-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total xylenes	µg/L	0.5	10000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethylene	µg/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
trans-1,3-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Trichloroethylene (TCE)	µg/L	0.5	5	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Trichlorofluoromethane	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Trichlorotrifluoroethane (Freon 113)	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Vinyl chloride (VC)	µg/L	0.3	2	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
SVOCs																			
2,4-Dinitrotoluene	µg/L	0.1	N/A	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2,6-Dinitrotoluene	µg/L	0.1	N/A	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4,4-DDD	µg/L	0.1	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4,4-DDE	µg/L	0.1	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4,4-DDT	µg/L	0.1	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Acenaphthene	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Acenaphthylene	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	
Acetochlor	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Alachlor	µg/L	0.05	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Aldrin	µg/L	0.01	N/A	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Alpha-BHC	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
alpha-Chlordane	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Anthracene	µg/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	
Atrazine	µg/L	0.05	3	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Benz(a)Anthracene	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Benzo(a)pyrene	µg/L	0.02	0.2	0.008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Benzo(b)Fluoranthene	µg/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Benzo(g,h,i)Perylene	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Benzo(k)Fluoranthene	µg/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Beta-BHC	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromacil	µg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Butachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Butylbenzylphthalate	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chlorobenzilate	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroneb	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chlorothalonil(Draconil,Bravo)	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

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					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
Chlorpyrifos (Dursban)	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chrysene	µg/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Delta-BHC	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Di-(2-Ethylhexyl)adipate	µg/L	0.6	400	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Di(2-Ethylhexyl)phthalate	µg/L	0.6	6	N/A	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1	ND	
Diazinon (Qualitative)	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dibenz(a,h)Anthracene	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dichlorvos (DDVP)	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dieldrin	µg/L	0.01	N/A	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Diethylphthalate	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dimethoate	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	
Dimethylphthalate	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Di-n-Butylphthalate	µg/L	1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Di-N-octylphthalate	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endosulfan I (Alpha)	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endosulfan II (Beta)	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endosulfan Sulfate	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endrin	µg/L	0.01	2	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endrin Aldehyde	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
EPTC	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Fluoranthene	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Fluorene	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
gamma-Chlordane	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Heptachlor	µg/L	0.01	0.4	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Heptachlor Epoxide (isomer B)	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexachlorobenzene	µg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexachlorocyclopentadiene	µg/L	0.05	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Indeno(1,2,3,c,d)Pyrene	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Isophorone	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Lindane	µg/L	0.04	0.2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Malathion	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Methoxychlor	µg/L	0.05	40	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Metolachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Metribuzin	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	
Molinate	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Naphthalene	µg/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Parathion	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Pendimethalin	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Pentachlorophenol	µg/L	0.04	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Analyte	Units	MRL	Drinking Water Standard(1)	Ground-water Quality Standard(2)	Shallow Aquifer Residential Wells													Monitoring Wells	
					RES12	RES70	RES179	RES226	DOM667	RES782	RES937	RES962	RES963	DOM972	RES983	RES1082	RES1160	MW-15	Thurston Cty Public Works
					4/24/2015	5/1/2015	5/12/2015	4/24/2015	6/2/2015	6/5/2015	4/27/2015	4/29/2015	4/23/2015	6/4/2015	5/3/2016	4/23/2015	5/1/2015	6/3/2015	
Permethrin (mixed isomers)	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	µg/L	0.04	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Simazine	µg/L	0.05	4	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Terbacil	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Terbuthylazine	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiobencarb	µg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAH	µg/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-Nonachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trifluralin	µg/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl; PBDE = Polybrominated Diphenyl Ether; VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound; P = present; A = absent

Notes:

(1) Drinking Water Standards established by the Washington State Department of Health in 246-290 WAC. Includes Federal MCL Drinking Water Standards.

(2) Groundwater Quality Standard: Established by the Washington State Department of Ecology in WAC 173-200-040.

J = Value is detected and the result is estimated

J- = Value is detected and the result is estimated and biased low

UJ = Result is a non-detect and the value is estimated

R = Result rejected

*Drinking water and groundwater quality standards are for total metals.

Table E-2. Groundwater quality analytical results from Hawks Prairie Study Area municipal wells and Salmon Lane Spring.

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN 210	MUN 882	MUN 237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
								Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water #1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
General Water Quality Parameters																					
Bicarbonate Alkalinity (as HCO_3)	mg/L	2	N/A	N/A	77	150	97	63	90	99	65	85	110	160	180	160	46	79	100	52	52
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	64	120	80	51	74	81	54	70	93	130	150	140	38	65	83	43	43
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	umho/cm	2	N/A	N/A	170	270	240	130	190	220	140	230	250	300	370	330	86	180	200	120	120
Total Dissolved Solids (TDS)	mg/L	10	500	500	130	180	160	110	100	130	99	160	150	180	230	190	83	120	130	110	100
Total Organic Carbon	mg/L	0.3	N/A	N/A	ND	ND	ND	0.36	0.3	ND	ND	0.34	ND	0.39	0.31	0.54	0.41	ND	0.32	1.7	1.5
Bromide	µg/L	5	N/A	N/A	11	43	49	5.9	25	20	16	19	21	50	88	38	5.1	18	19	5.8	5.8
Chloride	mg/L	1	250	250	3.6	4.3	13	2.1	3.8	4.4	3.6	8.4	6.7	4.5	12	14	1.4	4.8	4.2	3.3	3.3
Sulfate	mg/L	0.5	250	250	6.6	10	6.9	6.4	7.8	7.8	5.7	9.9	10	11	11	11	2.2	7.4	12	7.1	7.1
Sulfide	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	47	120	99	46	76	88	52	89	110	120	160	140	29	73	83	47	44
Metals (Dissolved)*																					
Aluminum	µg/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	µg/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	µg/L	1	10	0.05	ND	1.3	ND	3.4	ND	ND	ND	ND	ND	1.3	1.2	1.1	ND	ND	2.4	ND	ND
Barium	µg/L	2	2000	1000	2.2	9.3	4.8	4.3	3.4	3.9	3.5	4.2	4.9	12	5.3	9.6	4.4	2.9	12	3.2	3.1
Beryllium	µg/L	1	4	N/A	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	µg/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	N/A	N/A	10	20	20	7.8	14	17	10	20	22	24	32	23	5.5	16	12	11	10
Chromium	µg/L	1	100	50	ND	ND	ND	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	µg/L	2	1300	1000	ND	2.8	9.7	ND	ND	ND	ND	ND	ND	3.7	3.4	4.7	ND	11	ND	ND	ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	0.082	ND	ND	ND	ND	ND	ND	0.054	ND	ND	0.34	ND	0.49	0.025	0.041
Lead	µg/L	0.5	15	50	ND	ND	ND	ND	ND	ND	ND	0.52	ND	ND	ND	0.72	ND	1.8	ND	ND	ND
Magnesium	mg/L	0.1	N/A	N/A	5.4	16	12	6.5	9.9	11	6.5	9.5	13	15	19	20	3.8	8	13	4.8	4.6
Manganese	µg/L	2	50	50	ND	4	ND	4.8	ND	ND	ND	ND	4.8	130	98	ND	84	ND	500	2.7	2.8
Mercury	µg/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.24	ND	ND
Nickel	µg/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9	ND	ND	6.1	ND	ND
Potassium	mg/L	1	N/A	N/A	2.1	2.4	1.6	2	1.9	2	1.4	1.8	2	2.5	3.2	3.4	1.3	1.7	3.7	ND	ND
Selenium	µg/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.428	N/A	N/A	31	35	37	37	36	38	29	25	34	34	40	37	56	39	47	29	27
Silver	µg/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	100	8.5	8.7	5.8	7.2	7.8	5.1	8.3	8	7.4	10	11	5.6	6.6	7.1	5.5	5.3
Thallium	µg/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	µg/L	20	5000	5000	130	30	ND	ND	ND	ND	100	ND	ND	ND	140	20	ND	68	ND	ND	ND
Nutrients																					
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	1.7	1.1	2.7	0.25	1.5	2.9	0.44	5.4	2.4	0.45	2.1	0.37	ND	2.9	ND	1.1	1.1
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	7.4	4.9	12	1.1	6.8	13	2	24	11	2	9.1	1.6	ND	13	ND	5	5
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	1.7	1.1	2.7	0.25	1.5	2.9	0.44	5.4	2.4	0.45	2.1	0.37	ND	2.9	ND	1.1	1.1
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	0.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.32	0.31
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.05	0.071	0.078	0.13	0.085	0.073	0.1	0.084	ND UJ	0.1	0.15	0.081	ND UJ	0.12	0.1	--	0.052
Orthophosphate (as P)	mg/L	0.01	N/A	N/A	ND	0.021	0.02	0.072	0.032	0.024	0.026	0.014	0.087	0.033	0.076	0.037	0.26	0.048	0.047	--	0.015
Residual Chemicals																					

