Modeling Quality Assurance Project Plan for the Willamette River Mainstem and Major Tributaries Temperature Total Maximum Daily Load

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Abbreviations

AWQMS	Ambient Water Quality Monitoring System
BLM	United States Bureau of Land Management
DEQ	Oregon Department of Environmental Quality
DMR	Discharge Monitoring Report
DOE	Washington State Department of Ecology
EMSWCD	East Multnomah Soil & Water Conservation District
EQC	Oregon Environmental Quality Commission
NCDC	National Climatic Data Center
NPDES	National Pollutant Discharge Elimination System
OAR	Oregon Administrative Rule
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
OWRD	Oregon Water Resources Department
PGE	Portland General Electric
PSU	Portland State University
QAPP	Quality Assurance Project Plan
RAWS	Remote Automatic Weather Stations
S&PF	State and Private Forestry
STP	Sewage Treatment Plant
TIR	Thermal Infrared Radiometry
TMDL	Total Maximum Daily Load
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey

WRIS	Water Rights Information System
WWTP	Waste water treatment plant

1 Introduction

This Quality Assurance Project Plan (QAPP) summarizes the modeling approach to be used for the temperature TMDL replacement project applicable in the Willamette River mainstem and major tributaries QAPP project area. The project area is located within the Willamette Basin (HUC 170900) and only includes the following rivers and extents:

- Willamette River including all side channels and sloughs from the confluence of the Columbia River to the confluence of Coast Fork of the Willamette and Middle Fork of the Willamette Rivers (approximately river mile 187);
- Multnomah Channel;
- Clackamas River downstream of River Mill Dam/Estacada Lake (approximately river mile 26);
- Santiam River (all 12 miles);
- North Santiam River downstream of Detroit Dam (approximately river mile 49);
- South Santiam River downstream of Foster Dam (approximately river mile 38);
- Long Tom River downstream of Fern Ridge Dam (approximately river mile 26);
- McKenzie River downstream of the South Fork McKenzie River (approximately river mile 56);
- South Fork McKenzie River downstream of Cougar Dam (approximately river mile 4);
- Blue River downstream of Blue River Dam (approximately river mile 1.9);
- Middle Fork Willamette River downstream of Dexter Dam (approximately river 17);
- Fall Creek downstream of Fall Creek Dam (approximately river mile 7);
- Coast Fork Willamette River downstream of Cottage Grove Dam (approximately river mile 30);
- Row River downstream of Dorena Dam (approximately river mile 7.5).

A TMDL is a water quality restoration plan and the calculation of the maximum amount of a pollutant that a waterbody can receive while still meeting water quality standards for that particular pollutant. The maximum amount of loading a waterbody can receive is called the loading capacity. Loading from all pollutant sources must not exceed the loading capacity (TMDL) of a waterbody, including an appropriate margin of safety.

Load allocations are portions of the loading capacity that are allocated to background sources or non-point sources, such as urban, rural agriculture, or forestry activities. Wasteload allocations are portions of the total load, which are allocated to NPDES permitted sources, such as wastewater treatment plants or industries. Wasteload allocations are used to establish effluent limits in NPDES discharge permits. Allocations may also be reserved for future uses, called reserve capacity. Allocations are quantified measures that assure water quality standards will be met and may distribute the pollutant loads between nonpoint and point sources. This general TMDL concept is represented by Equation 1.

$$TMDL = \sum WLA + \sum LA + Reserve\ Capacity + MOS \qquad \text{Equation 1}$$

Where $\sum WLA$ is the sum of wasteload allocations (NPDES permitted sources), $\sum LA$ is the sum of load allocations (nonpoint sources and background), Reserve Capacity is allocations reserved for future uses, and MOS is a margin-of-safety to account for uncertainty. For a temperature TMDL, these elements establish the maximum thermal loads that a waterbody may receive without exceeding applicable water quality standards for temperature designed to protect aquatic life and other beneficial uses.

The Clean Water Act requires TMDLs be developed for waterbodies that do not meet water quality standards and are listed as water quality impaired on the State's 303(d) list. The Willamette River

mainstem and major tributaries QAPP project area include several waterbodies listed on the Oregon 2018/2020 Section 303(d) Category 5 list as water quality limited for temperature (Table 1). A TMDL was previously developed for the Willamette River mainstem and major tributaries QAPP project area (DEQ, 2006) but it must be replaced due to recent litigation.

In 2013, the United States Environmental Protection Agency (USEPA) disapproved the Natural Conditions Criterion contained in Oregon's water quality standard for temperature due to the 2012 U.S. District Court decision for NWEA v. EPA, 855 F. Supp. 2d 1199 (D. Or., 2012). This portion of the temperature water quality standard was used in most temperature TMDLs issued from 2003 through 2012. On October 4, 2019, the U.S. District Court issued a judgment for NWEA v. EPA, No. 3:12-cv-01751-HZ (D. Or., Oct. 4, 2019) and required DEQ and USEPA to replace 15 Oregon temperature TMDLs that were based on the Natural Conditions Criterion and to reissue the temperature TMDLs based on the remaining elements of the temperature water quality standard.

This QAPP is consistent with DEQ's and USEPA's modeling QAPP guidance (DEQ, 2017; EPA, 2016) and documents the analysis and numerical modeling approach that will support the updated Willamette River Mainstem and Major Tributaries TMDL as well as other project details. In particular, this QAPP details the following:

- Definition of the issue and objectives, including the spatial and temporal extents of the water quality impairments (Section 2);
- A high-level description of the key processes and variables for temperature (Section 3);
- The overarching technical approach, including the appropriate modeling and analytical tools to be used (Section 4);
- The data sources for defining and creating inputs to the model, including data that were used in the modeling for the original TMDL. Examples of these inputs include meteorological data, stream flow and temperature, point sources and vegetation characteristics (Sections 5 and 6);
- How the analysis and modeling will be evaluated for acceptability (Sections 7 and 9);
- Scenarios for evaluating management strategies for reducing anthropogenic thermal loads (Section 10);
- Various aspects for managing the TMDL development project, including documentation (Section 8), the project team (Section 11), data and records management (Sections 12 and 13); and
- Aspects relating to this QAPP and its role in the project (Sections 14 and 15).

2 Problem definition and management objectives

Multiple waterbodies in the Willamette River mainstem and major tributaries QAPP project area do not meet the water quality standards for temperature and are listed as Category 5, water quality limited on Oregon's 2018/2020 Section 303(d) list (Table 1). The temperature water quality standards are set at a level to protect the most sensitive beneficial uses. The beneficial uses most sensitive to water temperature

are fish and aquatic life. The temperature water quality standards in the Willamette River mainstem and major tributaries QAPP project area include the numeric and narrative criteria identified below. The numeric temperature criteria are based on a seven-day average daily maximum continuous measurement of temperature.

- Salmon and Steelhead Spawning: 13.0 deg-C (OAR 340-041-0028(4)(a))
- Core Cold Water Habitat: 16.0 deg-C (OAR 340-041-0028(4)(b))
- Salmon and Trout Rearing and Migration: 18.0 deg-C (OAR 340-041-0028(4)(c))
- Salmon and Steelhead Migration Corridors: 20.0 deg-C (OAR 340-041-0028(4)(d))
- Cool Water Species narrative: No increase in temperature is allowed that would reasonably be expected to impair cool water species (OAR 340-041-0028(9))

Where and when the applicable criteria apply are based on the designated fish uses maps in OAR 340-041-0340 Figure 340A and Figure 340B. The fish use designations and applicable criteria are shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

The numeric portions of the temperature standard authorizes insignificant additions of heat from human sources in waters that exceed the applicable temperature criteria as follows: Following a temperature TMDL or other cumulative effects analysis, the Human Use Allowance (HUA) will restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.3 deg-C (OAR 340-041-0028(12)(b)).

As described in Chapter 1, the U.S. Environmental Protection Agency (USEPA) and State of Oregon (OR) are required to revise the water temperature TMDL for the Willamette River mainstem and major tributaries QAPP project area. In revising the TMDL, all of the allocations will be updated to target the applicable biologically-based numeric criteria (BBNC) and Human Use Allowance (HUA) water quality temperature standards.

Since the issuance of the original TMDL, the extent and number of waterbodies that are identified as water quality limited for temperature has changed. As part of the TMDL update, DEQ will address all current temperature listings based on the most recent integrated report list. The current listings, as they pertain to the Willamette River mainstem and major tributaries QAPP project area, were obtained from Oregon's 2018/2020 Integrated Report and are summarized in Table 1. The listings are also shown in the HTML interactive map that accompanies this QAPP and referenced in Appendix E.

To the extent existing data and information allow, the primary analysis and modeling objectives for this TMDL include:

1) Complete a source assessment and cumulative effects analysis to characterize or identify:
    a. Anthropogenic sources of stream temperature warming;
    b. How much warming comes from background sources;
    c. How much warming comes from each anthropogenic source or source category;
    d. The cumulative warming from all anthropogenic sources combined;
    e. Where along the stream anthropogenic warming occurs;
    f. Where the point of maximum stream warming is located; and

g. The amount of stream warming that exceeds the human use allowance and applicable water quality standards.

2) Determine TMDL elements and allocations that attain the applicable temperature criteria by identifying:

a. The thermal loading capacity for each temperature listed waterbody;
b. The excess thermal load exceeding the loading capacity for each temperature listed waterbody;
c. The thermal load and wasteload allocations necessary to meet the applicable water quality standards for each listed waterbody;
d. Any surrogate measures;
e. Any reserve capacity;
f. Any margin of safety; and
g. The seasonal variation and critical conditions corresponding to the time period when the applicable temperature criteria are exceeded.

3) Support development of the TMDL Water Quality Management Plan and evaluate implementation options.

a. Evaluate existing land management plans, TMDL implementation plans, or rules for sufficiency in minimizing anthropogenic warming to the level established by the TMDL allocations.
b. Identify additional management strategies or surrogate measures.
c. Identify under what timeline and where management strategies need to be implemented.

The effort currently described in the QAPP includes use of existing models and the development of new models or new model scenarios.

Table 1: Willamette River mainstem and major tributaries assessment units that are classified as water quality limited category 5 for temperature based on the Section 303(d) 2018/2020 Integrated Report.

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Clackamas River	OR_SR_1709001106_02_104597	2010	Year Round
Clackamas River	OR_SR_1709001106_02_104597	2018	Spawning
Coast Fork Willamette River	OR_SR_1709000204_02_103787	2010	Year Round
Coast Fork Willamette River	OR_SR_1709000203_02_104585	2018	Year Round
Fall Creek	OR_SR_1709000109_02_103735	2010	Year Round
Fall Creek	OR_SR_1709000109_02_103735	2018	Spawning
Long Tom River	OR_SR_1709000301_02_103791	2010	Year Round
Lower Blue River	OR_SR_1709000404_02_104569	2018	Spawning, Year Round
McKenzie River	OR_SR_1709000405_02_103866	2010	Spawning, Year Round

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
McKenzie River	OR_SR_1709000407_02_103884	2010	Spawning, Year Round
Middle Fork Willamette River	OR_SR_1709000107_02_104583	2018	Spawning, Year Round
Middle Fork Willamette River	OR_SR_1709000110_02_104584	2018	Spawning, Year Round
Multnomah Channel	OR_SR_1709001203_88_104184	2010	Year Round
North Santiam River	OR_SR_1709000504_02_103906	2010	Spawning, Year Round
North Santiam River	OR_SR_1709000506_02_103930	2010	Spawning, Year Round
Row River	OR_SR_1709000202_02_103779	2010	Year Round
Row River	OR_SR_1709000202_02_103779	2018	Spawning
Santiam River	OR_SR_1709000506_02_103927	2010	Spawning, Year Round
South Fork McKenzie River	OR_SR_1709000403_02_104590	2010	Spawning
South Fork McKenzie River	OR_SR_1709000403_02_104590	2018	Year Round
South Santiam River	OR_SR_1709000608_02_103925	2010	Spawning, Year Round
Willamette River	OR_SR_1709000306_05_103854	2010	Spawning, Year Round
Willamette River	OR_SR_1709000701_05_104005	2010	Spawning, Year Round
Willamette River	OR_SR_1709000703_04_104013	2010	Year Round
Willamette River	OR_SR_1709000703_88_104015	2010	Year Round
Willamette River	OR_SR_1709000704_88_104020	2010	Year Round
Willamette River	OR_SR_1709001201_88_104019	2010	Year Round
Willamette River	OR_SR_1709001202_88_104175	2010	Year Round
Willamette River	OR_SR_1709000703_04_104013	2018	Spawning
Willamette Slough	OR_LK_1709000703_02_100792	2010	Year Round

3 Conceptual model: key processes and variables

The current theory to explain the nature of heat is called the kinetic-molecular theory. The modern version of this theory was developed in the mid-19th century by Rudolf Clausis, James Clerk Maxwell,

and Ludwig Boltzmann. The theory is based on the assumption that all matter is composed of a tiny population of molecules that are always in motion. The molecules in hot objects are moving faster and hence have greater kinetic energy than the molecules in cold objects. Individual molecules have a certain amount of kinetic energy based on their mass and velocity. The thermal energy of an object is determined by adding up the kinetic energy of all the molecules in that object. When a hot and cold object come into contact with each other, the molecules collide and the kinetic energy flows from the molecules with more kinetic energy to molecules with less kinetic energy. This type of flow of kinetic energy is called heat.

Temperature is an intensive property and much like concentration measures the "strength" rather than "quantity" of kinetic energy. The temperature of an object is the measure of the average kinetic energy of all the molecules in that object. Hot water has greater average kinetic energy than cold water but may not have greater total kinetic energy. For example, a small pot of water with a temperature near the boiling point has a higher average kinetic energy than a swimming pool at room temperature. The swimming pool has a much larger quantity of molecules and therefore a higher total kinetic energy than the pot of water.

Temperature is the water quality parameter of concern, but heat, in particular heat from human activities or anthropogenic sources, is the pollutant of concern. Water temperature change (ΔTw) is a function of the heat transfer in a discrete volume and may be described in terms of changes in heat per unit volume. Conversely, a change in volume can result in water temperature change for a defined amount of heat exchange. With this basic conceptual framework of water temperature change, it is possible to discuss stream temperature change as a function of two variables: heat and mass transfer.

Water Temperature Change as a Function of Heat Exchange and Volume,

$$\Delta Tw = \frac{\Delta Heat}{Density \times Specific\ Heat \times \Delta Volume} \qquad \text{Equation 2}$$

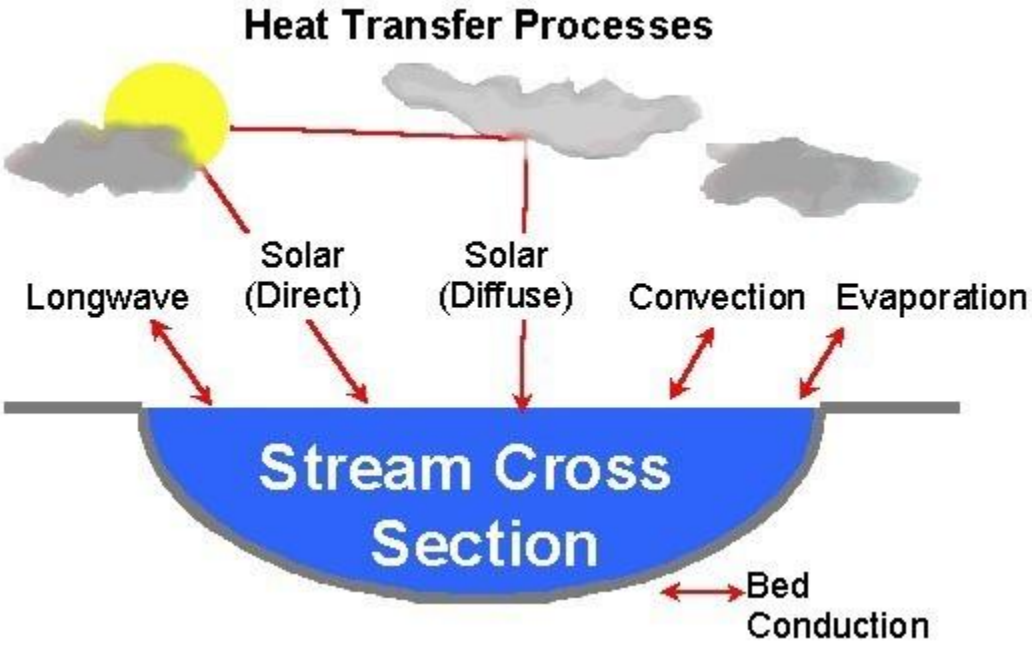

Figure 1: Major heat transfer processes.

Heat transfer relates to processes that change heat in a defined water volume. There are several thermodynamic pathways that can introduce or remove heat from a stream. These different processes are shown in Figure 1. For any given stream reach heat exchange is closely related to the season, time of day and the surrounding environment and the stream characteristics. Heat transfer can be dynamic and change over relatively small distances and time periods. Equation 3 describes the several heat transfer processes that change stream temperature (Wunderlich, 1972; Jobson and Keefer, 1979; Beschta and Weatherred, 1984; Sinokrot and Stefan, 1993; Boyd, 1996; Johnson, 2004; Hannah et al., 2008; Benyahya et al., 2012).

$$\Phi_{total} = \Phi_{solar} + \Phi_{longwave} + \Phi_{streambed} + \Phi_{convection} + \Phi_{evaporation} \qquad \text{Equation 3}$$

Where,
Φ_{total} = Net heat energy flux (+/-)
Φ_{solar} = Shortwave direct and diffuse solar radiation (+ only)
$\Phi_{longwave}$ = Longwave (thermal) radiation (+/-)
$\Phi_{streambed}$ = Streambed conduction (+/-)
$\Phi_{convection}$ = Stream/air convection[1] (+/-)
$\Phi_{evaporation}$ = Evaporation (+/-)

[1]Air/Water convection includes both turbulent and free surface conduction.

Mass transfer relates to transport of flow volume downstream, instream mixing and the introduction or removal of water from a stream. For instance, flow from a tributary will cause a temperature change if the temperature is different from the receiving water. Mass transfer commonly occurs in stream systems as a result of:

- Advection,
- Dispersion,
- Groundwater exchange,
- Hyporheic flows,
- Surface water exchange (e.g., tributary input, precipitation), and
- Other human related activities that alter stream flow volume.