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24 Foxhall 1	MUN 1215 Foxhall 2	MUN 196 Forest Park	MUN 1224 Hogum Bay	MUN 722 Eagle Estates	MUN 1217 Lacey S16	MUN 210 Woodland Cr. Water #1	MUN 882 Thompson	MUN 237 Lacey S29	MUN 535A Lacey S31	MUN 1075 Lacey S22	MUN 1216 Lacey S07	SPR-SAC	SPR-DUP
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
1,7-Dimethylxanthine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND R	ND	ND	ND
2,4-D	ng/L	5	70	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nonylphenol	ng/L	100	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
4-tert-octylphenol	ng/L	50	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	57	ND	ND	ND
Acesulfame-K	ng/L	20	N/A	N/A	ND	ND	ND	ND	25	140	ND	1900	410	ND	190	1600	ND	200	ND	87	76
Acetaminophen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND
Albuterol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Amoxicillin (semi-quantitative)	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Andorostenedione	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atenolol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine	ng/L	5	3000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Azithromycin	ng/L	20	N/A	N/A	--	--	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	160 J	ND UJ	ND UJ	ND UJ	200 J	ND UJ	ND UJ	ND UJ	ND UJ
Bendroflumethiazide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bezafibrate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BPA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromacil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
Butalbital	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylparben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caffeine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbadox	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
Carbamazepine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carisoprodol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloramphenicol	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloridazon	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND UJ	ND	ND	ND
Chlorotoluron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cimetidine	ng/L	5	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Clofibric Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cotinine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cya--zine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6	ND	ND	ND	ND
DACT	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DEA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DEET	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dehydronifedipine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diazepam	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diclofenac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dilantin	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
Diltiazem	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Erythromycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12 J-	ND	ND	19 J+	ND	ND	ND
Estradiol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Estrone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethinyl Estradiol - 17 alpha	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Flumeqine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoxetine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gemfibrozil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.9	ND	ND	ND	ND
Ibuprofen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iohexal	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iopromide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN 210	MUN 882	MUN 237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
								Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water #1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
Isobutylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isoproturon	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
Ketoprofen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ketorolac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lidocaine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
Lincomycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Linuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lopressor	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND
Meclofenamic Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Meprobamate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metazachlor	ng/L	5	N/A	N/A	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R
Metformin	ng/L	10	N/A	N/A	ND	ND	ND	--	--	--	98	--	--	ND	--	--	--	--	--	54	56
Methylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metolachlor	ng/L	5	N/A	N/A	--	--	--	ND R	ND R	ND R	ND R	ND R	ND R	--	ND R	ND R	ND R	ND R	ND R	--	--
Naproxen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nifedipine	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Norethisterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OUST (Sulfameturon,methyl)	ng/L	5	N/A	N/A	--	--	--	ND	ND	ND	--	ND	ND	--	ND	ND	ND	ND	ND	--	--
Oxolinic acid	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentoxifylline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND UJ	ND	ND	ND
Phenazone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Primidone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Progesterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quinoline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
Simazine	ng/L	5	4000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sucralose	ng/L	100	N/A	N/A	ND	ND	110	ND	ND	ND	ND	710	ND	ND	ND	600	ND	150	ND	170	140
Sulfachloropyridazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfadiazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND R	ND UJ	ND	ND	ND
Sulfadimethoxine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamerazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethizole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethoxazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfathiazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCEP	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCPP	ng/L	100	N/A	N/A	ND	ND	ND	150	120	120	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
TDCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	310
Testosterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theobromine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theophylline	ng/L	20	N/A	N/A	--	--	--	ND UJ	ND UJ	ND UJ	--	ND UJ	ND UJ	--	ND UJ	ND UJ	ND R	ND UJ	ND UJ	--	--
Thiabendazole	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Triclocarban	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Triclosan	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trimethoprim	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Warfarin	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PFCs																					
Perfluoro butanoic acid-PFBA	ng/L	10	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN 210	MUN 882	MUN 237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
								Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water #1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
Perfluoro octanesulfonic acid - PFOS	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro octanesulfonate-PFOS	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro octanoic acid - PFOA	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-1-butanesulfonate	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-1-butanesulfonic acid	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-1-hexanesulfonate	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-1-hexanesulfonic acid	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-n-decanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-n-heptanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-n-hexanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoro-n-nonanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Perfluoropentanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
DBPs																					
Chloroform (Trichloromethane)	µg/L	0.5	N/A	7	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromoform	µg/L	0.5	N/A	5	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromodichloromethane	µg/L	0.5	N/A	0.3	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chlorodibromomethane	µg/L	0.5	N/A	0.5	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Total THM	µg/L	0.5	80	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bacteria																					
E. Coli Bacteria (P/A)	P/A	--	N/A	N/A	--	A UJ	A UJ	A UJ	A UJ	A UJ	A UJ	A UJ	A	P J	A UJ	A UJ	A	A UJ	A UJ	P J	P J
E. Coli Bacteria	MPN/ 100 mL	1.1	N/A	N/A	--	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1	1.1 J	<1.1 J	<1.1 J	<1	<1.1 J	<1.1 J	>23 J	>23 J
Total Coliform Bacteria (P/A)	P/A	--	N/A	N/A	--	A UJ	A UJ	A UJ	A UJ	A UJ	A UJ	A UJ	A	P J	A UJ	A UJ	A	A UJ	A UJ	P J	P J
Total Coliform Bacteria	MPN/ 100 mL	1.1	N/A	N/A	<1	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1.1 J	<1	6.9 J	<1.1 J	<1.1 J	<1	<1.1 J	<1.1 J	>23 J	>23 J
Other Organics																					
PCB 1016 Aroclor	µg/L	0.08	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
PCB 1221 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
PCB 1232 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
PCB 1242 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
PCB 1248 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
PCB 1254 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
PCB 1260 Aroclor	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Total PCBs	µg/L	0.1	0.5	0.01	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Pesticides and Herbicides																					
Alachlor (Alanex)	µg/L	0.1	2	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Aldrin	µg/L	0.01	N/A	0.005	ND UJ	ND UJ	ND UJ	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chlordane	µg/L	0.1	2	0.06	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dieldrin	µg/L	0.01	N/A	0.005	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Endrin	µg/L	0.01	2	0.2	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Heptachlor	µg/L	0.01	0.4	0.02	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Heptachlor Epoxide	µg/L	0.01	0.2	0.009	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Lindane (gamma-BHC)	µg/L	0.01	0.2	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Methoxychlor	µg/L	0.05	40	100	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Toxaphene	µg/L	0.5	3	0.08	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN 210	MUN 882	MUN 237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
								Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water #1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
2,4,5-T	µg/L	0.2	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
2,4,5-TP (Silvex)	µg/L	0.2	50	10	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
2,4-D	µg/L	0.1	70	100	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
2,4-DB	µg/L	2	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
3,5-Dichlorobenzoic acid	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Acifluorfen	µg/L	0.2	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bentazon	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dalapon	µg/L	1	200	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dicamba	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dichlorprop	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dinoseb	µg/L	0.2	7	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Pentachlorophenol	µg/L	0.04	1	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Picloram	µg/L	0.1	500	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Tot DCPA Mono&Diacid Degradate	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
VOCs																					
1,1,1,2-Tetrachloroethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,1,1-Trichloroethane	µg/L	0.5	200	0.2	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,1,2,2-Tetrachloroethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,1,2-Trichloroethane	µg/L	0.5	5	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,1-Dichloroethane	µg/L	0.5	N/A	1	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,1-Dichloroethylene	µg/L	0.5	7	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,1-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,2,3-Trichlorobenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,2,3-Trichloropropane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,2,4-Trichlorobenzene	µg/L	0.5	70	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,2,4-Trimethylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,2-Dichloroethane	µg/L	0.5	5	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,2-Dichloropropane	µg/L	0.5	5	0.6	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,3,5-Trimethylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
1,3-Dichloropropane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
2,2-Dichloropropane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
2-Butanone (MEK)	µg/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
2-Hexanone	µg/L	10	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
4-Methyl-2-Pentanone (MIBK)	µg/L	5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Benzene	µg/L	0.5	5	1	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromobenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromochloromethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromoethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromomethane (Methyl Bromide)	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Carbon disulfide	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Carbon Tetrachloride	µg/L	0.5	5	0.3	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chlorobenzene	µg/L	0.5	100	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chloroethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chloromethane(Methyl Chloride)	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
cis-1,2-Dichloroethylene	µg/L	0.5	70	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
cis-1,3-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dibromomethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN 210	MUN 882	MUN 237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
								Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water #1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
Dichlorodifluoromethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dichloromethane	µg/L	0.5	5	5	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Di-isopropyl ether	µg/L	3	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Ethyl benzene	µg/L	0.5	700	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Hexachlorobutadiene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Isopropylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
m,p-Xylenes	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
m-Dichlorobenzene (1,3-DCB)	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Methyl Tert-butyl ether (MTBE)	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Naphthalene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
n-Butylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
n-Propylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
o-Chlorotoluene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
o-Dichlorobenzene (1,2-DCB)	µg/L	0.5	600	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
o-Xylene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
p-Chlorotoluene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
p-Dichlorobenzene (1,4-DCB)	µg/L	0.5	75	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
p-Isopropyltoluene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
sec-Butylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Styrene	µg/L	0.5	100	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
tert-amyl Methyl Ether	µg/L	3	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
tert-Butyl Ethyl Ether	µg/L	3	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
tert-Butylbenzene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Tetrachloroethylene (PCE)	µg/L	0.5	5	0.8	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Toluene	µg/L	0.5	1000	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Total 1,3-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Total xylenes	µg/L	0.5	10000	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
trans-1,2-Dichloroethylene	µg/L	0.5	100	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
trans-1,3-Dichloropropene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Trichloroethylene (TCE)	µg/L	0.5	5	3	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Trichlorofluoromethane	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Trichlorotrifluoroethane (Freon 113)	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Vinyl chloride (VC)	µg/L	0.3	2	0.02	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
SVOCs																					
2,4-Dinitrotoluene	µg/L	0.1	N/A	0.1	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
2,6-Dinitrotoluene	µg/L	0.1	N/A	0.1	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
4,4-DDD	µg/L	0.1	N/A	0.3	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
4,4-DDE	µg/L	0.1	N/A	0.3	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
4,4-DDT	µg/L	0.1	N/A	0.3	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Acenaphthene	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Acenaphthylene	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Acetochlor	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Alachlor	µg/L	0.05	2	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Aldrin	µg/L	0.01	N/A	0.005	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Alpha-BHC	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
alpha-Chlordane	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN 210	MUN 882	MUN 237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
								Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water #1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
Anthracene	µg/L	0.02	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Atrazine	µg/L	0.05	3	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Benz(a)Anthracene	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Benzo(a)pyrene	µg/L	0.02	0.2	0.008	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Benzo(b)Fluoranthene	µg/L	0.02	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Benzo(g,h,i)Perylene	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Benzo(k)Fluoranthene	µg/L	0.02	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Beta-BHC	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Bromacil	µg/L	0.2	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Butachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Butylbenzylphthalate	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chlorobenzilate	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chloroneb	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chlorothalonil(Draconil,Bravo)	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chlorpyrifos (Dursban)	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Chrysene	µg/L	0.02	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Delta-BHC	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Di-(2-Ethylhexyl)adipate	µg/L	0.6	400	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Di(2-Ethylhexyl)phthalate	µg/L	0.6	6	N/A	ND	1.2	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Diazinon (Qualitative)	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dibenz(a,h)Anthracene	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dichlorvos (DDVP)	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dieldrin	µg/L	0.01	N/A	0.005	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Diethylphthalate	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dimethoate	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Dimethylphthalate	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Di-n-Butylphthalate	µg/L	1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Di-N-octylphthalate	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Endosulfan I (Alpha)	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Endosulfan II (Beta)	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Endosulfan Sulfate	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Endrin	µg/L	0.01	2	0.2	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Endrin Aldehyde	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
EPTC	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Fluoranthene	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Fluorene	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
gamma-Chlordane	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Heptachlor	µg/L	0.01	0.4	0.02	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Heptachlor Epoxide (isomer B)	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Hexachlorobenzene	µg/L	0.05	1	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Hexachlorocyclopentadiene	µg/L	0.05	50	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Indeno(1,2,3,c,d)Pyrene	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Isophorone	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Lindane	µg/L	0.04	0.2	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Malathion	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Methoxychlor	µg/L	0.05	40	100	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Metolachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Metribuzin	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Molinate	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND