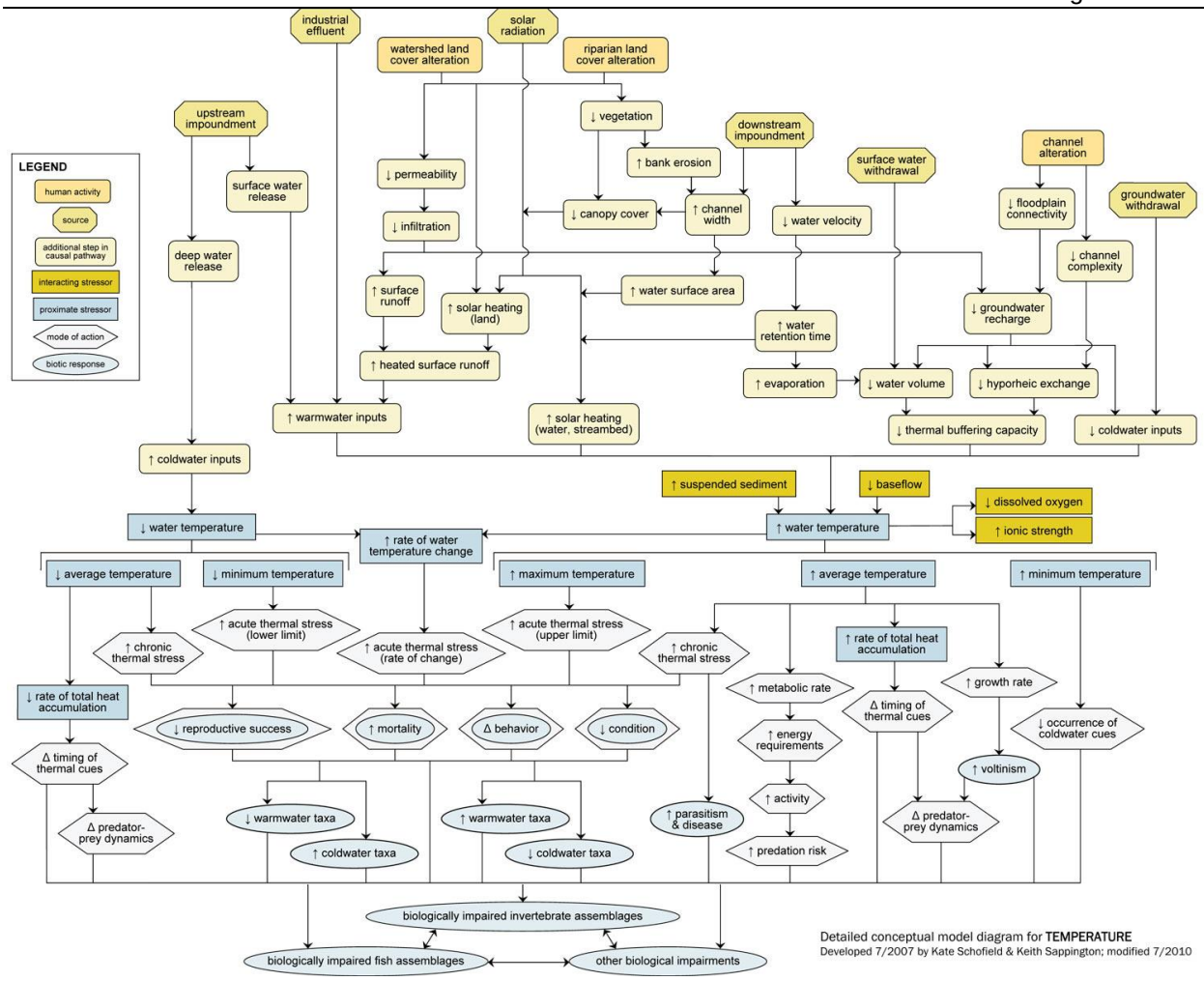

Figure 2: Conceptual diagram that identifies the key processes and variables that drive stream temperature changes and the biological responses (Schofield and Sappington, 2010).

Stream temperature is influenced by both human and natural factors. Figure 2 is a conceptual diagram that identifies the key process and variables that drive stream temperature. Human sources and natural sources are identified. Near the bottom of the diagram the biological responses are identified.

Anthropogenic Nonpoint Sources: Temperature increases from human-caused nonpoint sources are caused by increases in solar radiation loading to the stream network from the disturbance or removal of near-stream vegetation, channel modification and widening, reductions to the stream flow rate or volume, changes in hyporheic flows and channel connectivity, reductions in cold groundwater inflows, and changes to meteorological conditions, such as those caused by climate change.

Background Sources: Background sources include all sources of pollution or pollutants not originating from human activities. In the context of a TMDL, background sources may also include anthropogenic sources of a pollutant that DEQ or another Oregon state agency does not have authority to regulate, such as pollutants emanating from another state, tribal lands, or sources otherwise beyond the jurisdiction of the state (OAR 340-042-0030(1)). Additionally, effective shade levels on smaller streams are more sensitive to riparian disturbances and so the differences between current condition solar flux and background solar flux can be larger.

Anthropogenic Point Sources: Temperature increases from point sources are those caused by warm water discharges from NPDES permitted facilities, such as industrial outfalls, municipal waste water treatment plants (WWTP), and other point sources.

4 Technical approach

4.1 Overview

An important step in the TMDL is to perform a source assessment which quantifies the background and anthropogenic contributions to stream heating. Models provide a way to evaluate potential sources of stream warming and, to the extent existing data allow, the amount of pollutant loading from these sources. The model that is selected for the TMDL analysis should support the needs of the project. Section 4.2 describes the model framework needs for this project and the models that will be used to support the TMDL.

TMDLs also require identification of seasonal variation and critical conditions. The TMDL analysis will determine seasonal variation by including a statistical summary and visual plots summarizing the instream temperatures and flow rates observed at various monitoring locations. The time period when the applicable temperature criteria are exceeded will be described in relation to the critical conditions.

The TMDL will establish a loading capacity which specifies the amount of a pollutant or pollutants that a waterbody can receive and still meet water quality standards. The pollutant addressed in the temperature TMDL is heat. The TMDL will divide the loading capacity into thermal wasteload allocations for NPDES permittees and load allocations for background and nonpoint sources of heat to ensure that the applicable temperature standards are achieved. Anthropogenic nonpoint and NPDES permitted point sources are not permitted to heat a waterbody more than 0.3 deg-C above the applicable numeric criteria, cumulatively at the point of maximum impact. The portion of the human use allowance allocated to each source will be determined in the TMDL with the modeling approach supporting assessment of different allocation options. The modeling approach may also be used to support development of TMDL surrogate measures such as effective shade targets. Nonpoint source allocations can be translated into surrogate measures when a pollutant is difficult to measure, highly variable, or difficult to monitor (OAR 340-042-0040(5)(b)). Thermal load allocations for nonpoint sources can be difficult to measure and monitor. Attainment of the surrogate measures ensures compliance with the nonpoint source allocations.

In the Long Tom River where the narrative cool water species criterion applies, all sources cannot result in a temperature that would reasonably be expected to impair cool water species. As part of the TMDL analysis, DEQ may review available studies and consult with fishery experts to determine the most sensitive cool water species and the temperature tolerances of that species.

Stream temperatures for all rivers in the project area will be simulated using CE-QUAL-W2 version 4 temperature model. Site-specific load allocations will be developed for the streams that are simulated. Numeric or narrative wasteload allocations will be developed for all NPDES permittees.

4.2 Model selection

The modeling framework needs for this project include:

1) Prediction of hourly stream temperatures over the summer and spawning use transition period in the fall (approximately May 1 - October 30) in order to evaluate the critical period when stream temperatures most often exceed the applicable temperature criteria.

2) Prediction of hourly stream temperatures during low flow periods.

3) Ability to evaluate hourly stream temperature response from changes in effluent temperature and effluent flow discharge from NPDES permitted facilities.

4) Ability to evaluate hourly stream temperature response from changes in flow and stream temperature at boundary condition tributaries and Dams/Reservoir operations.

5) Ability to model stream temperature and hydrodynamics in stratified, tidal, and well mixed riverine waterbodies.

CE-QUAL-W2 model version 3.12 was used to model all the project area rivers (except Blue River) for the development of the 2006 Willamette Basin TMDL. The models were calibrated using data collected during model years 2001 and 2002. These set of CE-QUAL-W2 models were developed for the temperature TMDL by Portland State University (PSU) (Annear et al., 2004; Berger et al., 2004), the USGS (Sullivan and Rounds, 2004), and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007) and used them to estimate the thermal effects of dams in the Willamette River Basin (Rounds, 2010).

Since then, the USGS and U.S. Army Corps of Engineers have collaborated to update some of the CE-QUAL-W2 models for the U.S. Army Corps of Engineers' Willamette Valley Project environmental impact statement. The models for the Coast Fork Willamette River, Middle Fork Willamette River, McKenzie River, South Santiam River, North Santiam River, Santiam River, and the Willamette River upstream of Willamette Falls were updated from version 3.12 to CE-QUAL-W2 version 4.2. The updated models are being used to simulate water temperatures from approximately April to November of 2011, 2015, and 2016. Because these series of CE-QUAL-W2 models already exist and meet all the model framework needs, CE-QUAL-W2 was selected for stream temperature simulation in the project area. The TMDL model analysis will focus efforts on the 2015 calibration year because this model year provides an opportunity to evaluate allocations during critical 7Q10 low flow conditions. Of the three model years, model year 2015 had the most days with flow rates at or below 7Q10. 2011 had no days with flow rates at or below 7Q10 and 2016 had fewer days than 2015.

CE-QUAL-W2 version 4.2 is a two-dimensional, longitudinal/vertical, hydrodynamic and water quality model (Wells, 2019). The model was originally developed by the U.S. Army Corps of Engineers and is currently maintained by Portland State University. The model consists of directly coupled hydrodynamic and water quality transport algorithms. Developed for reservoirs and narrow, stratified estuaries, CE-QUAL-W2 can handle a branched and/or looped system with flow and/or head boundary conditions. CE-QUAL-W2 simulates water surface elevations, velocities (longitudinal and vertical), temperature, and multiple other water quality constituents including phytoplankton, dissolved oxygen, pH, organic matter, and nutrients.

4.3 Software Development Quality Assessment

We do not anticipate any new software development or model code changes as part of this project.

5 Data availability and quality

This chapter describes the data that is available to support the TMDL project and the quality assurance procedures used when collecting or reviewing the available data.

5.1 Meteorology

Meteorological data includes air temperature, sky conditions, cloudiness, relative humidity, and wind speed. Table 46 through Table 49 in Appendix A list the stations where meteorological data available in the Willamette River mainstem and major tributaries QAPP project area, including 355 stations from National Oceanic and Atmospheric Association (NOAA)'s National Climatic Data Center (NCDC), 1 station from National Interagency Fire Center's Remote Automatic Weather Stations (RAWS), 3 stations from Bureau of Reclamation Cooperative Agricultural Weather Network (AgriMet), and 388 stations from University of Utah MesoWest database. The meteorological monitoring stations are also shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E. The station IDs in Table 46 are the NCDC IDs, which may differ from the station identifiers used by other sources.

The meteorological data obtained from the NCDC includes the Local Climatological Dataset (NOAA, 2005) and the Global Integrated Surface Dataset (NOAA, 2001). The Local Climatological Dataset includes quality controlled meteorological data from airports and other prominent weather stations managed by the National Weather Service, Federal Aviation Administration, and the U.S. Department of Defense. The Global Integrated Surface Dataset provides a long-term record of hourly, sub-hourly and synoptic weather observations from a variety of meteorological networks around the world. The dataset includes observations from the World Meteorological Organization, Automated Surface Observing System, Automated Weather Observing Stations, U.S. Climate Reference Network, and others.

5.2 Thermal Infrared Radiometry (TIR) data

DEQ contracted with Watershed Sciences, Inc. to provide airborne Thermal Infrared Radiometry (TIR) imagery of spatial temperature patterns within the Willamette River mainstem and major tributaries QAPP project area (Torgersen et al., 1999, Watershed Sciences, 2003). TIR data is used to characterize the thermal regime of the streams and habitat quality. All streams and the TIR collection dates are summarized in Table 2.

Table 2: Streams and the TIR collection dates in the Willamette River mainstem and major tributaries QAPP project area.

Stream	Survey Extent	Date	Time	Survey Distance
Coast Fork Willamette River	Cottage Grove Lake to Big River	2002-07-21	16:14-16:27	7.6 mi
Coast Fork Willamette River	Mouth to Cottage Grove Lake	2002-07-22	13:51-14:27	28.7 mi
McKenzie River	Quartz Creek to Trail Bridge Reservoir	1999-09-03	16:23 – 16:30	45.5 km
Middle Fork Willamette River	Mouth at Willamette River to Dexter Lake	2002-07-22	15:20-15:34	15.9 mi

Stream	Survey Extent	Date	Time	Survey Distance
Willamette River	Independence, OR to Middle Fork Willamette River	2002-07-22	15:34-16:45	86.9 mi

5.3 Continuous stream temperature data

All available continuous stream temperature data were retrieved from DEQ's Ambient Water Quality Monitoring System (AWQMS), USGS's National Water Information System (NWIS), or were obtained during the data solicitation for DEQ's Temperature TMDL Replacement Project. Some temperature data presented in this QAPP were retrieved from DEQ's files and were not available in AWQMS or USGS's database.

The data retrieval period for continuous stream temperature data is from January 1, 1990 to December 31, 2020. Data retrieved from the AWQMS database has a Data Quality Level (DQL) of A, B or E and a result status of "Final" or "Provisional". The data quality level criteria are outlined in DEQ's Data Quality Matrix for Field Parameters (DEQ, 2013). The TMDL program uses waterbody results with a data quality level of A, B, or E (DEQ, 2021). Data of unknown quality are used after careful review.

Appendix B summarizes 434 locations where continuous stream temperature data were collected in the Willamette River mainstem and major tributaries QAPP project area and the organizations that collected that data in Table 50, and when data were collected at each location in Table 51. The location of these stations is shown in the HTML interactive map that accompanies this QAPP and referenced in Appendix E.

5.4 Stream flow data

Table 52 through Table 53 in Appendix C list the stations where continuous and instantaneous flow volume data were available in the Willamette River mainstem and major tributaries, including 55 stations from USGS and 1 station from DEQ's files. Table 54 lists the years that continuous stream flow data were collected at each location. The location of these stations is shown in the HTML interactive map that accompanies this QAPP and referenced in Appendix E. DEQ relies upon the quality control checks implemented by USGS and OWRD. DEQ-collected stream flow measurements utilize field and quality control methods outlined in DEQ's Mode of Operations Manual (DEQ, 2020).

5.5 Gage Height

Table 3 lists the stations for gage height data that were available in USGS databases. Table 55 in Appendix D lists the years that gage height data were collected at each location. The location of these stations is shown in the HTML interactive map that accompanies this QAPP and referenced in Appendix E.

Table 3: Gage height data available from the USGS monitoring stations in the Willamette River mainstem and major tributaries QAPP project area.

Station ID	Station	Latitude/Longitude
14128870	Columbia River below Bonneville Dam, OR	45.63306/-121.9608
14149010	Lookout Point Dam Tailwater Near Lowell, OR	43.91537/-122.7536

Station ID	Station	Latitude/Longitude
14149510	Dexter Dam Tailwater at Dexter, OR	43.92434/-122.8056
14158050	Willamette River at Eugene, OR	44.0525/-123.0828
14159110	Mckenzie River above South Fork, Near Rainbow, OR	44.16638/-122.2565
14159410	Cougar Dam Tailwater Near Rainbow, OR	44.13055/-122.2436
14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	44.07067/-122.8847
14180510	Detroit Dam Tailwater Near Detroit, OR	44.722/-122.251
14181410	Big Cliff Dam Tailwater Near Niagara, OR	44.75149/-122.2834
14186110	Green Peter Dam Tailwater Near Foster, OR	44.44929/-122.5497
14186200	Middle Santiam River below Green Peter Dam near Foster, OR	44.44818/-122.5504
14186610	Foster Dam Tailwater at Foster, OR	44.41479/-122.6714
14207740	Willamette River above Falls, at Oregon City, OR	45.34845/-122.6201
14207770	Willamette River below Falls, at Oregon City, OR	45.35762/-122.6109
14211720	Willamette River at Portland, OR	45.5175/-122.6692
444650123134500	Luckiamute River Near Parker, OR	44.78051/-123.2292
14128600	Columbia River at Stevenson, WA	45.69928/-121.8684
14128895	Hamilton Creek Near Mouth, at N Bonneville, WA	45.63631/-121.9825
14144700	Columbia River at Vancouver, WA	45.62067/-122.6734
14220500	Lewis River at Ariel, WA	45.95178/-122.564

5.6 Point source discharges

Table 4 identifies all the active individual NPDES permittees in the Willamette River mainstem and major tributaries QAPP project area (including individual MS4 permittees). Table 5 lists the registrants covered under the general NPDES GEN01, GEN03, GEN05, and GEN40 (MS4) permits in the Willamette River mainstem and major tributaries QAPP project area. This group of general permits are highlighted because the permits require temperature monitoring at a frequency of at least one grab sample per month. The location of these NPDES permittees is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E. Many of these permittees submit Discharge Monitoring Reports (DMRs) as a condition of their permit. Depending on the monitoring requirements in the permit, some permittees are required to report effluent temperature and effluent flow rates in the DMR. The frequency and type of reporting varies by permit and permit type. Some permits only require monthly, weekly, or daily grab samples while others require summary statistics such as daily maximum, daily mean, or seven-day average daily maximum. Where possible, DEQ will utilize any continuous effluent data that has been provided to DEQ. When continuous data is not available, DMR data will be utilized to characterize point source discharges. Table 6 lists the current number of registrants for all the other general NPDES permits in the Willamette River mainstem and major tributaries QAPP project area that are not listed in Table 5.