Analyte	Units	MRL	Drinking Water Standard (1)	Ground-water Quality Standard (2)	Shallow Aquifer Residential Wells			Municipal Wells Shallow Aquifer						Municipal Wells Deep Aquifer						Springs	
					RES12	RES70	RES179	MUN 24	MUN 1215	MUN 196	MUN 1224	MUN 722	MUN 1217	MUN 210	MUN 882	MUN 237	MUN 535A	MUN 1075	MUN 1216	SPR-SAC	SPR-DUP
								Foxhall 1	Foxhall 2	Forest Park	Hogum Bay	Eagle Estates	Lacey S16	Woodland Cr. Water #1	Thompson	Lacey S29	Lacey S31	Lacey S22	Lacey S07		
					4/24/15	5/1/15	5/12/15	5/7/15	5/7/15	5/7/15	5/18/15	5/7/15	5/3/16	5/27/15	5/7/15	5/6/15	5/3/16	5/6/15	5/6/15	6/4/15	6/4/15
Naphthalene	µg/L	0.5	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Parathion	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Pendimethalin	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Pentachlorophenol	µg/L	0.04	1	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Permethrin (mixed isomers)	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Phenanthrene	µg/L	0.04	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Propachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Pyrene	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Simazine	µg/L	0.05	4	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Terbacil	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Terbuthylazine	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Thiobencarb	µg/L	0.2	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Total PAH	µg/L	0.02	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
trans-Nonachlor	µg/L	0.05	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND
Trifluralin	µg/L	0.1	N/A	N/A	ND	ND	ND	--	--	--	ND	--	--	ND	--	--	--	--	--	ND	ND

MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl; PBDE = Polybrominated Diphenyl Ether; VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound; P = present; A = absent

Notes:

(1) Drinking Water Standards established by the Washington State Department of Health in 246-290 WAC. Includes Federal MCL Drinking Water Standards.