Table 4: Summary of individual NPDES permitted discharges in the Willamette River mainstem and major tributaries QAPP project area.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
Adair Village STP (500)	44.6725/-123.214	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 122
Am WRF (1098)	44.643/-123.077	NPDES-DOM-Ba: Sewage - 5 MGD or more but less than 10 MGD	Willamette River RM 118
Arkema (68471)	45.5713/-122.745	NPDES-IW-B14: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 1 sources	Willamette River RM 7.2
Arkema (68471)	45.5713/-122.745	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 7.4
Ash Grove Cement - Rivergate Lime Plant (3690)	45.6229/-122.784	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 3.3
BDC/Willamette LLC (109444)	45.479/-122.673	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 15.8
Blue Heron Paper Co. (72634)	45.3562/-122.61	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 27.8
Brooks Sewage Treatment Plant (100077)	45.044/-122.965	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 71.7
Canby Regency Mobile Home Park (97612)	45.2924/-122.652	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 31.6
Canby STP (13691)	45.2886/-122.681	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 33
Cascade Pacific Pulp, LLC (36335)	44.3827/-123.16	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 147.7
Century Meadows Sanitary System (Cmss) (96010)	45.2656/-122.825	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 42.8
Corvallis STP (20151)	44.5758/-123.255	NPDES-DOM-Ba: Sewage - 5 MGD or more but less than 10 MGD	Willamette River RM 130.8

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
Cottage Grove Lumber (96188)	43.7659/-123.078	NPDES-IW-B19: Timber and Wood Products - Sawmills, log storage, instream log storage.	Coast Fork Willamette River RM 24.2
Cottage Grove STP (20306)	43.8077/-123.048	NPDES-DOM-C2a: Sewage - 1 MGD or more but less than 2 MGD	Coast Fork Willamette River RM 20.6
Covanta Marion, Inc (89638)	45.0493/-122.964	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 72
Dundee STP (25567)	45.281/-123.013	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 51.7
Eugene, City Of, Municipal Stormwater MS4 (107989)	44.0614/-123.189	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Multiple discharge locations
Evraz Oregon Steel (64905)	45.6256/-122.779	NPDES-IW-B08: Primary smelting and/or refining - Ferrous and non-ferrous metals not elsewhere classified	Willamette River RM 2.4
Forest Park Mobile Village (30554)	45.3382/-122.641	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 28.2
Frank Lumber Co. Inc. (30904)	44.7491/-122.504	NPDES-IW-B19: Timber and Wood Products - Sawmills, log storage, instream log storage.	North Santiam River RM 32.5
Gresham, City Of - Municipal Stormwater MS4 (108013)	45.5164/-122.535	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Multiple discharge locations
H&V - Corvallis (28476)	44.5538/-123.261	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 132.5
Halsey Mill (105814)	44.4034/-123.194	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 147.7
Harrisburg Lagoon Treatment Plant (105415)	44.2902/-123.183	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 158.4
Independence STP (41513)	44.8583/-123.196	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 95.5
IP Springfield Paper Mill (96244)	44.0539/-122.959	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	McKenzie River RM 14.7

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
Jasper Wood Products, LLC (100097)	43.9791/-122.879	NPDES-IW-B21: Timber and Wood Products - Wood preserving	Middle Fork Willamette River RM 9
Jefferson STP (43129)	44.724/-123.01	NPDES-DOM-Da: Sewage - less than 1 MGD	Santiam River RM 9.2
Lebanon WWTP (49764)	44.5488/-122.896	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	South Santiam River RM 17.4
Lowell STP (51447)	43.9152/-122.783	NPDES-DOM-Da: Sewage - less than 1 MGD	Middle Fork Willamette River RM 15.7
Monmouth STP (57871)	44.8583/-123.217	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 95.5
Monroe STP (57951)	44.315/-123.293	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Long Tom River RM 6.9
Multnomah County MS4 (120542)	45.54/-122.41	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Multiple discharge locations
MWMC - Eugene/Springfield STP (55999)	44.0961/-123.12	NPDES-DOM-A2: Sewage - 25 MGD or more but less than 50 MGD	Willamette River RM 178
Newberg - Wynooski Road STP (102894)	45.2864/-122.953	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 49.7
NW Natural Gas Site Remediation (120589)	45.5791/-122.757	NPDES-IW-B14: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 1 sources	Willamette River RM 6.4
Oak Lodge Water Services Water Reclamation Facility (62795)	45.4241/-122.652	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 20.1
ODFW - Clackamas River Hatchery (64442)	45.2959/-122.362	NPDES-IW-B17: Dairies, fish hatcheries and other confined feeding operations on individual permits	Clackamas River RM 22.6
ODFW - Leaburg Hatchery (64490)	44.1203/-122.609	NPDES-IW-B17: Dairies, fish hatcheries and other confined feeding operations on individual permits	McKenzie River RM 33.7

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
ODFW - Mckenzie River Hatchery (64500)	44.1166/-122.636	NPDES-IW-B17: Dairies, fish hatcheries and other confined feeding operations on individual permits	McKenzie River RM 31.5
ODOT - Statewide Stormwater MS4 (110870)	44.89/-122.92	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Multiple discharge locations
OHSU Center For Health And Healing (113611)	45.4994/-122.671	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 14.5
OSU John L. Fryer Aquatic Animal Health Lab (103919)	44.5676/-123.245	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 130.6
Portland, City Of - Municipal Stormwater MS4 (108015)	45.5506/-122.62	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Multiple discharge locations
Salem Willow Lake STP (78140)	45.0097/-123.055	NPDES-DOM-A2: Sewage - 25 MGD or more but less than 50 MGD	Willamette River RM 78.4
Salem, City Of, Municipal Stormwater MS4 (108919)	44.9228/-122.983	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Multiple discharge locations
Scappoose STP (78980)	45.7526/-122.856	NPDES-DOM-Da: Sewage - less than 1 MGD	Multnomah Channel RM 10.6
Siltronic Corporation (93450)	45.5775/-122.755	NPDES-IW-B14: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 1 sources	Willamette River RM 6.6
SLLI (74995)	45.5665/-122.747	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 7
Springfield Municipal Stormwater, MS4 (84048)	44.0475/-123.018	NPDES-DOM-MS4-2: Municipal Separate Storm Sewer System - Phase II	Multiple discharge locations
Stayton STP (84781)	44.7914/-122.804	NPDES-DOM-C2a: Sewage - 1 MGD or more but less than 2 MGD	North Santiam River RM 14.9

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
Sweet Home STP (86840)	44.4/-122.736	NPDES-DOM-C2a: Sewage - 1 MGD or more but less than 2 MGD	South Santiam River RM 31.5
Tryon Creek WWTP (70735)	45.4213/-122.658	NPDES-DOM-Ba: Sewage - 5 MGD or more but less than 10 MGD	Willamette River RM 20.3
Univar USA Inc (100517)	45.5486/-122.723	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 9
Vigor Industrial (70596)	45.5625/-122.716	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 8.2
WES (Kellogg Creek WWTP) (16590)	45.4398/-122.642	NPDES-DOM-A3: Sewage - 10 MGD or more but less than 25 MGD	Willamette River RM 18.5
WES (Tri-City WPCP) (89700)	45.3759/-122.589	NPDES-DOM-A3: Sewage - 10 MGD or more but less than 25 MGD	Willamette River RM 25.5
West Linn Paper Company (21489)	45.3564/-122.615	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 27.5
Westrock, Newberg Mill (72615)	45.2891/-122.961	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 49.7
Wilsonville STP (97952)	45.2949/-122.772	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 38.5

Table 5: Summary of current registrants under the general NPDES GEN01, GEN03, GEN05, and GEN40 (MS4) permits in the Willamette River mainstem and major tributaries QAPP project area.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
ALBERS MILL BUILDING PARTNERSHIP (ABN) (104545)	45.5292/-122.673	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 12
CERTAINTEED CORPORATION (8550)	45.568/-122.743	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 7
HEWLETT-PACKARD - CORVALLIS (38385)	44.5855/-123.243	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 131

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
HEXION INC (106458)	45.606/-122.764	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 5
HEXION INC. (10125)	44.0428/-123.024	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 184.9
ISOVOLTA INC. (82095)	44.2743/-123.168	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 161.1
LANE COUNTY MUNICIPAL STORMWATER, MS4 (113606)	44.0978/-123.094	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
LINN COUNTY MUNICIPAL STORMWATER MS4 (126417)	44.6343/-123.107	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
LINNTON ASPHALT FACILITY (65589)	45.6061/-122.789	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 4
LINNTON ASPHALT FACILITY (65589)	45.6061/-122.789	GEN05: Industrial Wastewater; NPDES boiler blowdown	Willamette River RM 4
MCCALL MARINE TERMINAL (54175)	45.5635/-122.736	GEN05: Industrial Wastewater; NPDES boiler blowdown	Willamette River RM 7.8
NORTHWEST NATURAL GAS COMPANY (LNG PLANT) (62231)	45.5788/-122.758	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 6.4
ODFW - SOUTH SANTIAM HATCHERY (64560)	44.4163/-122.671	GEN03: Industrial Wastewater; NPDES fish hatcheries	South Santiam River RM 35.5
OFD FOODS, LLC, PLANT 2 AND 3 (107264)	44.6167/-123.106	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 116
PACIFIC CAST TECHNOLOGIES, INC. (102789)	44.6232/-123.102	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 119
RAINSWEET INC. (962)	44.9562/-123.013	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 83
RAINSWEET, INC. (108451)	44.9452/-123.053	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 78.2

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
SOLENIS LLC (38192)	45.5473/-122.709	GEN01: Industrial Wastewater; NPDES cooling water	Willamette River RM 12

Table 6: Summary of the current number of registrants for all the other general NPDES permits in the Willamette River mainstem and major tributaries QAPP project area that are not listed in Table 5.

Permit Type and Description	Current Number of Registrants
GEN02: Industrial Wastewater; NPDES filter backwash	5
GEN12A: Stormwater; NPDES sand & gravel mining	14
GEN12C(AGENT): Stormwater; NPDES construction more than 1 acre disturbed ground, issued by agent	6
GEN12C: Stormwater; NPDES construction more than 1 acre disturbed ground	95
GEN12CA: Stormwater; NPDES government agency construction, more than 1 acre disturbed ground	3
GEN12Z: Stormwater; NPDES specific SIC codes	139
GEN15A: Industrial Wastewater; NPDES petroleum hydrocarbon cleanup	4
GEN17A: Industrial Wastewater; NPDES wash water	2

5.7 Water rights/surface water diversions

Data on surface water diversion rates (usage) and the points of diversion (location) are available from the Oregon Water Resources Department (OWRD). OWRD regulates all commercial, industrial, domestic, and agricultural water use in the state of Oregon through water rights.

Estimates of water diversion rates and location of points of diversion can be derived from the following OWRD sources:

- Water Rights Information System (WRIS) – the WRIS database contains all permitted or certificated water rights. Data in the WRIS corresponding to quantities of water for use are expressed as maximum use allowable, generally as monthly, seasonal or annual rates or volumes. These maximum values may not correspond to actual usage, which will likely vary based on factors such as irrigation application rate or household consumer demand. DEQ may choose to incorporate the maximum amount allowable or some lesser quantity provided sufficient information is available to support those rates in the modeling. Water rights information can also be accessed using their online mapping application (https://apps.wrd.state.or.us/apps/gis/wr/Default.aspx).
- Water Use Reports – some, but not all, water rights holders must monitor and report the water they use to the state, typically on a monthly or yearly basis, as a requirement of their water rights. These water use reports will be used to develop withdrawal time series based on available information.

6 Model development and calibration

The setup and calibration for the models listed in Table 7 will be developed by USEPA's contractor Tetra Tech and USGS. Adjustments to the existing calibrated models are unlikely to occur as part of this project. However, if it is determined that the model calibration needs to be updated, the model inputs that are expected to be modified are described in Section 6.1. DEQ will follow the model acceptance criteria and model fit statistics described in Chapter 7.2.

Table 7: Waterbodies for which new models are expected to be developed.

Model Version	Model Waterbody
CE-QUAL-W2 version 4 temperature model	Clackamas River, Coast Fork and Middle Fork Willamette River, Long Tom River, McKenzie River: Lower, North Santiam and Santiam River, South Santiam River, Willamette River: Lower, Willamette River: Middle, Willamette River: Upper

DEQ will develop effective shade curves for all other waterbodies that were not specifically listed in Table 7. Effective shade curves represent the maximum possible effective shade for different vegetation types, stream widths, and stream aspect. Every combination of these conditions are modeled in Heat Source to develop the estimated effective shade. The results are summarized in a shade curve plot. The results can also be summarized in a lookup table with additional combinations of vegetation height, density, and buffer width included. Effective shade curves were developed for the original Willamette Basin TMDL and WQMP. Adjustments to the existing shade curve models are unlikely to occur as part of this project. However, if it is determined that the models need to be updated DEQ will follow the procedures outlined in this QAPP.

6.1 General model inputs and parameters

6.1.1 CE-QUAL-W2 version 4

The CE-QUAL-W2 version 4 model is a 2-dimensional hydrodynamic and water quality model that incorporates temperature (heat) into its hydrodynamic and water quality subroutines. CE-QUAL-W2 is two dimensional in the longitudinal and vertical directions, and the vertical dimension allows for modeling temperature profiles as a function of depth in the water column. This feature is critical for deeper water bodies, such as reservoirs, larger rivers and estuaries where light penetration and density profiles are not easily estimated uniformly throughout the water column. Documentation for CE-QUAL-W2, and the inputs used to set up and calibrate the model, are provided in the CE-QUAL-W2 user's manual (Wells, 2019). Parameters adjusted to improve calibration of the Willamette CE-QUAL-W2 models are documented in Annear et al., 2004; Berger et al., 2004; Sullivan and Rounds, 2004; and DEQ, 2006.

6.2 Data gaps

Non-steady state stream models typically require a significant amount of data because of the large spatial and temporal extents the models typically encompass. As the model size or modeling period increase, the amount of information needed to parameterize it also increases. Often it is not possible to parameterize a

model entirely from field data because it can be resource intensive or impractical to collect everything that is needed. In general, these data gaps may be considered and addressed in a number of ways. Table 8 summarizes methods that are used to derive the data needed to parameterize the model.

To the greatest extent possible, the method used to derive the model parameters for the existing TMDL models have been summarized in the boundary conditions and tributary inputs tables in the sections of model inputs in the current Chapter 6.

Table 8: Methods to derive model parameters for data gaps.

Method	Possible Parameters	Description
Direct surrogate	Tributary temperatures, meteorological inputs, sediment	Often, neighboring or nearby tributary watersheds share climatological and landscape features. Model parameters that have an incomplete record or no data may be parameterized using data from a neighboring or nearby location where data is available.
Calibration adjustment	All inputs	In some instances, a significant input may be required for appropriate representation in the modeling, however little may be known about the nature of that input. An example of this is groundwater influx and temperature. Datasets for these inputs can be estimated by adjusting the necessary values within acceptable ranges during the calibration process.
Literature-based values	All inputs	Literature values are often used for model parameters or unquantified model inputs when little is known about the site-specific nature of those inputs. Examples of these types of parameters include stream bed heat transfer properties, hyporheic characteristics or substrate porosity (Bencala and Walters, 1983; Hart, 1995; Pelletier et al., 2006; Sinokrot and Stefan, 1993).
Mass balance	Tributary temperature and flow	On main stem modeled reaches, tributary stream flow or temperature can be estimated using a mass balance approach assuming either flow or temperature data for the tributary are known. If estimating temperature, flow is required, and if estimating flow, temperature is required. Often TIR data are used to estimate tributary flow because upstream, downstream and tributary temperatures are known, and upstream and tributary flows are known (or estimated).
Simple linear regression	Tributary temperature and flow	Parameters such as flow and temperature in neighboring or nearby tributaries often demonstrate similar diurnal patterns or hydrographs which allow for the development of suitable mathematical relationships (simple linear regression) in order to fill the data gaps for those inputs. This method requires at least some data exist for the incomplete dataset in order to develop the relationship.

Method	Possible Parameters	Description
Drainage area ratio	Tributary flow	For ungaged tributaries, flows can be estimated using the ratio between the watershed drainage areas of the ungaged location and from a nearby gaged tributary (Ries et al., 2017; Risley, 2009; Gianfagna, 2015). For example, if the watershed area upstream of a gaged tributary is 10 square kilometers, and the watershed area of an ungaged tributary is 5, the flows in the ungaged tributary are estimated to be half of those in the gaged tributary. The method is typically used to calculate low flow or flood frequency statistics. In that context a weighting factor is recommended when the drainage area ratio of the two sites is between 0.5 and 1.5. Weighting factors can be evaluated if instantaneous observed flows are available at the ungaged location.
Flow-probability-probability-flow (QPPQ)	Tributary flow	The flow-probability-probability-flow (QPPQ) method makes use of relating flow duration curves between a gaged tributary and an ungaged tributary (Lorenz and Ziegeweid, 2016). The flow duration curve at ungaged sites is estimated using regression approaches (Risley et al., 2008) and the online USGS tool StreamStats (Ries et al., 2017).
Adiabatic adjustment	Air temperature	Air temperature can vary significantly throughout a watershed, particularly with large differences in elevation from headwaters to the mouth of the drainage. To account for these differences, air temperatures can be adjusted using an equation that relates air temperature measured at a meteorological station to a location of a given elevation using the dry adiabatic lapse rate of 9.8 °C/km and the differences in elevation.
GIS Data	Channel position, Channel width, Landcover, Gradient, Elevation, Topographic shade angles	Several landscape scale GIS data sets can be used to derive a number of model parameters. Digital orthophotos quads (DOQs) are used to classify landcover and estimate vegetation type, height, density, and overhang. DOQs can also be used to determine stream position, stream aspect, and channel width. A digital elevation model (DEM) consists of digital information that provides a uniform matrix of terrain elevation values. It provides basic quantitative data for deriving surface elevation, stream gradient, and maximum topographic shade angles.

6.3 Effective shade curves and lookup tables

Effective shade curves are plots that present the maximum possible effective shade as a function of different types of natural near-stream vegetation, active channel widths, and stream aspect. Channel width is plotted on the x-axis, effective shade is on the y-axis, and a separate symbol and/or line color is used for each stream aspect. Separate plots are produced for each type of natural vegetation that is expected in the TMDL project area. The plots are called effective shade curves because the pattern on the plot resembles a gentle downward slopping curve. As channel width increases effective shade gets smaller.

The plots are produced from the output of Heat Source version 6 shade models that have been parameterized with every combination of the previously mentioned conditions. The effective shade curve approach can be used almost anywhere to quantify the amount of background solar radiation loading and the effective shade necessary to eliminate temperature increases from anthropogenic disturbance or removal of near-stream vegetation.

This model approach can also be used to develop a lookup table to determine the effective shade resulting from other combinations vegetation height, vegetation density, vegetation overhang, and vegetation buffer widths that are different from background conditions. The lookup table provides a convenient way for readers of the TMDL to estimate the effective shade for current conditions without using the model. The lookup table can also be used as a reverse lookup to determine what vegetation height, buffer width, or vegetation density would achieve a certain effective shade.

6.3.1 Model domain

The model domain is not specific to any single waterbody but will be parameterized using a latitude and longitude located in the TMDL watershed to ensure that the modeled solar altitude and sun angles are appropriate for the area.

6.3.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 30 meters. Outputs are generated every 100 meters. The spatial resolution is not very meaningful however, since each output distance step will represent a unique combination of the different modeled vegetation and channel conditions. The model time step (*dt*) is 1 minute and outputs are generated every hour.

6.3.3 Source characteristics

The effective shade curve approach can be used almost anywhere in the watershed to quantify the amount of background solar radiation loading and the effective shade necessary to eliminate temperature increases from anthropogenic disturbance or removal of near-stream vegetation.

The lookup tables can be used to estimate existing shade or current solar loading. Other potential sources of thermal loading and the temperature response will not be evaluated by this model.

6.3.4 Time frame of simulation

The model period is a single day in late July or early August. This time frame was chosen to characterize the solar loading when maximum stream temperatures are observed, the sun altitude angle is highest, and the period of solar exposure is longest.

6.3.5 Important assumptions

Models used to develop effective shade curves assume no cloud cover and no topographic shade. The modeled terrain is flat so there is no difference in ground elevation between the stream and the adjacent vegetation buffer area. The vegetation density, vegetation height, vegetation overhang, and vegetation buffer width are assumed to be equal on both sides of the stream. The width of the active channel is assumed to be equal to the distance between near-stream vegetation on either side of the stream.

Effective shade curves were developed for the original Willamette Basin TMDL and WQMP. Adjustments to the existing shade curve models are unlikely to occur as part of this project. However, if it is determined that the models need to be updated DEQ will follow the procedures outlined in this QAPP.

6.3.6 Model inputs

There are two categories of models each with different sets of inputs:

- Effective shade curves: Model input values for vegetation height, vegetation density, vegetation overhang, and vegetation buffer width correspond to the restored streamside vegetation types expected in areas that are currently lacking streamside vegetation because of anthropogenic disturbance. The specific values will be determined during the TMDL process and will likely be the same or similar to the values presented in the Willamette Basin TMDL and WQMP. The other model inputs are the same as what is described in Table 9.
- Effective shade lookup tables: Model input values to be used for the lookup tables are described in Table 9.

Table 9: Range of model inputs to be used for effective shade lookup tables.

Model Input	Value Range
Vegetation height (meters)	0 - 90 (or expected maximum)
Vegetation density (percent)	0 -100
Vegetation overhang (meters)	0 - 3 (or expected maximum)
Vegetation buffer width (meters)	0 - 45
Active channel width (meters)	0 - 100 (or expected maximum)
Stream aspect (degrees)	North/South (0/180); Northeast/Southwest (45/225); East/West (90/270); Southeast/Northwest (135/315)
Topographic shade angles (degrees)	0
Cloudiness	0

6.4 Clackamas River

The Clackamas River model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USEPA's contractor Tetra Tech. This model is an update of an older CE-QUAL-W2 model originally calibrated to the period of approximately April through October of 2001 and 2002. The model was developed by Portland State University (Annear et al., 2004 and Berger et al., 2004), with updates to reflect parameters and inputs from a separate CE-QUAL-W2 model of the Clackamas River developed by Portland General Electric (PGE).

6.4.1 Model domain

The extent of the model domain is the Clackamas River from River Mill Dam (Estacada Lake, Clackamas River RM 22.6) to the river's confluence with the Willamette River. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.4.2 Spatial and temporal resolution

The existing 2001/2002 model input bathymetry uses one water body and two branches. The branches were selected based on changes in the channel bottom slope. The model grid has 149 segments; 145 of which are active (Branch 1 Segments 2 to 94 and Branch 2 Segments 97 to 148); and each segment has a length of 251.06 meters. The upstream boundary is configured using the flow and temperature from the USGS gage station at Estacada. The downstream boundary condition is configured as an artificial spillway which discharges to the Willamette River.

6.4.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the Clackamas River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by River Mill Dam (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and widening and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There is one permitted individual NPDES point source along the model extent. Detail about the point source is summarized in Table 10.

Table 10: Summary of individual NPDES permitted discharges in the Clackamas River.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
ODFW - Clackamas River Hatchery (64442)	45.2959/-122.362	NPDES-IW-B17: Dairies, fish hatcheries and other confined feeding operations on individual permits	Clackamas River RM 22.6

The majority land uses along the Clackamas River are forestry and agriculture accounting for about 70 percent of the near-stream area. Table 11 summarizes all the land uses within 300 meters of the digitized Clackamas River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 11: Summary of land uses within 300 meters of the digitized Clackamas River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	1089.5	22.9
Hay/Pasture	1080.8	22.7
Woody Wetlands	628.3	13.2

2016 NLCD Land Cover	Acres	Percent of Total Acres
Emergent Herbaceous Wetlands	411.4	8.6
Developed, Open Space	322.7	6.8
Developed, Low Intensity	308.7	6.5
Mixed Forest	293.8	6.2
Developed, Medium Intensity	236.2	5.0
Herbaceous	119.6	2.5
Developed, High Intensity	69.6	1.5
Barren Land	65.6	1.4
Shrub/Scrub	56.5	1.2
Deciduous Forest	44.0	0.9
Cultivated Crops	38.0	0.8

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 12).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 12 summarizes the potential designated management agencies and responsible persons along the Clackamas River model extent.

Table 12: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized Clackamas River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Forestry - Private Forestland	1562.4	25.8
Clackamas County	1239.3	20.5
Oregon Department of Agriculture	956.9	15.8
Oregon Department of State Lands (waterway)	808.4	13.4
Oregon Parks and Recreation Department	447.3	7.4
City of Gladstone	340.6	5.6
City of Oregon City	229.1	3.8
City of Happy Valley	195.1	3.2
Oregon Department of Transportation	96	1.6
State of Oregon	65.5	1.1
U.S. Bureau of Land Management	59.6	1
City of West Linn	23.4	0.4

DMA or Responsible Person	Acres	Percent of Total Acres
U.S. Government	9.7	0.2
Union Pacific Railroad	6.1	0.1
Bonneville Power Administration	5.2	0.1
City of Estacada	0.4	<0.05

6.4.4 Time frame of simulation

Data availability during the year 2015 and 2016 were evaluated. The proposed model simulation period is the year 2015. The modeling period will cover the months from April to November to be consistent with the USGS v4.2 models.

6.4.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions.

6.4.6 Model inputs

Table 13 summarizes the model configuration of the model input parameters and the source of these data. Meteorological, flow, and temperature input parameters are summarized in the table along with relevant data gaps.

For meteorological input development, previously PGE data from River Mill Dam was used for air temperature in conjunction with Eagle Creek to fill in gaps. Air temperature data from River Mill Dam is not currently available. Air temperature data from Eagle Creek in conjunction with Aurora State Airport will potentially be used.

Daily flow values were developed for Deep Creek, Clear Creek, and Eagle Creek by Kent Doughty with EES, a consultant in the modeling effort for the Lower Clackamas River for PGE. Further flow relationships were also developed with the USGS gage at Estacada to fill in gags during the development of the current conditions calibration model. It is anticipated that these flow correlations will be used to develop tributary flow boundaries for the 4 tributaries (Eagle Creek, Deep Creek, Clear Creek, and Rock Creek) in the 2015 model.

There is one point source, the Clackamas River Fish Hatchery, for which flow and water temperature data will be updated using DMR data. This point source input is not discussed in the PSU model documentation (Annear et al., 2004) but this input is included in the model received by Tetra Tech from DEQ. Further the model includes withdrawals at five specific locations which are not discussed in the PSU documentation (Annear et al., 2004). Withdrawal information will be required for 2015 for model development.

The distributed flows were estimated. The daily tributary flows and the daily upstream flow at Estacada were summed and then subtracted from the flow measured at Oregon City to estimate any additional inflow to the river attributable to the ungaged drainage areas. The total distributed flow was then divided in two based on the lengths of the two model branches. The five withdrawals identified in the model would also need to be included in the flow balance.

Water temperature data for each of the four tributaries was previously available from PGE during 2001/2002 is not available for 2015/2016. This is an important data gap (along with the Fish Hatchery data) that needs be filled. Water Temperature at Eagle Creek and Deep Creek can potentially be estimated using regression relationships developed between the Estacada USGS site. No water temperature data is available for Clear Creek. For Rock Creek previously, data from Deep Creek were directly used for this tributary and can be used. No groundwater monitoring water temperature data is available for 2015 or 2016, similar to what was collected by PGE during 2000 and 2001 which was used to configure the distributed tributary temperatures.

Table 13: Boundary condition and tributary inputs to the Clackamas River Heat Source model.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Model Branch 1 and Branch 2	Branch 1 22.54 to 8.19 and Branch 2 8.03 to 0	Distributed Tributary	Flow	Derived data.	Total distributed inflow was derived previously (Annear et al., 2004) using USGS flow gages (at Estacada and Oregon City). Since Annear et al. (2004)'s report does not discuss withdrawals, they would also need to be accounted for when doing flow balance. Use same approach as done previously; i.e., to derive flow.
Model Branch 1 and Branch 2	Branch 1 22.54 to 8.19 and Branch 2 8.03 to 0	Distributed Tributary	Water Temperature	Derived data.	No Data; 2001 simulation used observed PGE GW data, whereas 2002 simulation used observed GW from 2000. Use GW temperatures monitored during 2000 and 2001 as guide to specify distributed tributary temperature. Any groundwater temperature monitoring done by PGE or any other Agency recently?

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Clackamas River Fish Hatchery (64442)	22.23/4	Point Source	Flow	DEQ	DMRs
Clackamas River Fish Hatchery (64442)	22.39/3	Point Source	Outflow		
Clackamas River Fish Hatchery (64442)	22.23/4	Point Source	Water Temperature	DEQ	DMRs
Clear Creek	8.35/93	Tributary	Flow	Derived data.	No Data; Use flow correlations developed for 2001.
Rock Creek	6.79/105	Tributary	Flow	Derived data.	No Data; Use flow correlations developed for 2001.
Eagle Creek	16.3/42	Tributary	Flow	Derived data.	No Data; Use flow correlations developed for 2001.
Deep Creek	12.25/68	Tributary	Flow	Derived data.	No Data; Use flow correlations developed for 2001.
Clear Creek at mouth (30437-ORDEQ)	8.35/93	Tributary	Water Temperature	Derived data.	No Data; PGE station collected data for 2001-2002; PGE CLCRMH & LSAR 30437 Does PGE have 2015/2016 data? Previously data from Deep Creek were used for this tributary.
Rock Creek	6.79/105	Tributary	Water Temperature	Derived data.	No Data.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Eagle Creek at mouth (30440-ORDEQ)	16.3/42	Tributary	Water Temperature	Derived data.	No Data; PGE station collected data for 2001-2002; PGE ECMOTH & LSAR 30440; Use temperature correlation developed between Eagle Creek and the Clackamas River at Estacada (USGS 14210000).
Deep Creek at mouth (30438-ORDEQ)	12.25/68	Tributary	Water Temperature	Derived data.	No Data; PGE station collected data for 2001-2002; PGE DCMOTH & LSAR 30440. Potentially use temperature correlation developed between Deep Creek and the Clackamas River at Estacada (USGS 14210000).
Clackamas River at Estacada, OR (14210000)	22.22/2	Upstream Boundary	Flow	USGS	
Clackamas River at Estacada, OR (14210000)	22.54/2	Upstream Boundary	Water Temperature	USGS	
QWD-1	3.82/124	Withdrawal	Outflow	Derived data.	No Data; PSU model report (Annear et al., 2004) has no withdrawals. If data is not available, same data from previous modeling effort will be used.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
QWD-2	3.04/129	Withdrawal	Outflow	Derived data.	No Data; PSU model report (Annear et al., 2004) has no withdrawals. If data is not available, same data from previous modeling effort will be used.
QWD-3	2.11/135	Withdrawal	Outflow	Derived data.	No Data; PSU model report (Annear et al., 2004) has no withdrawals. If data is not available, same data from previous modeling effort will be used.
QWD-4	0.86/143	Withdrawal	Outflow	Derived data.	No Data; PSU model report (Annear et al., 2004) has no withdrawals. If data is not available, same data from previous modeling effort will be used.
Aurora State Airport	Applied across entire waterbody (WB1)	Meteorological	Air Temperature, Cloudiness, Dew Point Temperature, Relative Humidity, Wind Direction, Wind Speed	NCDC	Provides most of the surface airways parameters (12 miles SW of confluence of Clackamas with Willamette River).
Eagle Creek (EGKO3)		Meteorological	Air Temperature, Cloudiness, Dew Point Temperature, Relative Humidity, Wind Direction, Wind Speed	MesoWest	Previously PGE data from River Mill Dam was used for Air Temperature in conjunction with Eagle Creek to fill in gaps.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Eagle Creek (GHCND:USR0000OEAG)		Meteorological	Air Temperature	NCDC	

Hourly meteorology inputs into the model include air temperature, cloudiness, dew point temperature, relative humidity, wind direction, and wind speed. Air temperature data may be modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds may be adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade conditions reflect the vegetation conditions in the early 2000s.

6.4.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period. Water Temperature data were available at the two USGS sites located at the upstream and downstream model extents, however data at four locations where river water temperature data were previously available from PGE, in the current conditions model during 2001/2002, are not available for 2015 or 2016 (Table 14). Wetted Channel widths were available during April and August of 2002 as part of field surveys done by the USGS. Wetted channel width data are not available for 2015 and/or 2016 for calibration purposes.

The current condition calibration parameters (i.e., from 2001/2002) may need to be updated in the 2015 model to reflect spawning period conditions. Potential calibration adjustments may be made to Manning's coefficient, wind sheltering, evaporation, and sediment temperatures. Vegetative and topographic shade characteristics will not be adjusted since the model input was developed using a detailed GIS analysis. The model calibration location and available data during the year 2015 are shown below in Table 14.

Table 14: Calibration sites and parameters used in the Clackamas River Heat Source model.

Model Location Name (Station ID)	Model River Mile /Segment Number	Calibration Parameter	Data Source
Clackamas River at Estacada, OR (14210000)	22.22/2	Water Temperature, Water Level, Flow	USGS
Clackamas River near Oregon City, OR (14211010)	2.42/133	Water Temperature, Water Level, Flow	USGS

6.5 Coast Fork and Middle Fork Willamette River

The Coast Fork and Middle Fork Willamette River model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USGS. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model

used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by Portland State University (Annear et al., 2004; Berger et al., 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.5.1 Model domain

The extent of the model domain is the Coast Fork Willamette River from the mouth to Cottage Grove Dam (RM 30), Fall Creek from the Coast Fork Willamette River to Fall Creek Dam (approximately RM 7), and the Middle Fork Willamette River from the mouth to Dexter Dam (approximately RM 17). The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.5.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except where necessary for stability and to improve model run times. The current model uses eight waterbodies and twelve branches. The model grid has 421 segments, with segment length ranging between 250.14 meters and 254.37 meters.

6.5.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the Coast Fork and Middle Fork Willamette River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by Fall Creek, Dexter, Lookout Point, Dorena, and Cottage Grove Dams (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and warming caused by climate change.

There are four permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 15.

Table 15: Summary of individual NPDES permitted discharges in the Coast Fork and Middle Fork Willamette River.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Cottage Grove Lumber (96188)	43.7659/-123.078	NPDES-IW-B19: Timber and Wood Products - Sawmills, log storage, instream log storage.	Coast Fork Willamette River RM 24.2
Cottage Grove STP (20306)	43.8077/-123.048	NPDES-DOM-C2a: Sewage - 1 MGD or more but less than 2 MGD	Coast Fork Willamette River RM 20.6
Jasper Wood Products, LLC (100097)	43.9791/-122.879	NPDES-IW-B21: Timber and Wood Products - Wood preserving	Middle Fork Willamette River RM 9
Lowell STP (51447)	43.9152/-122.783	NPDES-DOM-Da: Sewage - less than 1 MGD	Middle Fork Willamette River RM 15.7

The majority land uses along the Coast Fork and Middle Fork Willamette River are agriculture and forestry accounting for about 75 percent of the near-stream area. Table 16 summarizes all the land uses within 300 meters of the digitized Coast Fork and Middle Fork Willamette River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 16: Summary of land uses within 300 meters of the digitized Coast Fork and Middle Fork Willamette River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Hay/Pasture	4616.5	41.2
Woody Wetlands	1636.8	14.6
Emergent Herbaceous Wetlands	1006.8	9.0
Evergreen Forest	974.8	8.7
Developed, Open Space	855.3	7.6
Developed, Low Intensity	577.1	5.2
Mixed Forest	472.6	4.2
Shrub/Scrub	249.1	2.2
Developed, Medium Intensity	246.0	2.2
Cultivated Crops	158.3	1.4
Deciduous Forest	150.1	1.3
Herbaceous	125.4	1.1
Developed, High Intensity	90.1	0.8
Barren Land	40.9	0.4

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 17).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 17 summarizes the potential designated management agencies and responsible persons along the Coast Fork and Middle Fork Willamette River model extent.

Table 17: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized Coast Fork and Middle Fork Willamette River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Lane County	4818.4	38.4
Oregon Department of Agriculture	2989.7	23.8

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Forestry - Private Forestland	1173.5	9.3
Oregon Department of State Lands - Waterway	936.6	7.5
City of Cottage Grove	713	5.7
Oregon Parks and Recreation Department	682.2	5.4
Oregon Department of Transportation	675.1	5.4
City of Springfield	190.6	1.5
U.S. Government	89.2	0.7
State of Oregon	67.5	0.5
U.S. Bureau of Land Management	61.7	0.5
Central Oregon & Pacific Railroad	60.5	0.5
Union Pacific Railroad	45.5	0.4
Oregon Department of State Lands	33.2	0.3
City of Creswell	20.8	0.2
Bonneville Power Administration	5.7	<0.05

6.5.4 Time frame of simulation

The model period is March 20, 2015 to October 31, 2015.

6.5.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions. Additional assumptions will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

6.5.6 Model inputs

Model inputs will be updated to reflect the stream flow rate, stream temperature, and meteorology conditions for the target calibration years of 2011, 2015, and 2016. The specific model input details will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade conditions reflect the vegetation conditions in the early 2000s.

6.5.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period. The specific model calibration details will be documented in a forthcoming USGS reported estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021). It is expected that some modeling parameters will be adjusted to improve model stability, decrease runtimes, improve model fit, and better reflect current conditions.

Potential calibration adjustments may be made to the Manning's friction coefficient, slope, and the turbulence closure scheme. In some cases, adjustments may be made to the model grid and the configuration of various flow structures (e.g., spillways, pipes, gates, etc.). Artificial tributaries used to balance the water budget in the Coast Fork and Middle Fork Willamette River model will likely be removed and replaced with distributed tributaries, to better simulate the spatial distribution of ungaged gains or losses of flow in the models.