(2) Groundwater Quality Standard: Established by the Washington State Department of Ecology in WAC 173-200-040.

J = Value is detected and the result is estimated

J- = Value is detected and the result is estimated and biased low

UJ = Result is a non-detect and the value is estimated

R = Result rejected

*Drinking water and groundwater quality standards are for total metals.

Table E-3. Groundwater quality analytical results from Tumwater Study Area residential wells.

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
General Water Quality Parameters																									
Bicarbcarbonate Alkalinity (as HCO_3)	mg/L	2	N/A	N/A	64	64	47	66	78	78	69	40	25	77	43	37	36	35	48	52	58	48	100	91	84
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	53	52	38	54	64	64	57	33	21	63	35	30	30	29	40	42	48	39	86	74	68
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	umho/cm	2	700	N/A	150	130	86	160	210	200	160	120	74	130	120	92	90	130	130	120	140	140	200	190	250
Total Dissolved Solid (TDS)	mg/L	10	500	500	110	110	170	130	150	170	110	88	64	130	100	71	77	100	100	94	100	110	140	130	160
Total Organic Carbon	mg/L	0.3	N/A	N/A	0.3	0.3	ND	ND	ND	ND	0.49 J+	ND	ND	ND	ND	ND	ND	0.54	ND	0.31	0.47 J+	0.57 J+	ND	0.84	0.58
Bromide	ug/L	5	N/A	N/A	7.4	15	8.6	16	17	18	12	14	5.4	5.8	9.1	8.6	ND	51	52	7.3	100	14	18	78	67
Chloride	mg/L	1	250	250	2.7	2.8	1.8	4.5	3.6	3.5	6.4	5.1	3.7	2.2	5.2	3.2	2.2	7.3	7.2	2.4	5.9	5.3	4	2.8	5.3
Sulfate	mg/L	0.5	250	250	9.2	6.1	1.9	5.1	6	6	13	4.7	3.8	4.5	5.1	3.7	4.2	4.4	2.9	9	4.1	5.1	6.7	11	30
SulfideTotal	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	59	52	29	64	86	89	63	44	25	52	42	32	33	44	52	43	53	48	84	83	100
Anion Sum - Calculated	meq/L	0.001	N/A	N/A	1.4	1.3	0.86	1.5	2	1.9	1.6	1.1	0.69	1.4	1.1	0.87	0.86	1.2	1.2	1.1	1.3	1.3	2	1.9	2.4
Cation Sum - Calculated	meq/L	0.001	N/A	N/A	1.5	1.4	0.91	1.6	2.1	2.1	1.6	1.1	0.69	1.4	1.2	0.87	0.87	1.2	1.3	1.2	1.4	1.3	2.1	2	2.5
Metals (Dissolved)*																									
Aluminum	ug/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	ug/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND
Arsenic	ug/L	1	10	0.05	ND	1.4	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	1.7	ND	ND
Barium	ug/L	2	2000	1000	4.1	3	5.1	4.1	7.3	7.3	11	2.4	ND	2.4	2.5	ND	2.1	2.8	2.9	3.3	2.3	3.6	8	4	6
Beryllium	ug/L	1	4	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.5 UJ	ND	ND
Calcium	mg/L	1	N/A	N/A	13	10	5.9	15	19	20	10	12	7	11	11	8.4	8.5	12	13	9.5	13	12	14	22	26
Chromium	ug/L	1	100	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/L	2	1300	1000	4.8	ND	ND	180	ND	ND	ND	ND	27	ND	35	ND	130	110	3.7	2.1	2.8	6.3	ND	3.1	10
Iron	mg/L	0.02	0.3	0.3	ND	ND	0.31	ND	ND	ND	0.91	ND	ND	0.93	ND	0.1	ND	ND	ND	ND	ND	ND	0.19	0.027	0.021
Lead	ug/L	0.5	15	50	ND	ND	ND	ND	ND	ND	ND	ND	0.84	ND	0.83	ND	0.64	0.65	ND	ND	ND	ND	ND	0.84	ND
Magnesium	mg/L	0.1	N/A	N/A	6.4	6.7	3.5	6.4	9.4	9.6	9.2	3.3	1.8	5.9	3.6	2.8	2.8	3.4	4.7	4.6	5	4.5	12	6.8	8.4
Manganese	ug/L	2	50	50	ND	ND	110	ND	ND	ND	280	ND	ND	160	ND	ND	ND	ND	ND	18	8.4	ND	330	ND	6.6
Mercury	ug/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/L	1	N/A	N/A	2.1	2.1	2	1.5	1.8	1.8	2.4	ND	ND	2.1	1.1	ND	ND	ND	ND	2.1	1.1	1.4	3.1	ND	ND
Selenium	ug/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.428	N/A	N/A	37	39	43	34	38	38	28	27	26	58	32	27	31	25	30	37	31	29	37	26	29
Silver	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	6.6	6.7	6.3	6.6	6.9	7.1	6.4	4.9	4.4	6.6	6.6	5.1	4.9	7	5.7	6.9	6.3	6.9	7.5	8.1	12
Thallium	ug/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/L	20	5000	5000	27	ND	ND	ND	ND	ND	ND	ND	ND	50	79	21	160	ND	71	28	35	ND	39	48	ND
Nutrients																									
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	1.9	0.8	ND	2.8	6.5	6.2	ND	2.3	1.3	ND	2.5	1.4	1.6	4.6	2.5	0.35	1.8	3.1	ND	1.2	4.1
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	8.3	3.5	ND	12	29	27	ND	10	5.8	ND	11	6.1	7	20	11	1.6	7.9	14	ND	5.1	18
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	1.9	0.8	ND	2.8	6.5	6.2	ND	2.3	1.3	ND	2.5	1.4	1.6	4.6	2.5	0.35	1.8	3.1	ND	1.2	4.1