6.6 Long Tom River

The Long Tom River model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USEPA's contractor Tetra Tech. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by Portland State University (Annear et al., 2004; Berger et al., 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.6.1 Model domain

The extent of the model domain is the Long Tom River extends from Fern Ridge Dam (RM 26) to the river's confluence with the Willamette River. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.6.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except where necessary for stability and to improve model run times. The current model input bathymetry uses one water body and 13 branches along the main river and one branch representing a side channel. The branches were incorporated into the model to accurately predict the flow peak timings due to the several weirs/dams that lie along the model domain. The model grid has 187 segments, with segment length ranging from 83.88 meters to 251.06 meters. The side channel is comprised of 3 segments of 1897, 2590, and 1427 meters. The upstream boundary is configured using the flow and temperature from the USGS gage station near Alvadore (USGS 1416999) at RM 23.5. There are ten spillway structures defined along the systems, and three gates. The downstream boundary condition is configured as an artificial gate which discharges to the Willamette River. The model also includes one withdrawal from segment 91 (RM 12.9) of 4 cfs. It should be noted that the PSU documentation (Annear et. al, 2004) notes that there were no withdrawals, however the 2001 and 2002 model do have withdrawals.

6.6.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the Long Tom River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by Fern Ridge Dam (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There is one permitted individual NPDES point source along the model extent. Detail about the point source is summarized in Table 18.

Table 18: Summary of individual NPDES permitted discharges in the Long Tom River.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Monroe STP (57951)	44.315/-123.293	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Long Tom River RM 6.9

The majority land use along the Long Tom River is agriculture accounting for about 79 percent of the near-stream area. Table 19 summarizes all the land uses within 300 meters of the digitized Long Tom River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 19: Summary of land uses within 300 meters of the digitized Long Tom River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Hay/Pasture	2892.2	51.0
Cultivated Crops	1585.5	28.0
Emergent Herbaceous Wetlands	509.7	9.0
Developed, Low Intensity	240.9	4.2
Developed, Open Space	132.1	2.3
Woody Wetlands	117.4	2.1
Developed, Medium Intensity	67.8	1.2
Mixed Forest	30.7	0.5
Developed, High Intensity	25.8	0.5
Evergreen Forest	22.0	0.4
Deciduous Forest	19.1	0.3
Herbaceous	12.9	0.2
Barren Land	9.6	0.2
Shrub/Scrub	2.9	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 20).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 20 summarizes the potential designated management agencies and responsible persons along the Long Tom River model extent.

Table 20: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized Long Tom River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Agriculture	4879.6	82.2
Lane County	338.1	5.7
City of Monroe	260.8	4.4
U.S. Army Corps of Engineers	148.7	2.5
U.S. Bureau of Land Management	100.5	1.7
Benton County	89.5	1.5
Oregon Department of Transportation	71	1.2
Oregon Department of Forestry - Private Forestland	27.9	0.5
Union Pacific Railroad	11.3	0.2
Oregon Department of State Lands - Waterway	4.3	0.1
U.S. Government	2.4	<0.05
U.S. Department of Agriculture	0.7	<0.05

6.6.4 Time frame of simulation

Data availability during the year 2015 and 2016 were evaluated. The proposed model simulation period is the year 2015. The modeling period will cover the months from April to November to be consistent with the USGS v4.2 models.

6.6.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions.

6.6.6 Model inputs

Table 21 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized in the table along with relevant data gaps.

Meteorology data were taken from the Corvallis Airport during 2001 and from the Eugene Airport during 2002. The appropriate meteorology data will be chosen from either Eugene Airport or Corvallis Airport. Note that additional air temperature stations from MesoWest and from NCDC may be available and if necessary will be used to supplement the air temperatures in the meteorological input file.

No tributary inflows were modeled in the existing model setup, rather they are included as distributed tributaries. Flow rates for the distributed tributaries were determined by balancing flows using gaging station data. The only diversion in the model setup is for the Ferguson Dam Diversion set as a constant value of 0.113 cms for 2001 (same was used for 2002). If no data is available for 2015 then the same constant value will be used for flow balance estimation.

Gate flows for Old Long Tom varied slightly for 2001 and 2002, based on the existing input file. Information on this if available can be used to configure 2015. In addition Gate weir elevation for Ferguson Dam and downstream boundary condition were in the 2001/2002 model. Unless new data is available for 2015, the same data will be used for 2015.

There are no point sources represented in the existing model. The City of Monroe STP, which is a new point source input, will be included in the model. DMR data will be queried for this facility and processed for specifying in the model (Table 21).

Table 21: Boundary condition and tributary inputs to the Long Tom River Heat Source model.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Branches 1 through 8, 10, 11, and 14		Distributed Tributary	Flow	Derived data.	To be estimated based on flow balance to the same branches for which it was applied in 2001/2002; No information on how this was calculated is provided in the PSU model documentation.
Ferguson Dam and downstream weir	12.74/92 and 0.08/181	Gate	Elevation	Derived data.	No Data; Same as 2001/2002 for 2015, if unavailable.
Old Tom Channel	13.68/86	Gate	Flow	Derived data.	No Data; Same as 2001/2002 for 2015, if unavailable.
City of Monroe STP	6.9/133	Point Source	Flow	DEQ	New model input; Daily Flow - No Discharge May 1 through October 31.
City of Monroe STP	6.9/133	Point Source	Water Temperature	DEQ	New model input; Bi-weekly.
Ferguson Creek		Tributary	Flow	Derived data.	No Data; Estimated.
Bear Creek		Tributary	Flow	Derived data.	No Data; Estimated.
Ferguson Creek (40089-ORDEQ)		Tributary	Temperature	Long Tom WSC	

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Bear Creek (40092-ORDEQ)		Tributary	Water Temperature	Derived data. Long Tom WSC	Using Owen's Creek near mouth of Bear Creek (40092-ORDEQ) as surrogate.
Long Tom River near Alvadore, OR (14169000)	23.85/2	Upstream Boundary	Flow	USGS	
Long Tom River near Alvadore, OR (14169000)	23.85/2	Upstream Boundary	Water Temperature	USGS	
Ferguson Dam Diversion	12.9/91	Withdrawal	Flow	Derived data.	No Data; 2001 data only; Use same data for 2015?
Corvallis Airport (WBAN 24202 and WBAN 04236)		Meteorological	Air Temperature, Cloudiness, Dew Point Temperature, Relative Humidity, Wind Direction, Wind Speed	NCDC/LCD	2001 model uses data from Corvallis; Solar Radiation was taken from Corvallis AGRIMET site (CRVO).
Eugene Airport (WBAN 24221)		Meteorological	Air Temperature, Cloudiness, Dew Point Temperature, Relative Humidity, Wind Direction, Wind Speed	NCDC/LCD	2002 model uses data from Eugene; Solar Radiation was taken from Eugene SRML (2000 to now).

Hourly meteorology inputs into the model include air temperature, cloudiness, dew point temperature, relative humidity, wind direction, and wind speed. Air temperature data may be modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds may be adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade inputs reflect the vegetation conditions in the early 2000s.

6.6.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period.

Out of the five water temperature calibration station locations only two stations (i.e., the USGS stations at Alvadore and Monroe) have data. The USGS station at Monroe only reports daily min/max/mean water temperatures and is supplemented with the DEQ station 10375 with data collected partially during September, October, and November. All LASAR stations (26749, 26750, and 29644) used previously in the calibration during 2001/2002 do not have data for 2015/2016. Two new calibration stations were identified that had limited data (data was only available during September, October, and November).

The current condition calibration parameters (i.e., from 2001/2002) may need to be updated in the 2015 model to reflect spawning period conditions. Potential calibration adjustments may be made to Manning's coefficient, wind sheltering, evaporation, and sediment temperatures. Vegetative and topographic shade characteristics will not be adjusted since the model input was developed using a detailed GIS analysis. The model calibration location and available data during the year 2015 are shown below in Table 22.

Table 22: Calibration sites and parameters used in the Long Tom River Heat Source model.

Model Location Name (Station ID)	Model River Mile /Segment Number	Calibration Parameter	Data Source	Note
Long Tom River at Bundy Bridge near the mouth (25373-ORDEQ)		Water Temperature	DEQ	New calibration location with limited data. Data is only available during October (4 days), and November (22 days) in 2015. Frequency unknown.
Long Tom River at Monroe, OR (14170000 (Also 10375-ORDEQ))	6.86/134	Water Level, Flow	USGS	
Long Tom River at Stow Pit Road (Monroe) (11140-ORDEQ)		Water Temperature	DEQ	New calibration location with limited data. Data is available during September (15 days), October (16 days), and November (22 days) in 2015. Frequency unknown.
Long Tom River near Alvadore, OR (14169000)	23.85/2	Water Temperature, Water Level, Flow	USGS	

6.7 McKenzie River: Lower

The McKenzie River: Lower model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USGS. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by Portland State University (Annear et al., 2004; Berger et al., 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.7.1 Model domain

The extent of the model domain is the McKenzie River from the mouth to confluence with the South Fork McKenzie River (approximately RM 56), the South Fork McKenzie River to Cougar Dam, and Leaburg and Waterville Canals. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.7.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except to add Leaburg Canal and Waterville Canal and where necessary for stability and to improve model run times. The model is expected to have seven waterbodies and twelve branches. The model grid will have 474 segments, with each segment length being 250.55 meters.

6.7.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the McKenzie River: Lower include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by Blue River and Cougar Dams (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are three permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 23.

Table 23: Summary of individual NPDES permitted discharges in the McKenzie River: Lower.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Ip Springfield Paper Mill (96244)	44.0539/-122.959	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	McKenzie River RM 14.7
ODFW - Leaburg Hatchery (64490)	44.1203/-122.609	NPDES-IW-B17: Dairies, fish hatcheries and other confined feeding operations on individual permits	McKenzie River RM 33.7
ODFW - Mckenzie River Hatchery (64500)	44.1166/-122.636	NPDES-IW-B17: Dairies, fish hatcheries and other confined feeding operations on individual permits	McKenzie River RM 31.5

The majority land uses along the McKenzie River: Lower are forestry and agriculture accounting for about 82 percent of the near-stream area. Table 24 summarizes all the land uses within 300 meters of the digitized McKenzie River: Lower centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 24: Summary of land uses within 300 meters of the digitized McKenzie River: Lower centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	3400.2	29.7
Hay/Pasture	2749.5	24.0
Mixed Forest	1100.0	9.6
Woody Wetlands	928.1	8.1
Developed, Open Space	898.9	7.8
Emergent Herbaceous Wetlands	718.3	6.3
Shrub/Scrub	387.4	3.4
Herbaceous	358.9	3.1
Cultivated Crops	256.2	2.2
Deciduous Forest	254.4	2.2
Developed, Low Intensity	252.0	2.2
Developed, Medium Intensity	76.7	0.7
Barren Land	62.5	0.5
Developed, High Intensity	10.2	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 25).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 25 summarizes the potential designated management agencies and responsible persons along the McKenzie River: Lower model extent.

Table 25: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized McKenzie River: Lower centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Lane County	4635.4	33.8
Oregon Department of Agriculture	2763.9	20.1
Oregon Department of Forestry - Private Forestland	1948.1	14.2

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of State Lands - Waterway	1911.5	13.9
U.S. Bureau of Land Management	905.9	6.6
U.S. Forest Service	607.8	4.4
Oregon Department of Transportation	372.7	2.7
City of Springfield	191.1	1.4
City of Eugene	177.7	1.3
Oregon Parks and Recreation Department	73.5	0.5
Oregon Department of State Lands	68.3	0.5
U.S. Army Corps of Engineers	25.1	0.2
U.S. Department of Agriculture	18.3	0.1
U.S. Government	14.7	0.1
Bonneville Power Administration	5.8	<0.05
Oregon Department of Fish and Wildlife	4.5	<0.05
Union Pacific Railroad	0.5	<0.05

6.7.4 Time frame of simulation

The model period is March 20, 2015 to October 31, 2015.

6.7.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions. Additional assumptions will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

6.7.6 Model inputs

Model inputs will be updated to reflect the stream flow rate, stream temperature, and meteorology conditions for the target calibration years of 2011, 2015, and 2016. The specific model input details will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade inputs reflect the vegetation conditions in the early 2000s.

6.7.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period. The specific model calibration details will be documented in a forthcoming USGS reported estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021). It is expected that some modeling parameters will be adjusted to improve model stability, decrease runtimes, improve model fit, and better reflect current conditions.

Potential calibration adjustments may be made to the Manning's friction coefficient, slope, and the turbulence closure scheme. In some cases, adjustments may be made to the model grid and the configuration of various flow structures (e.g., spillways, pipes, gates, etc.). Artificial tributaries used to balance the water budget in the the existing McKenzie model will likely be removed and replaced with distributed tributaries, to better simulate the spatial distribution of ungaged gains or losses of flow in the models.

6.8 North Santiam and Santiam River

The North Santiam and Santiam River model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USGS. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by the USGS (Sullivan and Round, 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.8.1 Model domain

The extent of the model domain is the North Santiam River from the mouth to Detroit Dam (approximately RM 49) and the Santiam River from the mouth to confluence of North and South Santiam Rivers (all 12 miles). The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.8.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except where necessary for stability and to improve model run times. The current model uses six waterbodies and six branches. The model grid has 322 segments, with each active segment being 304.8 meters.

6.8.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the North Santiam and Santiam River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by Big Cliff and Detroit Dams (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are three permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 26.

Table 26: Summary of individual NPDES permitted discharges in the North Santiam and Santiam River.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Frank Lumber Co. Inc. (30904)	44.7491/-122.504	NPDES-IW-B19: Timber and Wood Products - Sawmills, log storage, instream log storage.	North Santiam River RM 32.5

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Jefferson STP (43129)	44.724/-123.01	NPDES-DOM-Da: Sewage - less than 1 MGD	Santiam River RM 9.2
Stayton STP (84781)	44.7914/-122.804	NPDES-DOM-C2a: Sewage - 1 MGD or more but less than 2 MGD	North Santiam River RM 14.9

The majority land uses along the North Santiam and Santiam River are forestry and agriculture accounting for about 78 percent of the near-stream area. Table 27 summarizes all the land uses within 300 meters of the digitized North Santiam and Santiam River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 27: Summary of land uses within 300 meters of the digitized North Santiam and Santiam River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	3069.5	24.0
Hay/Pasture	2452.8	19.2
Woody Wetlands	1605.9	12.6
Cultivated Crops	1523.0	11.9
Emergent Herbaceous Wetlands	1361.9	10.7
Developed, Open Space	673.2	5.3
Shrub/Scrub	510.8	4.0
Mixed Forest	416.1	3.3
Developed, Low Intensity	390.7	3.1
Herbaceous	265.5	2.1
Developed, Medium Intensity	167.2	1.3
Barren Land	158.8	1.2
Deciduous Forest	102.7	0.8
Developed, High Intensity	77.2	0.6

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 28).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 28 summarizes the potential designated management agencies and responsible persons along the North Santiam and Santiam River model extent.

Table 28: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized North Santiam and Santiam River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Agriculture	5973.8	43.6
Oregon Department of Forestry - Private Forestland	2169.9	15.8
Linn County	753.4	5.5
Oregon Department of State Lands - Waterway	655.9	4.8
Oregon Department of Transportation	479.7	3.5
City of Mill City	454.1	3.3
Marion County	414.3	3
U.S. Army Corps of Engineers	398.7	2.9
Oregon Department of Forestry - State Forestland	348.1	2.5
City of Gates	321.8	2.3
U.S. Bureau of Land Management	265	1.9
City of Salem	253	1.8
State of Oregon	200.7	1.5
City of Stayton	190.8	1.4
Oregon Department of Geology and Mineral Industries	173.8	1.3
Oregon Department of Fish and Wildlife	148.8	1.1
City of Jefferson	130.9	1
U.S. Forest Service	110.6	0.8
Oregon Parks and Recreation Department	101.5	0.7
City of Lyons	87.7	0.6
Albany & Eastern Railroad	30.2	0.2
U.S. Government	27.6	0.2
Portland & Western Railroad	5.1	<0.05
Union Pacific Railroad	2.7	<0.05
Bonneville Power Administration	1	<0.05

6.8.4 Time frame of simulation

The model period is March 21, 2015 to October 31, 2015.

6.8.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Sullivan and Rounds (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions. Additional assumptions will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

6.8.6 Model inputs

Model inputs will be updated to reflect the stream flow rate, stream temperature, and meteorology conditions for the target calibration years of 2011, 2015, and 2016. The specific model input details will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade inputs reflect the vegetation conditions in the early 2000s.

6.8.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period. The specific model calibration details will be documented in a forthcoming USGS reported estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021). It is expected that some modeling parameters will be adjusted to improve model stability, decrease runtimes, improve model fit, and better reflect current conditions. Potential calibration adjustments may be made to the Manning's friction coefficient, slope, and the turbulence closure scheme. In some cases, adjustments may be made to the model grid and the configuration of various flow structures (e.g., spillways, pipes, gates, etc.).

6.9 South Santiam River

The South Santiam River model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USGS. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by Portland State University (Annear et al., 2004; Berger et al., 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.9.1 Model domain

The extent of the model domain is the South Santiam River from the mouth up to Foster Dam (approximately RM 38). The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.9.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except where necessary for stability and to improve model run times. The current model uses five waterbodies and seven branches. The model grid has 316 segments, with segment length ranging between 152.5 meters and 199.5 meters.

6.9.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the South Santiam River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by Foster and Green Peter Dams (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and warming caused by

climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are two permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 29.

Table 29: Summary of individual NPDES permitted discharges in the South Santiam River.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Lebanon WWTP (49764)	44.5488/-122.896	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	South Santiam River RM 17.4
Sweet Home STP (86840)	44.4/-122.736	NPDES-DOM-C2a: Sewage - 1 MGD or more but less than 2 MGD	South Santiam River RM 31.5

The majority land uses along the South Santiam River are agriculture and forestry accounting for about 78 percent of the near-stream area. Table 30 summarizes all the land uses within 300 meters of the digitized South Santiam River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 30: Summary of land uses within 300 meters of the digitized South Santiam River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Hay/Pasture	3222.3	42.7
Emergent Herbaceous Wetlands	908.0	12.0
Evergreen Forest	778.4	10.3
Cultivated Crops	763.5	10.1
Woody Wetlands	643.2	8.5
Developed, Open Space	288.4	3.8
Developed, Low Intensity	278.0	3.7
Herbaceous	170.8	2.3
Shrub/Scrub	138.1	1.8
Mixed Forest	116.5	1.5
Barren Land	98.5	1.3
Developed, Medium Intensity	95.9	1.3
Developed, High Intensity	26.2	0.3
Deciduous Forest	24.2	0.3

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of

different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 31).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 31 summarizes the potential designated management agencies and responsible persons along the South Santiam River model extent.

Table 31: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized South Santiam River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Agriculture	4986.7	63
Linn County	1319.3	16.7
Oregon Department of Forestry - Private Forestland	547.6	6.9
City of Sweet Home	511.9	6.5
City of Lebanon	239.6	3
Oregon Department of Transportation	100.7	1.3
City of Waterloo	53.8	0.7
State of Oregon	48.5	0.6
Oregon Department of State Lands - Waterway	41.6	0.6
U.S. Army Corps of Engineers	28.8	0.4
U.S. Bureau of Land Management	15.5	0.2
Oregon Department of Geology and Mineral Industries	8.1	0.1
Albany & Eastern Railroad	5.9	0.1
U.S. Government	4.7	0.1

6.9.4 Time frame of simulation

The model period is March 21, 2015 to October 31, 2015.

6.9.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions. Additional assumptions will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

6.9.6 Model inputs

Model inputs will be updated to reflect the stream flow rate, stream temperature, and meteorology conditions for the target calibration years of 2011, 2015, and 2016. The specific model input details will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade inputs reflect the vegetation conditions in the early 2000s.

6.9.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period. The specific model calibration details will be documented in a forthcoming USGS reported estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021). It is expected that some modeling parameters will be adjusted to improve model stability, decrease runtimes, improve model fit, and better reflect current conditions. Potential calibration adjustments may be made to the Manning's friction coefficient, slope, and the turbulence closure scheme. In some cases, adjustments may be made to the model grid and the configuration of various flow structures (e.g., spillways, pipes, gates, etc.).

6.10 Willamette River: Lower

The Willamette River: Lower model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USEPA's contractor Tetra Tech. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by Portland State University (Annear et al., 2004; Berger et al., 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.10.1 Model domain

The extent of the model domain is can be defined by two reaches: (1) The Lower Willamette River from the mouth to Willamette Falls (RM 26.5), including the Willamette Channel and the Multnomah Channel (2) Columbia River from Beaver Army Terminal (Columbia River Mile 53.8) to Bonneville Dam (RM 144.5). The Willamette River enters the Columbia River at Columbia River Miles 87 and 101. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.10.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except where necessary for stability and to improve model run times. The current model is comprised of two waterbodies, with a total of 13 branches. The first water body consists of two branches: the first is the main stem of the Willamette River and the second is Multnomah Channel. The Columbia River represents the second water body with 11 branches. The first branch in water body two is the main channel of the Columbia River and the remaining 10 branches are tributary inflow reaches or side channels around islands. Segment size was based on the spacing of the bathymetry data cross sections (Annear et al., 2004). The model's vertical grid resolution is 2 meters throughout, with a maximum of 28 layers.

6.10.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the Willamette River: Lower include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by upstream dams (Rounds, 2010), and background sources (DEQ,

2006). Other potential sources include channel modification and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are 19 permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 32.

Table 32: Summary of individual NPDES permitted discharges in the Willamette River: Lower.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Arkema (68471)	45.5713/-122.745	NPDES-IW-B14: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 1 sources	Willamette River RM 7.2
Arkema (68471)	45.5713/-122.745	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 7.4
Ash Grove Cement - Rivergate Lime Plant (3690)	45.6229/-122.784	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 3.3
BDC/Willamette LLC (109444)	45.479/-122.673	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 15.8
Evraz Oregon Steel (64905)	45.6256/-122.779	NPDES-IW-B08: Primary smelting and/or refining - Ferrous and non-ferrous metals not elsewhere classified	Willamette River RM 2.4
Gresham, City Of - Municipal Stormwater MS4 (108013)	45.5164/-122.535	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Willamette River RM 12.6
Multnomah County MS4 (120542)	45.54/-122.41	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Willamette River RM 12.6
NW Natural Gas Site Remediation (120589)	45.5791/-122.757	NPDES-IW-B14: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 1 sources	Willamette River RM 6.4
Oak Lodge Water Services Water Reclamation Facility (62795)	45.4241/-122.652	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 20.1

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
OHSU Center For Health And Healing (113611)	45.4994/-122.671	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 14.5
Portland, City Of - Municipal Stormwater MS4 (108015)	45.5506/-122.62	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Willamette River RM 2
Scappoose STP (78980)	45.7526/-122.856	NPDES-DOM-Da: Sewage - less than 1 MGD	Multnomah Channel RM 10.6
Siltronic Corporation (93450)	45.5775/-122.755	NPDES-IW-B14: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 1 sources	Willamette River RM 6.6
SLLI (74995)	45.5665/-122.747	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 7
Tryon Creek WWTP (70735)	45.4213/-122.658	NPDES-DOM-Ba: Sewage - 5 MGD or more but less than 10 MGD	Willamette River RM 20.3
Univar USA Inc (100517)	45.5486/-122.723	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 9
Vigor Industrial (70596)	45.5625/-122.716	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 8.2
WES (Kellogg Creek WWTP) (16590)	45.4398/-122.642	NPDES-DOM-A3: Sewage - 10 MGD or more but less than 25 MGD	Willamette River RM 18.5
WES (Tri-City WPCP) (89700)	45.3759/-122.589	NPDES-DOM-A3: Sewage - 10 MGD or more but less than 25 MGD	Willamette River RM 25.5

The majority land uses along the Willamette River: Lower are developed areas and emergent herbaceous wetlands accounting for about 67 percent of the near-stream area. Table 33 summarizes all the land uses within 300 meters of the digitized Willamette River: Lower centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 33: Summary of land uses within 300 meters of the digitized Willamette River: Lower centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Emergent Herbaceous Wetlands	1410.6	26.0
Developed, Low Intensity	707.9	13.0
Developed, High Intensity	582.2	10.7
Hay/Pasture	563.1	10.4
Developed, Medium Intensity	491.5	9.1
Developed, Open Space	445.7	8.2
Woody Wetlands	444.3	8.2
Cultivated Crops	385.0	7.1
Evergreen Forest	159.0	2.9
Barren Land	80.7	1.5
Herbaceous	67.2	1.2
Mixed Forest	56.7	1.0
Shrub/Scrub	19.1	0.4
Deciduous Forest	13.6	0.3

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 34).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 34 summarizes the potential designated management agencies and responsible persons along the Willamette River: Lower model extent.

Table 34: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized Willamette River: Lower centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
City of Portland	3583	34.8
Oregon Department of Agriculture	1647	16
Oregon Department of State Lands - Waterway	1562.5	15.2
Oregon Department of Fish and Wildlife	680	6.6
Clackamas County	560	5.4
City of West Linn	324.7	3.2
Portland & Western Railroad	283.8	2.8
Columbia County	283.1	2.7

DMA or Responsible Person	Acres	Percent of Total Acres
Multnomah County	262.7	2.6
City of Lake Oswego	221.7	2.2
Oregon Department of Transportation	169.1	1.6
Oregon Parks and Recreation Department	153.8	1.5
Bonneville Power Administration	153.1	1.5
City of Milwaukie	129.7	1.3
City of St. Helens	110.2	1.1
Port of Portland	81.7	0.8
City of Gladstone	54.5	0.5
Port of St. Helens	16.2	0.2
Oregon Department of Forestry - Private Forestland	11	0.1
City of Scappoose	5	<0.05
Union Pacific Railroad	4.4	<0.05
Willamette Shore Trolley	1.5	<0.05
BNSF Railway	0.7	<0.05
State of Oregon	0.1	<0.05
U.S. Government	<0.05	<0.05

6.10.4 Time frame of simulation

Data availability during the year 2015 and 2016 were evaluated. The proposed model simulation period is the year 2015. The modeling period will cover the months from April to November to be consistent with the USGS v4.2 models.

6.10.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions.

6.10.6 Model inputs

Table 35 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized in the table along with relevant data gaps.

The upstream boundary condition for the Lower Willamette River near the Willamette Falls was characterized by the outflow from the Middle Willamette River model. The PSU report (Annear et al., 2004) notes that “although there are USGS gages station monitoring stage above (USGS 14207740) and below (USGS 14207770) the Willamette Falls, the gage above the falls is not always accurate”.

Some of the missing boundary inputs include water temperature data for the Columbia near Beaver Terminal, water temperature for the Columbia Slough, and water temperature for several tributaries that were previously monitored by Washington Ecology.

Water temperature at Columbia River at Port Westward, near Quincy, OR (Station ID: 14246900) (previously called Beaver Terminal) ends on September 30, 2003. This station was previously used to configure one of the downstream boundaries for the Columbia River. Potentially stations upstream (Astoria, OR) and downstream (Longview, WA) of this location can be considered for use to configure the model for the year 2015. The NOAA station Astoria, OR (Station ID: 9439040) is located approximately 35 miles upstream of Beaver Terminal and has hourly data from November 4, 1993 to current. The Longview, WA station (Station ID: 9440422) is located approximately 12 miles downstream of Beaver Terminal and has hourly data for the period from June 3, 2005 to July 24, 2014 and from October 16, 2015 to current. Note that the Longview station alone cannot be used since it has a gap during 2015, which would need to be filled (potentially using the Astoria station). Alternatively, if appropriate the Astoria station alone can be used to configure the model boundary. All water temperature data would first need to be plotted and analyzed for correlations before using it for configuring the model.

The water temperature data for the Columbia Slough during 2001/2002 was characterized using two monitoring instruments at same location LASAR 11201 and Metro Regional Govt (SJB). Data collected by the City of Portland from North Vancouver St. Bridge (Main Channel – Columbia Slough) VNB will be used to configure the water temperature for the Columbia Slough. Data for the year 2015 is only available for a few months and is not available from May through Octorber during 2015. Data is available for the year 2016 at this station. Available data from other years will be used to develop correlations for filling gaps or will be filled by directly supplementing the data from other years for the missing periods.

Additionally monthly water temperature for several tributaries that were previously monitored by the Washington Ecology in the Monthly Baseflow Characteristics of Selected Washington Rivers and Streams report (Water Supply Bulletin No. 60, Publication No. 99-327, October 1999) would be used for 2015, if no data is available.

The PSU report states that flow contributions from the smaller basins were not determined individually and were incorporated as distributed tributaries (i.e., distributed input in the CE-QUAL-W2 model). However, in a separate distributed tributaries section in the report it is noted that “the total drainage area not considered in the model was about 0.34% of the entire watershed drainage and hence not considered in the model as it was relatively small”. This was confirmed by looking at the current CE-QUAL-W2 model in which the distributed tributaries were turned off.

Point source data are needed for configuring the model for 2015. DMR data will be queried and processed for specifying in the model. In addition to existing point sources currently in the model, there are nine new point sources that have been identified for inclusion into the model. All existing and new point sources have been identified in the Table 35.

Table 35: Boundary condition and tributary inputs to the Willamette River: Lower Heat Source model.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Columbia River at Port Westward, near Quincy, OR (14246900)	53.8/347	Downstream Boundary	Water Level	USGS	No Data prior to 10/1/2015; Use correlation developed by Rodriquez, et al. (2001) to fill the gap as noted in PSU report; Station previously named Columbia River at Beaver Army Terminal near Quincy, OR.
Columbia River at Port Westward, near Quincy, OR (14246900)	53.8/347	Downstream Boundary	Water Temperature	USGS & NOAA	No Data; Water temperature ends at 9/30/2003. Potentially use u/s (~35 miles u/s) NOAA station Astoria. WA 9439040 (11/4/1993 to current) and/or ~12 mile d/s Longview, WA NOAA station 9440422 (6/3/2005 to 7/24/2014 and 10/16/2015 to current). Longview station has a gap during 2015.
Columbia River Left Bank, near Dodson, OR (453630122021400)	141/118	Downstream Boundary	Water Temperature	USGS	Also called Columbia River at Warrendale; Water temperature boundary for Bonneville Outflow.
Univar USA Inc (OR0034606)	RM9	Point Source	Flow	DEQ	Add to Model if data are available; Daily Flow.
Arkema, Inc (OR0001597)	RM7.4	Point Source	Flow	DEQ	Add to Model if data are available.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Arkema, Inc (OR0044695)	RM7.2	Point Source	Flow	DEQ	Daily Flow. No Discharge May 1 through October 31
Starlink Logistics (OR0001741)	RM7	Point Source	Flow	DEQ	Daily Flow.
Vigor Industrial (OR0022942)	RM6.5	Point Source	Flow	DEQ	Once for each vessel.
NW Natural Gas (OR0044687)	RM6.4	Point Source	Flow	DEQ	Daily Flow.
Ash Grove Cement (OR0001601)	RM3.3	Point Source	Flow	DEQ	Daily Flow. No Discharge May 1 through October 31.
BDC/Willamette (OR0040363)	RM15.8	Point Source	Flow	DEQ	Add to Model if data are available; Monthly Flow.
City of Scappoose (OR0022420)	RM10.5796	Point Source	Flow	DEQ	Located on the Multnomah Channel; Influent data only availiable.
Wacker Siltronics (OR0030589)	6.6/84	Point Source	Flow	DEQ	Daily Flow.
Blue Heron Paper Mill (OR0000566)	26.4/2	Point Source	Flow	DEQ	Set to zero - Permit active but no discharge.
Tri-City WWTP (OR0031259)	25.5/6	Point Source	Flow	DEQ	Daily Flow.
Tryon Creek WWTP (OR0026891)	20.4/35	Point Source	Flow	DEQ	Daily Flow.
Oak Lodge WWTP (OR0026140)	20.2/36	Point Source	Flow	DEQ	Daily Flow.
Oregon Steel Mill (OR0000451)	2.8/92	Point Source	Flow	DEQ	Daily Flow.
Kellogg Creek WWTP (OR0026221)	18.7/47	Point Source	Flow	DEQ	Daily Flow.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Oregon Museum of Science and Industry (OR0034371)	13.5/62	Point Source	Flow	DEQ	Daily Flow.
Univar USA Inc (OR0034606)	RM9	Point Source	Water Temperature	DEQ	Add to Model if data are available.
Arkema, Inc (OR0001597)	RM7.4	Point Source	Water Temperature	DEQ	Add to Model if data are available; SW discharge.
Arkema, Inc (OR0044695)	RM7.2	Point Source	Water Temperature	DEQ	Daily Maximum.
Starlink Logistics (OR0001741)	RM7	Point Source	Water Temperature	DEQ	Daily Temperature.
Vigor Industrial (OR0022942)	RM6.5	Point Source	Water Temperature	DEQ	One grab temperature for each vessel.
NW Natural Gas (OR0044687)	RM6.4	Point Source	Water Temperature	DEQ	Daily Maximum.
Ash Grove Cement (OR0001601)	RM3.3	Point Source	Water Temperature	DEQ	Continuous Temperature.
BDC/Willamette (OR0040363)	RM15.8	Point Source	Water Temperature	DEQ	Add to Model if data are available.
City of Scappoose (OR0022420)	RM10.5796	Point Source	Water Temperature	DEQ	Located on the Multnomah Channel; 3/week daily maximum.
Wacker Siltronics (OR0030589)	6.6/84	Point Source	Water Temperature	DEQ	Daily Temperature.
Blue Heron Paper Mill (OR0000566)	26.4/2	Point Source	Water Temperature	DEQ	Flow set to zero - Permit active but no discharge.
Tri-City WWTP (OR0031259)	25.5/6	Point Source	Water Temperature	DEQ	Daily Maixumum.
Tryon Creek WWTP (OR0026891)	20.4/35	Point Source	Water Temperature	DEQ	Daily Temperature.
Oak Lodge WWTP (OR0026140)	20.2/36	Point Source	Water Temperature	DEQ	Daily Temperature.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Oregon Steel Mill (OR0000451)	2.8/92	Point Source	Water Temperature	DEQ	Daily Temperature.
Kellogg Creek WWTP (OR0026221)	18.7/47	Point Source	Water Temperature	DEQ	Daily (May 1 - Oct 31), Continuous.
Oregon Museum of Science and Industry (OR0034371)	13.5/62	Point Source	Water Temperature	DEQ	Bi-weekly Temperature.
Lewis River: Cedar Creek near Ariel, WA (14220500), East Fork of the Lewis River near Heisson, WA (14222500), and Lewis River at Ariel, WA (14220500)	87.20/265	Tributary	Flow	Derived data. USGS & Washington Ecology	Total basin flow estimated as the sum of the long-terms flows available from Lewis River at Ariel and the East Fork of the Lewis River station plus the estimated base flows from Cedar Creek as outlined in Sinclair and Pitz, 1999 (Washington Ecology). 2001 and 2002 both uses same monthly baseflow estimates for Cedar Creek from report.
Kalama River below Italian Creek near Kalama, WA (14223500)	73/301	Tributary	Flow	USGS	No data; From Sinclair and Pitz, 1999 (Washington Ecology). 2001 and 2002 both uses same monthly baseflow estimates from report.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Cowlitz River basin flow: Coweman River station near Kelso (14245000), Cowlitz River at Castle Rock, WA (14243000), and Delameter Creek station near Castle Rock (14243500)	67.33/428	Tributary	Flow	Derived data. USGS & Washington Ecology	No data were available for Delameter Crk and Coweman River. Total basin flow estimated as the sum of the long-terms flows available from Cowlitz River at Castle Rock plus the estimated base flows from Delameter Creek & Coweman River (Sinclair and Pitz, 1999 -Washington Ecology). 2001 and 2002 both uses same monthly baseflow estimates for Delameter and Coweman from report.
Grays-Elokoman basin: Abernathy Creek near Longview (14246000), WA and Mill Creek near Cathlamet, WA (14246500)	54/346	Tributary	Flow	Derived data. USGS & Washington Ecology	Total basin flow estimated as the sum of base flows from Abernathy Creek & Mill Creek. From Sinclair and Pitz, 1999 (Washington Ecology). 2001 and 2002 both uses same monthly baseflow estimates from report.
Clackamas River near Oregon City, OR (14211010)	24.85/7	Tributary	Flow	USGS	
Johnson Creek at Milwaukie, OR (14211550)	18.5/49	Tributary	Flow	USGS	

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Washougal River: Washougal River near Washougal, WA (14143500) and Little Washougal River near Washougal, WA (14144000)	120.75/191	Tributary	Flow	Derived data. USGS & Correlations	No data; Existing correlations to estimate flows and add resulting flows: Correlation relating daily flows in the East Fork of the Lewis River (14222500) with daily flows in the Washougal River; Correlation relating daily flows in the East Fork of the Lewis River (14222500)with daily flows in the Little Washougal River Near Washougal.
Sandy River below the confluence with the Bull Run River (14142500)	120.25/192	Tributary	Flow	USGS	
Columbia Slough at Portland, OR (14211820)	1/96	Tributary	Flow	USGS	
Lewis River (WDOE 27D090)	87.20/265	Tributary	Water Temperature	USGS & Washington Ecology	No data; Previously East Fork of the Lewis River (27D090) data from 7/25/2001 to 10/1/2001was used to represent the temperatures for the whole Lewis River.
Kalama River (WDOE 27B070)	73/301	Tributary	Water Temperature	Washington Ecology	

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Cowlitz River at Kelso (WDOE 26B070)	67.33/428	Tributary	Water Temperature	USGS & Washington Ecology	
Grays-Elokoman	54/346	Tributary	Water Temperature	Derived data. USGS & Washington Ecology	No data; Cowlitz River temperature data was used for 2001/2002.
Clackamas River near Oregon City, OR (14211010)	24.85/7	Tributary	Water Temperature	USGS	
Johnson Creek at Milwaukie, OR (14211550)	18.5/49	Tributary	Water Temperature	USGS	
Washougal River	120.75/191	Tributary	Water Temperature	Derived data. USGS & Correlations	No data; Cowlitz River temperature data was used for 2001/2002.
Sandy River (10674-ORDEQ and PWB_SR_US_BR)	120.25/192	Tributary	Water Temperature	USGS	Previously LASAR 11780 Sandy River at Dabney Bridge and LASAR 10674 Sandy River at Troutdale Bridgewere used for 2001/2002; More recent data for 2015 is available from 10674-ORDEQ (6 samples per year from 2/7/2008 to 12/16/2019) and PWB_SR_US_BR (8/11/2015 to 10/24/2018).
Columbia Slough at Portland, OR, N Vancouver St Bridge (Main Channel - Columbia Slough) (VNB)	1/96	Tributary	Water Temperature	City of Portland	2015 data is only available for a few months and is not available from May through Oct. Data from other years will be used to fill in gaps.