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	ND	0.093	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.2 UJ	ND	0.22	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.026	0.044	0.16	ND	0.074	0.043	ND	ND	0.061	0.13	ND	ND	0.027	ND	ND	0.13	ND	ND	0.021	ND	0.049
Orthophosphate as P	mg/L	0.01	N/A	N/A	0.026	0.051	0.1	0.017	0.019	0.016	0.022	0.014	0.02	0.073	0.013	0.017	0.012	0.011	0.015	0.12	ND	0.024	0.055	0.011	0.012
Residual Chemicals																									
1,7-Dimethylxanthine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND R	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
2,4-D	ng/L	5	70	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nonylphenol - semi quantitative	ng/L	100	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	**100 J**	ND UJ	ND UJ	ND UJ
4-tert-octylphenol	ng/L	50	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acesulfame-K	ng/L	20	N/A	N/A	460	ND	ND	840	ND	ND	ND	ND	20	ND	240	40	ND	460	40	ND	57	1500	ND	220	830
Acetaminophen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
Albuterol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Amoxicillin (semi-quantitative)	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Andorostenedione	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atenolol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine (Method LC-MS-MS)	ng/L	5	3000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Azithromycin	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Bendroflumethiazide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bezafibrate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BPA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromacil (Method LC-MS-MS)	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butalbital	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylparben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caffeine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbadox	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbamazepine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	66	ND	ND	ND
Carisoprodol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloramphenicol	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloridazon	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorotoluron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cimetidine	ng/L	5	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Clofibric Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cotinine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.1	7.6	7.5	ND	ND	ND
DACT	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DEA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DEET	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dehydronifedipine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diazepam	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diclofenac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dilantin	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diltiazem	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Erythromycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Estradiol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Estrone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethinyl Estradiol - 17 alpha	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Flumeqine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoxetine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gemfibrozil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ibuprofen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iohexal	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iopromide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isobutylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isoproturon	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ketoprofen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ketorolac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
Lidocaine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
Lincomycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Linuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lopressor	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Meclofenamic Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Meprobamate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metazachlor	ng/L	5	N/A	N/A	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R
Metformin	ng/L	10	N/A	N/A	ND	180	230	ND	ND	160	ND	ND	ND	210	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metolachlor	ng/L	5	N/A	N/A	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R
Naproxen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nifedipine	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Norethisterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OUST (Sulfameturon,methyl)	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxolinic acid	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentoxifylline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
Phenazone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
Primidone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Progesterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	6.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quinoline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Simazine	ng/L	5	4000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sucralose	ng/L	100	N/A	N/A	240	ND	ND	590	ND	ND	ND	ND	ND	ND	350	ND	ND	470	180	ND	130	1200	ND	620	1500
Sulfachloropyridazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfadiazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND R	ND	ND	ND	ND	ND
Sulfadimethoxine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamerazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethizole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethoxazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfathiazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCEP	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
TDCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Testosterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theobromine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theophylline	ng/L	20	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thiabendazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND R	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
Triclocarban	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Triclosan	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trimethoprim	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND
Warfarin	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PFCs																									
Perfluoro butanoic acid-PFBA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro octanesulfonate-PFOS	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro octanesulfonic acid - PFOS	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro octanoic acid - PFOA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-1-butanesulfonate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-1-butanesulfonic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-1-hexanesulfonate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-1-hexanesulfonic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-n-decanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-n-heptanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-n-hexanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoro-n-nonanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoropentanoic acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DBPs																									
Chloroform (Trichloromethane)	ug/L	0.5	N/A	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ug/L	0.5	N/A	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/L	0.5	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ug/L	0.5	N/A	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total THM	ug/L	0.5	80	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bacteria																									
E. Coli Bacteria (P/A)		0	A	N/A	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J
E. Coli Bacteria	MPN/100 mL	1	1	N/A	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J
Fecal Coliform Bacteria (P/A)	P/A	0	A	N/A	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	A J	P J	A J	A J	A J	A J	A J
Fecal Coliform	MPN/100	1	1	N/A	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	1 J	<1 J	<1 J	<1 J	<1 J	<1 J

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
	mL																								
Total Coliform Bacteria (P/A)	P/A	0	A	N/A	A J	A J	P J	A J	A J	P J	A J	P J	A J	P J	P J	A J	A J	A J	A J	A J	A J	P J	P J	A J	A J
Total Coliform Bacteria	MPN/ 100 mL	1	1	N/A	<1 J	<1 J	1 J	<1 J	<1 J	1 J	<1 J	4.1 J	<1 J	82 J	1400 J	<1 J	<1 J	<1 J	<1 J	<1 J	<1 J	6.2 J	11 J	<1 J	<1 J
PCBs																									
PCB 1016 Aroclor	ug/L	0.08	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1221 Aroclor	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1232 Aroclor	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1242 Aroclor	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1248 Aroclor	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1254 Aroclor	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1260 Aroclor	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCBs	ug/L	0.1	0.5	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides and Herbicides																									
Alachlor (Alanex)	ug/L	0.1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin (EPA Method 505)	ug/L	0.01	N/A	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND
Chlordane	ug/L	0.1	2	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin (EPA Method 505)	ug/L	0.01	N/A	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin (EPA Method 505)	ug/L	0.01	2	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor (EPA Method 505)	ug/L	0.01	0.4	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	ug/L	0.01	0.2	0.009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lindane (gamma-BHC)	ug/L	0.01	0.2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor (EPA Method 505)	ug/L	0.05	40	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	ug/L	0.5	3	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-T	ug/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-TP (Silvex)	ug/L	0.2	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-D (EPA Method 515.4)	ug/L	0.1	70	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DB	ug/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,5-Dichlorobenzoic acid	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acifluorfen	ug/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bentazon	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dalapon	ug/L	1	200	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dicamba	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorprop	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dinoseb	ug/L	0.2	7	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ug/L	0.04	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Picloram	ug/L	0.1	500	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tot DCPA Mono&Diacid Degradate	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VOCs																									
1,1,1,2-	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Tetrachloroethane																									
1,1,1-Trichloroethane	ug/L	0.5	200	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/L	0.5	5	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/L	0.5	N/A	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/L	0.5	7	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND UJ	ND UJ	ND	ND	ND UJ
1,2,3-Trichloropropane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/L	0.5	70	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/L	0.5	5	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/L	0.5	5	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
2-Butanone (MEK)	ug/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone (MIBK)	ug/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/L	0.5	5	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoethane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane (Methyl Bromide)	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/L	0.5	5	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane(Methyl Chloride)	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/L	0.5	70	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	ug/L	0.5	5	5	ND UJ	ND	ND UJ	ND UJ	ND UJ	ND	ND	ND	ND UJ	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND UJ	ND
Di-isopropyl ether	ug/L	3	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/L	0.5	700	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
Isopropylbenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (1,3-DCB)	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND UJ	ND	ND	ND
n-Butylbenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
o-Chlorotoluene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (1,2-DCB)	ug/L	0.5	600	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Chlorotoluene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (1,4-DCB)	ug/L	0.5	75	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-amyl Methyl Ether	ug/L	3	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl Ethyl Ether	ug/L	3	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/L	0.5	5	0.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/L	0.5	1000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total 1,3-Dichloropropene	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total xylenes	ug/L	0.5	10000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/L	0.5	N/A	N/A	ND	ND UJ	ND	ND	ND	ND UJ	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ
Trichloroethylene (TCE)	ug/L	0.5	5	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride (VC)	ug/L	0.3	2	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs																									
2,4-Dinitrotoluene	ug/L	0.1	N/A	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	ug/L	0.1	N/A	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDD	ug/L	0.1	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDE	ug/L	0.1	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDT	ug/L	0.1	N/A	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetochlor	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alachlor	ug/L	0.05	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin (EPA Method 525.2)	ug/L	0.05	N/A	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alpha-BHC	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-Chlordane	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ug/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine	ug/L	0.05	3	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benz(a)Anthracene	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/L	0.02	0.2	0.008	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)Fluoranthene	ug/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)Perylene	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene	ug/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beta-BHC	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Bromacil	ug/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butachlor	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzylphthalate	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzilate	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroneb	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorothalonil(Draconil, Bravo)	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorpyrifos (Dursban)	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ug/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Delta-BHC	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-(2-Ethylhexyl)adipate	ug/L	0.6	400	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di(2-Ethylhexyl)phthalate	ug/L	0.6	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diazinon (Qualitative)	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)Anthracene	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorvos (DDVP)	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin (EPA Method 525.2)	ug/L	0.2	N/A	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethoate	ug/L	0.1	N/A	N/A	ND	ND	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND	ND UJ	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND UJ	ND	ND UJ
Dimethylphthalate	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-Butylphthalate	ug/L	1	N/A	N/A	ND UJ	ND UJ	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND UJ	ND	ND UJ	ND	ND	ND UJ	ND	ND	ND	ND UJ	ND
Di-N-octylphthalate	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I (Alpha)	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II (Beta)	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin (EPA Method 525.2)	ug/L	0.2	2	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin Aldehyde	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPTC	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-Chlordane	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor (EPA Method 525.2)	ug/L	0.03	0.4	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide (isomer B)	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	ug/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ug/L	0.05	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3,c,d)Pyrene	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ug/L	0.5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lindane	ug/L	0.04	0.2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Malathion	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor (EPA Method 525.2)	ug/L	0.1	40	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metolachlor	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metribuzin	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molinate	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene (EPA Method 525.2)	ug/L	0.3	N/A	N/A	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ

Analyte	Unit	MRL	Drinking Water Std[1]	Groundwater Quality Std[2]	RES-11	RES-30	RES-58	RES-126	RES-127	127-DUP	RES-140	RES-197	RES-202	RES-335	RES-403	RES-425	RES-484	RES-505	RES-508	RES-521	RES-522	RES - 556	RES-622	RES-632	RES-638
					8/28/15	8/27/15	8/31/15	8/31/15	9/1/15	9/1/15	8/25/15	8/26/15	9/1/15	9/3/15	8/28/15	8/26/15	8/28/15	8/25/15	8/26/15	8/27/15	8/24/15	8/24/15	8/31/15	8/27/15	9/1/15
Parathion	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pendimethalin	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ug/L	1	1	N/A	ND	ND	ND UJ	ND UJ	ND UJ	ND UJ	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND UJ	ND	ND	ND UJ
Permethrin (mixed isomers)	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ug/L	0.04	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propachlor	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Simazine (EPA Method 525.2)	ug/L	0.05	4	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Terbacil	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Terbuthylazine	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiobencarb	ug/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAH	ug/L	0.02	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-Nonachlor	ug/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trifluralin	ug/L	0.1	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl; PBDE = Polybrominated Diphenyl Ether; VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound; P = present; A = absent

(1) Established by the Washington State Department of Health in 246-290 WAC. Bacteria drinking water standards are listed in WAC 246-290-310(2)

(2) Established by the Washington State Department of Ecology in WAC 173-200-040

J = Value is detected and the result is estimated

J- = Value is detected and the result is estimated and biased low

UJ = Result is a non-detect and the value is estimated

R = Result rejected

*Drinking water and groundwater quality standards are for total metals.

Table E-4. Groundwater quality analytical results for Tumwater Study Area municipal supply wells.

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
General Water Quality Parameters														
Bicarbcarbonate Alkalinity (as HCO_3)	mg/L	2	--	N/A	97	53	64	65	81	110	62	66	57	70
Alkalinity (as $CaCO_3$)	mg/L	2	N/A	N/A	80	44	52	54	66	90	51	54	47	58
Carbonate (CO_3)	mg/L	2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific Conductance	umho/cm	2	700	N/A	180	120	140	130	160	200	140	140	140	200
Total Dissolved Solid (TDS)	mg/L	10	500	500	130	110	120	100	120	140	110	110	120	150
Total Organic Carbon	mg/L	0.3	N/A	N/A	ND	ND	0.34	ND	ND	0.3	ND	0.31	ND	0.3
Bromide	ug/L	5	N/A	N/A	21	14	24	12	16	27	11	22	14	15
Chloride	mg/L	1	250	250	3.9	4.1	4	3.2	3.4	3.7	3.3	3.3	3.4	5.9
Sulfate	mg/L	0.5	250	250	3.4	4.2	5.9	4	4.1	4.3	3.4	4.5	4.7	9.5
SulfideTotal	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Hardness as CaCO3	mg/L	3	N/A	N/A	78	44	54	55	70	89	56	57	57	78
Anion Sum - Calculated	meq/L	0.001	N/A	N/A	1.8	1.2	1.4	1.3	1.6	2	1.4	1.4	1.4	1.9
Cation Sum - Calculated	meq/L	0.001	N/A	N/A	2	1.2	1.4	1.4	1.7	2.2	1.4	1.4	1.5	1.9
Metals (Dissolved)*														
Aluminum	ug/L	20	50	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	ug/L	1	6	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/L	1	10	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ug/L	2	2000	1000	2.6	2.6	4.5	3.3	4.6	4.8	2.2	3.6	2.5	5.1
Beryllium	ug/L	1	4	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/L	0.5	5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	N/A	N/A	16	10	12	13	15	19	12	12	12	16
Chromium	ug/L	1	100	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/L	2	1300	1000	ND	ND	ND	4.2	10	4.9	ND	ND	ND	ND
Iron	mg/L	0.02	0.3	0.3	ND	ND	ND	ND	ND	ND	ND	0.049	ND	ND
Lead	ug/L	0.5	15	50	ND	ND	ND	ND	2	ND	ND	ND	ND	ND
Magnesium	mg/L	0.1	N/A	N/A	9.2	4.7	5.9	5.4	7.8	10	6.4	6.6	6.6	9.3
Manganese	ug/L	2	50	50	ND	ND	7.1	ND	ND	ND	ND	3.6	ND	ND
Mercury	ug/L	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/L	5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/L	1	N/A	N/A	2.1	1.2	1.5	1.4	2.2	2.7	1.4	1.5	1.6	1.9
Selenium	ug/L	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.428	N/A	N/A	38	33	33	35	36	42	30	38	33	40
Silver	ug/L	0.5	100	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	mg/L	1	N/A	N/A	7.6	5.6	6.3	5.5	6.2	7.4	6.1	5.9	6.1	7.4
Thallium	ug/L	1	2	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/L	20	5000	5000	ND	ND	43	ND	ND	ND	24	ND	ND	ND
Nutrients														
Nitrate+Nitrite	mg/L	0.1	N/A	N/A	0.81	1.1	1.3	0.9	1.1	0.68	2.6	1.3	3.4	4.8
Nitrate as NO3 (calc)	mg/L	0.44	N/A	N/A	3.6	5	5.8	4	5	3	11	5.9	15	22
Nitrate as Nitrogen by IC	mg/L	0.1	10	10	0.81	1.1	1.3	0.9	1.1	0.68	2.6	1.3	3.4	4.8

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Nitrite	mg/L	0.05	1	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia Nitrogen	mg/L	0.05	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.2	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Total Phosphorus	mg/L	0.02	N/A	N/A	0.1	0.038	0.053	0.041	0.042	0.059	0.07	0.05	0.038	0.037
Orthophosphate as P	mg/L	0.01	N/A	N/A	0.068	0.022	0.03	0.014	0.017	0.028	0.038	0.019	0.023	0.02
Residual Chemicals														
1,7-Dimethylxanthine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-D	ng/L	5	70	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nonylphenol - semi quantitative	ng/L	100	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
4-tert-octylphenol	ng/L	50	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acesulfame-K	ng/L	20	N/A	N/A	ND	33	ND	ND	28	ND	ND	ND	21	190
Acetaminophen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Albuterol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Amoxicillin (semi-quantitative)	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Andorostenedione	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atenolol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine (Method LC-MS-MS)	ng/L	5	3000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Azithromycin	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Bendroflumethiazide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bezafibrate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BPA	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromacil (Method LC-MS-MS)	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butalbital	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylparben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caffeine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbadox	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbamazepine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carisoprodol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloramphenicol	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloridazon	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	7.5	ND	ND
Chlorotoluron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cimetidine	ng/L	5	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Clofibric Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cotinine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	12	ND	ND
DACT	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DEA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DEET	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dehydronifedipine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIA	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diazepam	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diclofenac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Dilantin	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diltiazem	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Erythromycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Estradiol	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Estrone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethinyl Estradiol - 17 alpha	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Flumeqine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoxetine	ng/L	10	N/A	N/A	ND	ND	ND	ND	12	ND	ND	ND	ND	ND
Gemfibrozil	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ibuprofen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iohexal	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iopromide	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isobutylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isoproturon	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ketoprofen	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ketorolac	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lidocaine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lincomycin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Linuron	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lopressor	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Meclofenamic Acid	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Meprobamate	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metazachlor	ng/L	5	N/A	N/A	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R
Metformin	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylparaben	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metolachlor	ng/L	5	N/A	N/A	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R	ND R
Naproxen	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nifedipine	ng/L	20	N/A	N/A	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Norethisterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OUST (Sulfameturon,methyl)	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxolinic acid	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentoxifylline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenazone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Primidone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Progesterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propylparaben	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quinoline	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Simazine	ng/L	5	4000	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sucralose	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfachloropyridazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfadiazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfadimethoxine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Sulfamerazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethazine	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethizole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfamethoxazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfathiazole	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCEP	ng/L	10	N/A	N/A	ND	ND	50	ND	ND	ND	ND	ND	ND	ND
TCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TDCPP	ng/L	100	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Testosterone	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theobromine	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Theophylline	ng/L	20	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiabendazole	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Triclocarban	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Triclosan	ng/L	10	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trimethoprim	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Warfarin	ng/L	5	N/A	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PFCs														
Perfluoro butanoic acid-PFBA	ng/L	10	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro octanesulfonate-PFOS	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro octanesulfonic acid - PFOS	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro octanoic acid - PFOA	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-1-butanesulfonate	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-1-butanesulfonic acid	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-1-hexanesulfonate	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-1-hexanesulfonic acid	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-n-decanoic acid	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-n-heptanoic acid	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-n-hexanoic acid	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoro-n-nonanoic acid	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Perfluoropentanoic acid	ng/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
DBPs														
Chloroform (Trichloromethane)	ug/L	0.5	N/A	7	--	--	--	--	--	--	--	--	--	--
Bromoform	ug/L	0.5	N/A	5	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	ug/L	0.5	N/A	0.3	--	--	--	--	--	--	--	--	--	--
Chlorodibromomethane	ug/L	0.5	N/A	0.5	--	--	--	--	--	--	--	--	--	--
Total THM	ug/L	0.5	80	N/A	--	--	--	--	--	--	--	--	--	--
Bacteria														
E. Coli Bacteria (P/A)		0	A	N/A	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
E. Coli Bacteria	MPN/ 100 mL	1	1	N/A	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ
Fecal Coliform Bacteria (P/A)	P/A	0	A	N/A	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ
Fecal Coliform	MPN/ 100 mL	1	1	N/A	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ
Total Coliform Bacteria (P/A)	P/A	0	A	N/A	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	< UJ	P J
Total Coliform Bacteria	MPN/ 100 mL	1	1	N/A	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	9.7 J
PCBs														
PCB 1016 Aroclor	ug/L	0.08	N/A	N/A	--	--	--	--	--	--	--	--	--	--
PCB 1221 Aroclor	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
PCB 1232 Aroclor	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
PCB 1242 Aroclor	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
PCB 1248 Aroclor	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
PCB 1254 Aroclor	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
PCB 1260 Aroclor	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/L	0.1	0.5	0.01	--	--	--	--	--	--	--	--	--	--
Pesticides and Herbicides														
Alachlor (Alanex)	ug/L	0.1	2	N/A	--	--	--	--	--	--	--	--	--	--
Aldrin (EPA Method 505)	ug/L	0.01	N/A	0.005	--	--	--	--	--	--	--	--	--	--
Chlordane	ug/L	0.1	2	0.06	--	--	--	--	--	--	--	--	--	--
Dieldrin (EPA Method 505)	ug/L	0.01	N/A	0.005	--	--	--	--	--	--	--	--	--	--
Endrin (EPA Method 505)	ug/L	0.01	2	0.2	--	--	--	--	--	--	--	--	--	--
Heptachlor (EPA Method 505)	ug/L	0.01	0.4	0.02	--	--	--	--	--	--	--	--	--	--
Heptachlor Epoxide	ug/L	0.01	0.2	0.009	--	--	--	--	--	--	--	--	--	--
Lindane (gamma-BHC)	ug/L	0.01	0.2	N/A	--	--	--	--	--	--	--	--	--	--
Methoxychlor (EPA Method 505)	ug/L	0.05	40	100	--	--	--	--	--	--	--	--	--	--
Toxaphene	ug/L	0.5	3	0.08	--	--	--	--	--	--	--	--	--	--
2,4,5-T	ug/L	0.2	N/A	N/A	--	--	--	--	--	--	--	--	--	--
2,4,5-TP (Silvex)	ug/L	0.2	50	10	--	--	--	--	--	--	--	--	--	--
2,4-D (EPA Method 515.4)	ug/L	0.1	70	100	--	--	--	--	--	--	--	--	--	--
2,4-DB	ug/L	2	N/A	N/A	--	--	--	--	--	--	--	--	--	--
3,5-Dichlorobenzoic acid	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Acifluorfen	ug/L	0.2	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Bentazon	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dalapon	ug/L	1	200	N/A	--	--	--	--	--	--	--	--	--	--
Dicamba	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dichlorprop	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dinoseb	ug/L	0.2	7	N/A	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	ug/L	0.04	1	N/A	--	--	--	--	--	--	--	--	--	--
Picloram	ug/L	0.1	500	N/A	--	--	--	--	--	--	--	--	--	--
Tot DCPA Mono&Diacid Degradate	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
VOCs														
1,1,1,2-Tetrachloroethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	ug/L	0.5	200	0.2	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	0.5	5	N/A	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	ug/L	0.5	N/A	1	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	ug/L	0.5	7	N/A	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	ug/L	0.5	70	N/A	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	ug/L	0.5	5	N/A	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	ug/L	0.5	5	0.6	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
2-Butanone (MEK)	ug/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
2-Hexanone	ug/L	10	N/A	N/A	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-Pentanone (MIBK)	ug/L	5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Benzene	ug/L	0.5	5	1	--	--	--	--	--	--	--	--	--	--
Bromobenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Bromochloromethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Bromoethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Bromomethane (Methyl Bromide)	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	ug/L	0.5	5	0.3	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	ug/L	0.5	100	N/A	--	--	--	--	--	--	--	--	--	--
Chloroethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Chloromethane(Methyl Chloride)	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethylene	ug/L	0.5	70	N/A	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dibromomethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dichloromethane	ug/L	0.5	5	5	--	--	--	--	--	--	--	--	--	--
Di-isopropyl ether	ug/L	3	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	ug/L	0.5	700	N/A	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
m-Dichlorobenzene (1,3-DCB)	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Methyl Tert-butyl ether (MTBE)	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Naphthalene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
o-Chlorotoluene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
o-Dichlorobenzene (1,2-DCB)	ug/L	0.5	600	N/A	--	--	--	--	--	--	--	--	--	--
o-Xylene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
p-Chlorotoluene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
p-Dichlorobenzene (1,4-DCB)	ug/L	0.5	75	N/A	--	--	--	--	--	--	--	--	--	--
p-Isopropyltoluene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Styrene	ug/L	0.5	100	N/A	--	--	--	--	--	--	--	--	--	--
tert-amyl Methyl Ether	ug/L	3	N/A	N/A	--	--	--	--	--	--	--	--	--	--
tert-Butyl Ethyl Ether	ug/L	3	N/A	N/A	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene (PCE)	ug/L	0.5	5	0.8	--	--	--	--	--	--	--	--	--	--
Toluene	ug/L	0.5	1000	N/A	--	--	--	--	--	--	--	--	--	--
Total 1,3-Dichloropropene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Total xylenes	ug/L	0.5	10000	N/A	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethylene	ug/L	0.5	100	N/A	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Trichloroethylene (TCE)	ug/L	0.5	5	3	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Trichlorotrifluoroethane (Freon 113)	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Vinyl chloride (VC)	ug/L	0.3	2	0.02	--	--	--	--	--	--	--	--	--	--
SVOCs														
2,4-Dinitrotoluene	ug/L	0.1	N/A	0.1	--	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	ug/L	0.1	N/A	0.1	--	--	--	--	--	--	--	--	--	--
4,4-DDD	ug/L	0.1	N/A	0.3	--	--	--	--	--	--	--	--	--	--
4,4-DDE	ug/L	0.1	N/A	0.3	--	--	--	--	--	--	--	--	--	--
4,4-DDT	ug/L	0.1	N/A	0.3	--	--	--	--	--	--	--	--	--	--
Acenaphthene	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Acetochlor	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Alachlor	ug/L	0.05	2	N/A	--	--	--	--	--	--	--	--	--	--
Aldrin (EPA Method 525.2)	ug/L	0.05	N/A	0.005	--	--	--	--	--	--	--	--	--	--
Alpha-BHC	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
alpha-Chlordane	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Anthracene	ug/L	0.02	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Atrazine	ug/L	0.05	3	N/A	--	--	--	--	--	--	--	--	--	--
Benz(a)Anthracene	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.02	0.2	0.008	--	--	--	--	--	--	--	--	--	--
Benzo(b)Fluoranthene	ug/L	0.02	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)Perylene	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Benzo(k)Fluoranthene	ug/L	0.02	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Beta-BHC	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Bromacil	ug/L	0.2	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Butachlor	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Butylbenzylphthalate	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Chlorobenzilate	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Chloroneb	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Chlorothalonil(Draconil, Bravo)	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Chlorpyrifos (Dursban)	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Chrysene	ug/L	0.02	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Delta-BHC	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Di-(2-Ethylhexyl)adipate	ug/L	0.6	400	N/A	--	--	--	--	--	--	--	--	--	--
Di(2-Ethylhexyl)phthalate	ug/L	0.6	6	N/A	--	--	--	--	--	--	--	--	--	--
Diazinon (Qualitative)	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)Anthracene	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dichlorvos (DDVP)	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dieldrin (EPA Method 525.2)	ug/L	0.2	N/A	0.005	--	--	--	--	--	--	--	--	--	--
Diethylphthalate	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dimethoate	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Dimethylphthalate	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Di-n-Butylphthalate	ug/L	1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Di-N-octylphthalate	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Endosulfan I (Alpha)	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Endosulfan II (Beta)	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Endosulfan Sulfate	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Endrin (EPA Method 525.2)	ug/L	0.2	2	0.2	--	--	--	--	--	--	--	--	--	--
Endrin Aldehyde	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
EPTC	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Fluoranthene	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Fluorene	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
gamma-Chlordane	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Heptachlor (EPA Method 525.2)	ug/L	0.03	0.4	0.02	--	--	--	--	--	--	--	--	--	--
Heptachlor Epoxide (isomer B)	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	ug/L	0.05	1	N/A	--	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/L	0.05	50	N/A	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3,c,d)Pyrene	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Isophorone	ug/L	0.5	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Lindane	ug/L	0.04	0.2	N/A	--	--	--	--	--	--	--	--	--	--
Malathion	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Methoxychlor (EPA Method 525.2)	ug/L	0.1	40	100	--	--	--	--	--	--	--	--	--	--
Metolachlor	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--