Model Location Name (Station ID)	Model River Mile /Segment Number	Input Type	Model Input	Data Source	Note
Columbia River at Bonneville Outflow (USACE BON)	144.5/118	Upstream Boundary	Flow	USACE	Also Columbia River below Bonneville Dam; USGS 14128870 (only has gage height).
Columbia River at Vancouver, WA (14144700)			Water Level	NOAA/USGS	Water Level used in correlation developed by Rodriquez, et al. (2001) to fill the gap as noted in PSU report.
Longview, WA (9440422)			Water Level	NOAA	Water Level used in correlation developed by Rodriquez, et al. (2001) to fill the gap as noted in PSU report.
Portland International Airport (WBAN 24229)	Waterbody 1 and Waterbody 2	Meteorological	Air Temperature, Cloudiness, Dew Point Temperature, Relative Humidity, Wind Direction, Wind Speed	NCDC/LCD & University of Oregon, Solar Radiation Monitoring Lab (SRML)	Solar Radiation (global) from SRML Gladstone site.

Hourly meteorology inputs into the model include air temperature, cloudiness, dew point temperature, relative humidity, wind direction, and wind speed. Air temperature data may be modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds may be adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade inputs reflect the vegetation conditions in the early 2000s.

6.10.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period.

Hydrodynamic calibration data are available during 2015 for each of the six water level observation and one flow calibration station used during 2001/2002. Out of the 17 water temperature stations used previously in 2001/2002, only 3 stations have data during the years 2015 and/or 2016. Several of the water temperature stations were from Oregon's Laboratory Analytical Storage and Retrieval Database (LASAR) and have an associated ID which is similar to the LASAR but only have data during either 2001 and/or 2002 but no data collected during 2015 and/or 2016.

The current condition calibration parameters (i.e., from 2001/2002) may need to be updated in the 2015 model to reflect spawning period conditions. Potential calibration adjustments may be made to Manning's coefficient, wind sheltering, evaporation, and sediment temperatures. Vegetative and topographic shade characteristics will not be adjusted since the model input was developed using a detailed GIS analysis. The model calibration location and available data during the year 2015 are shown below in Table 36.

Table 36: Calibration sites and parameters used in the Willamette River: Lower Heat Source model.

Model Location Name (Station ID)	Model River Mile /Segment Number	Calibration Parameter	Data Source	Note
Columbia at Beaver Army Terminal (14246900)	53.00/347	Flow	USGS	
Columbia at Beaver Army Terminal (14246900)	53/347	Water Temperature	USGS	No Data; Data extends only up to 9/30/2003.
Columbia River at Longview, WA (14245300; also 9440422 Longview, WA)	66.20/315	Water Level	USGS/NOAA	USGS 14245300 used for 2001/2002 does not have any data. Use 9440422 Longview, WA which is at the same location.
Columbia River at St. Helens, OR (ACOE SHNO3)	85.75/270	Water Level	NOAA/NWS	
Columbia River at Vancouver, WA (14144700)	106.50/223	Water Level	USGS	
Columbia River below Bonneville Dam, OR (14128870)	144.50/118	Water Level	USGS	
Columbia River Left bank, at Dodson OR (Warrendale) (453630122021400)	140.40/134	Water Temperature	USGS	

Model Location Name (Station ID)	Model River Mile /Segment Number	Calibration Parameter	Data Source	Note
Columbia River Right Bank at Washougal, WA (453439122223900)	121.75/188	Water Temperature	USGS	
Willamette at Portland, OR (14211720)	12.70/66	Water Temperature, Water Level	USGS	
Willamette below Willamette Falls (14207770)	26.48/2	Water Level	USGS	

6.11 Willamette River: Middle

The Willamette River: Middle model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USGS. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by Portland State University (Annear et al., 2004; Berger et al., 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.11.1 Model domain

The extent of the model domain is the Willamette River at Willamette Falls in Oregon City (RM 26.8) to Salem, Oregon (RM 85.4). The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.11.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except where necessary for stability and to improve model run times. The current model uses three waterbodies and six branches. The model grid has 407 segments, with segment length ranging between 250.2 meters and 268.2 meters.

6.11.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the Willamette River: Middle include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by upstream dams (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are 15 permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 37.

Table 37: Summary of individual NPDES permitted discharges in the Willamette River: Middle.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Blue Heron Paper Co. (72634)	45.3562/-122.61	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 27.8
Brooks Sewage Treatment Plant (100077)	45.044/-122.965	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 71.7
Canby Regency Mobile Home Park (97612)	45.2924/-122.652	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 31.6
Canby STP (13691)	45.2886/-122.681	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 33
Century Meadows Sanitary System (Cmss) (96010)	45.2656/-122.825	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 42.8
Covanta Marion, Inc (89638)	45.0493/-122.964	NPDES-IW-B16: All facilities not elsewhere classified which dispose of non-process wastewaters	Willamette River RM 72
Dundee STP (25567)	45.281/-123.013	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 51.7
Forest Park Mobile Village (30554)	45.3382/-122.641	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 28.2
Newberg - Wynooski Road STP (102894)	45.2864/-122.953	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 49.7
ODOT - Statewide Stormwater MS4 (110870)	44.89/-122.92	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Willamette River RM 84.3
Salem Willow Lake STP (78140)	45.0097/-123.055	NPDES-DOM-A2: Sewage - 25 MGD or more but less than 50 MGD	Willamette River RM 78.4
Salem, City Of, Municipal Stormwater MS4 (108919)	44.9228/-122.983	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Willamette River RM 84
West Linn Paper Company (21489)	45.3564/-122.615	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 27.5
Westrock, Newberg Mill (72615)	45.2891/-122.961	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 49.7
Wilsonville STP (97952)	45.2949/-122.772	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Willamette River RM 38.5

The majority land uses along the Willamette River: Middle are agriculture and forestry accounting for about 76 percent of the near-stream area. Table 38 summarizes all the land uses within 300 meters of the digitized Willamette River: Middle centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 38: Summary of land uses within 300 meters of the digitized Willamette River: Middle centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Cultivated Crops	3256.3	23.7
Hay/Pasture	2888.5	21.1
Woody Wetlands	2463.0	18.0
Emergent Herbaceous Wetlands	957.4	7.0
Developed, Low Intensity	852.4	6.2
Evergreen Forest	834.0	6.1
Developed, Open Space	628.5	4.6
Shrub/Scrub	452.8	3.3
Developed, Medium Intensity	404.5	2.9
Mixed Forest	320.9	2.3
Barren Land	250.6	1.8
Developed, High Intensity	227.1	1.7
Herbaceous	158.8	1.2
Deciduous Forest	21.8	0.2

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 39).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 39 summarizes the potential designated management agencies and responsible persons along the Willamette River: Middle model extent.

Table 39: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized Willamette River: Middle centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Agriculture	7827.8	39
Oregon Department of State Lands - Waterway	5136.3	25.6
Oregon Parks and Recreation Department	1400.8	7

DMA or Responsible Person	Acres	Percent of Total Acres
City of Salem	983.2	4.9
City of West Linn	561.8	2.8
Polk County	445.9	2.2
City of Wilsonville	419.5	2.1
Marion County	413.1	2.1
Oregon Department of Transportation	364.6	1.8
Yamhill County	351.3	1.8
City of Oregon City	293.8	1.5
City of Keizer	266.1	1.3
Clackamas County	249.2	1.2
City of Independence	238.3	1.2
State of Oregon	235.8	1.2
Oregon Department of Forestry - Private Forestland	183.4	0.9
Oregon Department of Fish and Wildlife	138.7	0.7
City of Dundee	104.3	0.5
City of Canby	88.1	0.4
U.S. Bureau of Land Management	68.8	0.3
Union Pacific Railroad	68.8	0.3
City of Gladstone	65.7	0.3
Oregon Department of Geology and Mineral Industries	59.2	0.3
City of Newberg	53.3	0.3
Portland & Western Railroad	32.6	0.2
U.S. Government	13.2	0.1
City of McMinnville	9.1	<0.05
U.S. Fish and Wildlife Service	1.1	<0.05

6.11.4 Time frame of simulation

The model period is March 21, 2015 to October 31, 2015.

6.11.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions. Additional assumptions will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

6.11.6 Model inputs

Model inputs will be updated to reflect the stream flow rate, stream temperature, and meteorology conditions for the target calibration years of 2011, 2015, and 2016. The specific model input details will

be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade inputs reflect the vegetation conditions in the early 2000s.

6.11.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period. The specific model calibration details will be documented in a forthcoming USGS reported estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021). It is expected that some modeling parameters will be adjusted to improve model stability, decrease runtimes, improve model fit, and better reflect current conditions. Potential calibration adjustments may be made to the Manning's friction coefficient, slope, and the turbulence closure scheme. In some cases, adjustments may be made to the model grid and the configuration of various flow structures (e.g., spillways, pipes, gates, etc.).

6.12 Willamette River: Upper

The Willamette River: Upper model is a temperature model developed using CE-QUAL-W2 4.2. The model will be developed by USGS. The model is the most recent update in a series of CE-QUAL-W2 models that have been developed since the early 2000s. The original calibrated model used CE-QUAL-W2 version 3.12 and was developed for the 2006 temperature TMDL (DEQ, 2006) by Portland State University (Annear et al., 2004; Berger et al., 2004) and DEQ (DEQ, 2006). In 2007, USGS made several improvements to the temperature models (Rounds, 2007).

6.12.1 Model domain

The extent of the model domain is the Willamette River at Salem, Oregon (RM 85.4) upstream to the confluence of Coast and Middle Forks (approximately RM 187). The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix E.

6.12.2 Spatial and temporal resolution

The model input bathymetry and grid are not expected to be updated from the original model used in the 2006 TMDL (DEQ, 2006) except where necessary for stability and to improve model run times. The current model uses nine waterbodies and thirteen branches. The model grid has 667 segments, with segment length ranging between 250.12 meters and 251.22 meters.

6.12.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances along the Willamette River: Upper include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to the stream flow rate or volume, releases and management of water impounded by upstream dams (Rounds, 2010), and background sources (DEQ, 2006). Other potential sources include channel modification and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are 13 permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 40.

Table 40: Summary of individual NPDES permitted discharges in the Willamette River: Upper.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Adair Village STP (500)	44.6725/-123.214	NPDES-DOM-Da: Sewage - less than 1 MGD	Willamette River RM 122
Am WRF (1098)	44.643/-123.077	NPDES-DOM-Ba: Sewage - 5 MGD or more but less than 10 MGD	Willamette River RM 118
Cascade Pacific Pulp, LLC (36335)	44.3827/-123.16	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 147.7
Corvallis STP (20151)	44.5758/-123.255	NPDES-DOM-Ba: Sewage - 5 MGD or more but less than 10 MGD	Willamette River RM 130.8
Eugene, City Of, Municipal Stormwater MS4 (107989)	44.0614/-123.189	NPDES-DOM-MS4-1: Municipal Separate Storm Sewer System - Phase I	Willamette River RM 178
H&V - Corvallis (28476)	44.5538/-123.261	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 132.5
Halsey Mill (105814)	44.4034/-123.194	NPDES-IW-B01: Pulp, paper, or other fiber pulping industry.	Willamette River RM 147.7
Harrisburg Lagoon Treatment Plant (105415)	44.2902/-123.183	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 158.4
Independence STP (41513)	44.8583/-123.196	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 95.5
Monmouth STP (57871)	44.8583/-123.217	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Willamette River RM 95.5
MWMC - Eugene/Springfield STP (55999)	44.0961/-123.12	NPDES-DOM-A2: Sewage - 25 MGD or more but less than 50 MGD	Willamette River RM 178
Osu John L. Fryer Aquatic Animal Health Lab (103919)	44.5676/-123.245	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Willamette River RM 130.6
Springfield Municipal Stormwater, MS4 (84048)	44.0475/-123.018	NPDES-DOM-MS4-2: Municipal Separate Storm Sewer System - Phase II	Willamette River RM 1

The majority land uses along the Willamette River: Upper are agriculture and forestry accounting for about 64 percent of the near-stream area. Table 41 summarizes all the land uses within 300 meters of the

digitized Willamette River: Upper centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 41: Summary of land uses within 300 meters of the digitized Willamette River: Upper centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Hay/Pasture	3619.5	24.1
Cultivated Crops	3119.1	20.8
Woody Wetlands	2400.7	16.0
Emergent Herbaceous Wetlands	2252.4	15.0
Developed, Low Intensity	1039.5	6.9
Developed, Open Space	745.0	5.0
Developed, Medium Intensity	626.3	4.2
Developed, High Intensity	412.5	2.7
Barren Land	368.5	2.5
Herbaceous	143.2	1.0
Evergreen Forest	98.7	0.7
Mixed Forest	84.5	0.6
Shrub/Scrub	84.3	0.6
Deciduous Forest	18.9	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 42).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 42 summarizes the potential designated management agencies and responsible persons along the Willamette River: Upper model extent.

Table 42: Summary of potential designated management agencies (DMAs) or responsible persons within 300 meters of the digitized Willamette River: Upper centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Agriculture	7373.9	46
Oregon Department of State Lands - Waterway	2047	12.8
City of Eugene	1419.5	8.8
Oregon Parks and Recreation Department	1297.9	8.1
Lane County	1061.2	6.6

DMA or Responsible Person	Acres	Percent of Total Acres
City of Corvallis	616	3.8
City of Albany	513.4	3.2
Oregon Department of Transportation	375	2.3
City of Springfield	364.2	2.3
City of Millersburg	207.8	1.3
Linn County	195.3	1.2
City of Harrisburg	149.8	0.9
U.S. Fish and Wildlife Service	118.5	0.7
Benton County	96.3	0.6
Oregon Department of State Lands	89.5	0.6
Union Pacific Railroad	40.9	0.3
U.S. Bureau of Land Management	28.5	0.2
Portland & Western Railroad	22.4	0.1
Central Oregon & Pacific Railroad	9.3	0.1
U.S. Government	6.8	<0.05
City of Adair Village	4.6	<0.05
State of Oregon	2.6	<0.05
Oregon Department of Forestry - Private Forestland	1.8	<0.05

6.12.4 Time frame of simulation

The model period is March 21, 2015 to October 31, 2015.

6.12.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented by Annear et al. (2004), Berger et al. (2004), DEQ (2006), and Rounds (2007). Setup and calibration of the updated model may rely upon many of the same assumptions. Additional assumptions will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

6.12.6 Model inputs

Model inputs will be updated to reflect the stream flow rate, stream temperature, and meteorology conditions for the target calibration years of 2011, 2015, and 2016. The specific model input details will be documented in a forthcoming USGS report estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021).

The shade and topographic inputs to the model were developed by DEQ (DEQ, 2006). These inputs were derived by digitizing and classifying near stream vegetation using aerial photos. The shade inputs reflect the vegetation conditions in the early 2000s.

6.12.7 Model calibration

Model calibration will focus on flow, water level, and water temperature data from calibration sites that have available data during the simulation period. The specific model calibration details will be documented in a forthcoming USGS reported estimated to be published in 2022 (L. Stratton, personal communication, October 26, 2021). It is expected that some modeling parameters will be adjusted to improve model stability, decrease runtimes, improve model fit, and better reflect current conditions. Potential calibration adjustments may be made to the Manning's friction coefficient, slope, and the turbulence closure scheme. In some cases, adjustments may be made to the model grid and the configuration of various flow structures (e.g., spillways, pipes, gates, etc.).

7 Model evaluation and acceptance

7.1 Model uncertainty and sensitivity

Model uncertainty can arise from a number of sources including error associated with measuring field parameters used for model input or calibration, lack of knowledge on the appropriate value to use for model parameters or constants, or an imperfect mathematical formulation in the model of real world physical processes. A model's sensitivity is the degree to which predictions are affected by changes in a single or multiple input parameters.

In many cases, the major source of uncertainty is due to uncertainty in spatial representation of the river channel and adjacent landcover (e.g., bathymetry, vegetation height and density) from lack of data or simplification, configuration of the boundary conditions (e.g., uncertainty in estimation of ungaged tributary flows or temperatures), and uncertainty from limited amount or spatial distribution of observed data used for calibration. These sources of uncertainty are largely unavoidable, but do not invalidate the use of the model for decision purposes.

During the calibration process, it is good practice to evaluate and minimize uncertainty associated with the model parameters to the greatest extent practical (Beck, 1987; EPA, 2009). During the model calibration process, the responsiveness of the model predictions to various assumptions and rate constants should be evaluated. The model setup should include parameters based on literature recommendations and best professional judgment.

Reducing uncertainty in measured field parameters used for model input and calibration is accomplished in the following ways:

- Data used for the TMDL must have been collected based on a project plan with quality assurance and quality control protocols for collecting and analyzing samples.
- The sampling and laboratory analysis must follow widely accepted scientific methods and protocols. These may include DEQ's Mode of Operations Manual (DEQ, 2020), USEPA's methods (EPA, 1983), USGS's published techniques of water-resources investigations, the USGS National Field Manual, or Standard Methods for the Examination of Water and Wastewater. All acceptable methods include applicable precision and accuracy checks.

- When possible, accuracy and precision should be evaluated using DEQ's data validation criteria as outlined in DEQ Data Quality Matrix for Field Parameters (DEQ, 2013). The TMDL program uses waterbody results that demonstrate a data quality level of A, B, or E with careful review (DEQ, 2021). For continuous temperature data a data quality of A or B corresponds to an absolute accuracy 1.0 deg-C and absolute precision 2.0 deg-C. Data of unknown quality lacking audit and pre and post accuracy checks may also be used following a careful review where it is determined the results appear reasonable and free of issues based on professional judgment.