Analyte	Unit	MRL	Drinking Water Std[1]	Ground-water Quality Std[2]	MUNI-107	MUNI-264	MUNI-698	MUNI-703	MUNI-704	MUNI-708	MUNI-234	MUNI-734	MUNI-736	MUNI-9999
					Tumwtr Well #11	Tumwtr #12	Tumwtr Well #4	Tumwtr Well #9	Tumwtr Well #10	Tumwtr Well #15	Wash. Water Summer Hill	Wash. Water Monaco Park	Wash. Water Israel Place	Wash. Water The Cloister
					9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/16/2015	9/16/2015	9/16/2015	9/16/2015
Metribuzin	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Molinate	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Naphthalene (EPA Method 525.2)	ug/L	0.3	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Parathion	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Pendimethalin	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	ug/L	1	1	N/A	--	--	--	--	--	--	--	--	--	--
Permethrin (mixed isomers)	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Phenanthrene	ug/L	0.04	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Propachlor	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Pyrene	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Simazine (EPA Method 525.2)	ug/L	0.05	4	N/A	--	--	--	--	--	--	--	--	--	--
Terbacil	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Terbuthylazine	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Thiobencarb	ug/L	0.2	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Total PAH	ug/L	0.02	N/A	N/A	--	--	--	--	--	--	--	--	--	--
trans-Nonachlor	ug/L	0.05	N/A	N/A	--	--	--	--	--	--	--	--	--	--
Trifluralin	ug/L	0.1	N/A	N/A	--	--	--	--	--	--	--	--	--	--

Notes:

MRL = Minimum Reporting Level; -- = The analyte was not analyzed; N/A = not applicable (e.g., no standard for this parameter); ND = Not Detected above MRL; mg/L = milligrams per liter (ppm); µg/L = micrograms per liter (ppb); ng/L = nanograms per liter (ppt); µS/cm = microsiemens per centimeter; mV = millivolts; MPN/100ml = Most Probable Number (colony forming units) per 100 ml; PFU/100ml = Plaque Forming Units per 100 ml; PFC = Perfluorinated Compound; DBP = Disinfection Byproduct; PCB = Polychlorinated Biphenyl; PBDE = Polybrominated Diphenyl Ether; VOC = Volatile Organic Compound; SVOC = Semivolatile Organic Compound; P = present; A = absent

(1) Established by the Washington State Department of Health in 246-290 WAC. Bacteria drinking water standards are listed in WAC 246-290-310(2)

(2) Established by the Washington State Department of Ecology in WAC 173-200-040

J = Value is detected and the result is estimated

J- = Value is detected and the result is estimated and biased low

UJ = Result is a non-detect and the value is estimated

R = Result rejected

*Drinking water and groundwater quality standards are for total metals.

Appendix F
Laboratory Analytical Reports
(separate file)

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