Uncertainties in the mathematical formulation are addressed by using open source models that allow free and transparent inspection of model code, and models that have had their methodologies peer reviewed and evaluated.

A sensitivity analysis was completed for the set of models used in the 2006 TMDL (DEQ, 2006). A discussion of the methodology and results of the sensitivity analysis are found in the 2006 TMDL (DEQ, 2006). It is not anticipated that additional uncertainty or sensitivity analyses will be performed on the updated calibrated models.

It is not anticipated that additional uncertainty or sensitivity analyses will be performed on the existing calibrated models.

7.2 Model acceptance

This section identifies the model acceptance criteria. Model acceptance relies on satisfying seven (7) conditions:

1) Incorporation of all available field observations of the system (e.g., geometry, flow, boundary inputs/withdrawals, and meteorology) for the time period simulated.

2) Model parameters and unmeasured boundary conditions that are within literature-supported and physically defensible ranges.

3) Model predicted results have been compared with the associated observed measurements using graphical presentations. Visual comparisons are useful in evaluating model performance over the appropriate temporal or spatial scales.

4) Goodness of fit statistics have been calculated comparing the model predicted results to the associated observed measurements. The calibration goodness of fit statistics are shown in Equation 4 through Equation 8.

5) Goodness of fit statistics have been used to inform the appropriate use of the model. Where a model achieves an excellent or good fit it can generally assume a strong role in decision making about appropriate management options. Conversely, where a model achieves only a fair or poor fit it should assume a much less prominent role in decision making about appropriate management options. If a desired level of quality is not achieved on some or all measures, the model might still be useful; however, a detailed description of its potential range of applicability will be provided.

6) Written documentation of all important elements in the model, including model setup, model parameterization, key assumptions, and known areas of uncertainty.

7) Peer review as described in Section 9.

Equation 5 through Equation 8 are the goodness of fit statistics to be calculated for each calibrated temperature model. Equation 4 through Equation 7 are the goodness of fit statistics to be calculated for each calibrated shade model.

Coefficient of Determination – R squared (R^2): A coefficient of determination, or R^2, of one indicates a perfect fit. R^2 is a measure of how well predicted values fit the observed data. It compares the variations in the residuals to the variation of the observed data.

$$R^2 = 1 - \frac{\sum(X_{obs} - X_{mod})^2}{\sum\left(X_{obs} - \overline{X_{obs}}\right)^2} \qquad \text{Equation 4}$$

Mean Error (ME): A mean error of zero indicates a perfect fit. A positive value indicates on average the model predicted values are less than the observed data. A negative value indicates on average the model predicted values are greater than the observed data. The mean error statistic may give a false ideal value of zero (or near zero) if the average of the positive deviations between predictions and observations is about equal to the average of the negative deviations in a data set. Because of this, the mean absolute error (MAE) statistic should be used in conjunction with mean error to evaluate model performance.

$$ME = \frac{1}{n}\sum(X_{mod} - X_{obs}) \qquad \text{Equation 5}$$

Mean Absolute Error (MAE): A mean absolute error of zero indicates a perfect fit. The magnitude of the mean absolute error indicates the average deviation between model predicted values and observed data. The mean absolute error cannot give a false zero.

$$MAE = \frac{1}{n}\sum|X_{mod} - X_{obs}| \qquad \text{Equation 6}$$

Root Mean Square Error (RMSE): A root mean square error of zero indicates a perfect fit. Root mean square error is a measure of the magnitude of the difference between model predicted values and observed data.

$$RMSE = \sqrt{\frac{1}{n}\sum(X_{mod} - X_{obs})^2} \qquad \text{Equation 7}$$

Nash-Sutcliffe efficiency coefficient (NS): Nash-Sutcliffe efficiencies can range from -∞ to 1. An efficiency of 1 corresponds to a perfect match of modeled predicted value to the observed data. An efficiency of 0 indicates that the model predictions are as accurate as the mean of the observed data, whereas an efficiency less than zero occurs when the observed mean is a better predictor than the model.

$$NS = 1 - \frac{\sum(X_{obs} - X_{mod})^2}{\sum\left(X_{obs} - \overline{X_{obs}}\right)^2} \qquad \text{Equation 8}$$

where,
X_{mod} = The model predicted results;
X_{obs} = The observed or measured results;
$\overline{X_{obs}}$ = The mean of the observed or measured temperature;
n = The sample size.

8 Documentation in model reports

Model documentation will consist of a series of TMDL technical appendices describing the model setup, model calibration results, model scenario setup, and model scenario results.

The model setup and calibration documentation will include details on the calibrated model domain and layout; spatial and temporal resolution; timeframe of simulation; summary of data used for model inputs; summary of methods used to fill data gaps; summary of data used for calibration; time series plots comparing observed and model predicted temperatures and other parameters as appropriate; goodness-of-fit statistics, and plots and tables summarizing temperature and effective shade model results.

The model scenario setup and scenario results documentation will include a description of the scenario, what model elements were modified for the scenario; tables, plots, or narrative summarizing the final values for any modified inputs or parameters; methods or data sources used to setup the scenario; and plots and tables that summarize the scenario results.

When no changes or minor changes are made to the existing TMDL models, the existing TMDL technical appendices will be amended as necessary to document any changes to the existing calibration or management scenarios. For more extensive changes or entirely new models new technical appendices may need to be developed to document the models and results.

9 Peer review

Peer review of the models and model results will be conducted in the following ways:

DEQ will conduct internal peer review during the modeling process with input from USEPA Region 10 as needed. For models being developed by USEPA's contractor, Tetra Tech, USEPA and DEQ will peer review all contractor developed models and model documentation.

DEQ will consider feedback on model scenarios and results from the TMDL advisory group and make changes as appropriate.

DEQ will review and respond to any public comments received on the model and model results, and make changes as appropriate.

10 Management scenarios

Management scenarios described in this section summarize the means by which the current conditions and other alternatives will be evaluated. Some of these model scenarios may not be developed due to lack of sufficient data and information, because the management scenario is not applicable to the specific waterbody, or because it is determined the scenario will require an effort and timeline that does not align with the project schedule or available resources. In some cases, the management scenario has already

been developed as part of the previous TMDL and does not need further adjustment. DEQ will review all available data and information during model development and document final model scenario decisions, setup, and results in the TMDL technical appendix.

10.1 Background

This scenario evaluates the stream temperature response from background sources only. Background sources include all sources of pollution or pollutants not originating from human activities. Background sources may also include anthropogenic sources of a pollutant that DEQ or another Oregon state agency does not have authority to regulate, such as pollutants emanating from another state, tribal lands, or sources otherwise beyond the jurisdiction of the state (OAR 340-042-0030(1)). This scenario essentially combines the following model scenarios: restored vegetation, restored stream flow, and potentially elements of the climate scenario. The background scenario will be compared to the current conditions model scenario to determine the point of maximum impact, and the amount of cumulative warming originating from human activities that DEQ or another Oregon state agency have authority to regulate. Restored channel morphology will likely not be included in the background scenario. DEQ explored the methods and data necessary to develop such a scenario with the USGS and concluded the amount of time and resources required do not align with the available project resources or schedule.

10.2 Restored vegetation

This scenario evaluates the stream temperature response with streamside vegetation at restored conditions. The stream temperature warming or cooling contributed by removal of streamside vegetation is evaluated by comparing this scenario to the current condition model. Elements of this scenario or scenarios may include:

- Restoring streamside vegetation in areas along the model extent that are currently characterized as lacking streamside vegetation because of anthropogenic disturbance. The restored vegetation type, height, density, and overhang values will be determined during the TMDL process and will likely be the same or similar to the values presented in the Willamette Basin TMDL and WQMP.
- Shade inputs will reflect the restored vegetation conditions and will likely be based on the shade files used for the model developed for the 2006 TMDL (DEQ, 2006).
- All other model inputs will be the same as the current condition model.

10.3 Restored stream flow

This scenario evaluates the stream temperature response to withdrawals of instream flow. The stream temperature warming or cooling is evaluated by comparing this scenario to the current conditions model scenario. Assumptions and methods used to estimate restored stream flow will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Maintaining all currently permitted water withdrawals as instream flow in order to increase the thermal loading capacity and reduce stream warming.
- Model boundary and tributary flows will be set to reflect the additional instream flows.
- All other model inputs will be the same as the current condition model.

10.4 Tributary temperatures

This scenario evaluates the stream temperature response from restoration actions on tributaries. The stream temperature warming or cooling contributed by removal of streamside vegetation on tributaries is evaluated by comparing this scenario to the current condition model. Assumptions and methods used to estimate restored tributary conditions will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Tributary inputs will be set to reflect restored temperature and flow conditions. The tributary flow will reflect maintaining all currently permitted water withdrawals as instream flow.
- All other model inputs will be the same as the current condition model.

10.5 Climate

This scenario evaluates the stream temperature response from changes in air temperature and relative humidity connected to human caused changes to global or micro climate conditions. Warming or cooling from climate related impacts will be evaluated by comparing this scenario to the current conditions model scenario. Assumptions and methods used to develop this scenario will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Model inputs for air temperature and relative humidity may be modified to reflect potential conditions or conditions without climate change impacts assuming enough information exists that would allow downscaling to the site specific conditions in model extent.
- Model inputs for groundwater or stream flow may also be modified if sufficient information exists that would allow downscaling to the site specific conditions in model extent.
- All other model inputs will be the same as the current condition model.

10.6 No point sources

This scenario evaluates the stream temperature response from removing point source heat load. The stream temperature warming or cooling from permitted NPDES point sources is evaluated by comparing this scenario to the current conditions model scenario. Elements of this scenario or scenarios may include:

- Removal of all point sources from the model.
- All other model inputs will be the same as the current condition model.

10.7 TMDL wasteload allocations

This scenario evaluates stream temperature warming or cooling from the TMDL wasteload allocations. These scenarios will be compared to the background model scenario to evaluate attainment of the human use allowance allocations. Numeric or narrative wasteload allocations will be developed for all NPDES permittees but some of the permittees may not be included in this model scenario due to availability of effluent data, lack of discharge, or because the discharge is not a significant source or thermal loading. Elements of this scenario or scenarios may include:

- Modifying point source discharges to reflect proposed or existing TMDL wasteload allocations. Boundary condition stream flow rates may also be modified in order to evaluate TMDL wasteload allocation during critical low flows (e.g., 7Q10).

- All other model inputs will be the same as the background model scenario.

10.8 TMDL implementation plans

This set of scenarios evaluate the stream temperature response from proposed or existing DMA and responsible person management plans, TMDL implementation plans, or rules. These scenarios will be compared to the background model scenario to evaluate attainment of the human use allowance allocations or surrogate measures. It is likely that multiple model scenarios will be developed evaluating a single implementation plan or multiple implementation plans together. Assumptions and methods used to develop this scenario will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Modifying streamside vegetation, instream flow, and/or channel morphology to reflect the proposed or existing implementation plan. Translating the plan elements to the modeled landscape conditions will be determined during the TMDL process.

- Model inputs for land cover height, density, overhang, boundary condition flow and temperature, channel width, bank angle, Manning's n, porosity, percent hyporheic flow, and hyporheic zone thickness, may be modified.

- All other model inputs will be the same as the background model scenario.

DEQ may also rely upon the results of relevant studies, reports, or published articles to supplement the model scenario; or as the primary source of information for locations or situations where the model results are not applicable.

10.9 No dams

In 2010, the USGS developed a no dam model scenario and evaluated the thermal effects of dams in the Willamette River mainstem and major tributaries (Rounds, 2010). The scenario estimated the flow rates and stream temperatures at each dam assuming a free flowing no dam condition. The updated flow and temperatures were input to the model boundary conditions. The scenario utilized the CE-QUAL-W2 models developed for the 2001 and 2002 model year. The analysis included 13 USACE dams and PGE's River Mill dam on the Clackamas River. Other dams were excluded from the analysis. Warming or cooling from releases and management of water impounded by these dams was evaluated by comparing the no dam scenario to the current conditions model scenario. At this time DEQ does not expect to repeat or update the no dam modeling analysis for the updated calibration period as the USGS analysis provides sufficient information on the temperature impact of the dams.

11 Project organization

11.1 Project team/roles

Project roles and responsibilities are described in Table 43.

Table 43: The roles and responsibilities of each team member involved in the temperature TMDL replacement project.

Name	Position	Role and Responsibilities
Jennifer Wigal	Water Quality Administrator, Oregon DEQ	Sponsor 1. Provide guidance to team and project manager 2. Approve project plan and changes to the project, scope, budget, and schedule (pending manager elevation as necessary) 3. Sustain support of decision makers at their level, all stakeholders 4. Remove roadblocks 5. Communicate progress to other managers and WQ Director 6. Review project status 7. Manage resistance 8. Ensure communication with employees affected by changes 9. Provide forum to listen to concerns
Gene Foster	Manager, Watershed Management, Oregon DEQ	Manager 1. Review and approve team work products 2. Communicate progress to other managers 3. Approve project plan, changes to the project, and any changes that affect scope and schedule 4. Approve development and finalization of solutions to issues that occur during the project 5. Decide measures of project success
Michele Martin	Project Manager, Water Quality, Oregon DEQ	Project Manager 1. Facilitate meetings, effective meeting management 2. Provide feedback and leadership in the development of meeting agendas, activities during meetings, and tasks. 3. Provide feedback on project planning and design 4. Keep sponsor informed 5. Develop project charter 6. Develop project plan (including major tasks, milestones, project schedule, communication

Name	Position	Role and Responsibilities
		plan, risk analysis, etc.) 7. Develop team meeting agendas 8. Keep track of meeting decisions and notes (very brief), and team ideas 9. Ensure team's work drives towards outcomes and deliverables 10. Sustain engagement of team members and team performance 11. Control project scope (with Technical Lead) 12. Coordinate team communication: Emails, SharePoint, shared drives 13. Closeout project and document lessons learned
Ryan Michie	Senior Water Quality Analyst, Watershed Management, Oregon DEQ	Project Technical Lead 1. Lead, oversee, and direct development of the project QAPP 2. Lead, oversee, and direct the public data solicitation process 3. Coordination with EPA and Contractor 4. Lead, oversee, and direct DEQ technical staff 5. Perform model calibration/evaluation 6. Run model scenarios 7. Analyze and interpret model results 8. Lead, oversee, and direct TMDL document writing 9. Participate and present at TMDL public meetings 10. Respond to public comments
Jim Bloom	Senior Water Quality Analyst, Watershed Management, Oregon DEQ	1. Develop and configure models 2. Perform model calibration/evaluation 3. Run model scenarios 4. Analyze and interpret model results 5. Write TMDL 6. Participate and present at TMDL public meetings 7. Respond to public comments
David Fairbarin	Water Quality Analyst, Watershed Management, Oregon DEQ	1. Write QAPP 2. Develop and configure models 3. Perform model calibration/evaluation 4. Run model scenarios 5. Analyze and interpret model results 6. Write TMDL 7. Participate and present at TMDL public

Name	Position	Role and Responsibilities
		meetings 8. Respond to public comments
Yuan Grund	Water Quality Analyst, Watershed Management, Oregon DEQ	1. Write QAPP 2. Perform data evaluation 3. Run model scenarios 4. Analyze and interpret model results
Andrea Matzke; Nancy Gramlich; Roxy Nayar; Priscilla Woolverton	Basin Coordinators, Oregon DEQ	1. Review QAPP and TMDL 2. Write WQMP 3. TMDL Advisory Committee coordinator 4. Participate and present at TMDL public meetings 5. Respond to public comments
Chris Moore	DEQ QAPP Officer, Oregon DEQ	Review QAPP
Dianne Lloyd	Oregon Department of Justice	Legal Counsel
Rob Burkhardt	Water Quality Specialist, Oregon DEQ	Project team point of contact to NPDES permit program and permittees Review wasteload allocations
Tetra Tech	Contractor	TMDL development support
Claire Schary	EPA Region 10	Non-technical TMDL reviewer
Ben Cope	EPA Region 10 QAPP Officer for Modeling Projects	EPA Modeling Lead 1. Review QAPPs 2. Review EPA Contractor work products
Jayshika Ramrakha	EPA Region 10 EPA Task Order Manager	Direct EPA Contractor
TMDL Advisory Committee	Each TMDL will have a local, public advisory committee	1. Participate in TMDL Advisory Committee Meetings 2. Provide input to DEQ on TMDL and WQMP elements

11.2 Expertise and special training requirements

Additional expertise or special training is not necessary at this time.

DEQ staff involved in developing and configuring models, performing model calibration, running model scenarios, and analyzing and interpreting model results have experience in these tasks from numerous other modeling projects. The Project Manager has extensive experience managing large complex projects and will ensure strict adherence to the project protocols.

11.3 Reports to management

The DEQ Project Manager (or designee) will provide progress reports to DEQ Management and USEPA as needed based on new project information. As appropriate, these reports will provide information on the following:

- Adherence to project schedule and/or budget.
- Deviations from approved QAPP, as determined from project assessment and oversight activities.
- The impact of any deviations on model application quality and uncertainty.
- The need for and results of response actions to correct any deviations.
- Potential uncertainties in decisions based on model predictions and data.
- Data quality assessment findings regarding model input data and model outputs.

11.4 Project schedule

The project schedule for the Willamette River mainstem and major tributaries QAPP project area TMDL is scheduled to occur in two phases. The pre TMDL project phase, and the TMDL and WQMP development phase.

Pre TMDL project phase

The pre TMDL project phase will generally occur between January 2020 through the end of August 2022. In this phase most of the planning and technical work occurs. Specific tasks include:

Task P1 Data gathering and project organization.

P1.1 Organize and gather effluent data from all active NPDES permittees in the temperature TMDL replacement project area.

P1.2 Organize and gather all available and relevant river temperature, stream flow, habitat, effective shade, and channel morphology.

P1.3 Complete an open data solicitation. During the solicitation period, the public may submit continuous stream temperature data and NPDES effluent data to DEQ in the watersheds subject to the temperature TMDL replacements.

P1.4 Review data collected. Data submitted to DEQ will be screened for completeness and quality, and whether the results are within the typical range expected for that season and time of day.

P1.5 Stream temperature data will be made available in DEQ's Ambient Water Quality Monitoring System database (AWQMS).

Task P2 Develop modeling Quality Assurance Project Plans (QAPPs). The modeling QAPPs will identify the available data and overall technical approach to be taken for each TMDL project.

Task P3 Mapping of Designated Management Agencies (DMAs) and Responsible Persons for counties that are within the project area. All Oregon counties are within the project area except Tillamook, Clatsop, and Deschutes counties.

Task P4 Development of computer code to streamline analysis tasks and TMDL document production.

Task P5 Development of template TMDL and WQMP section outlines and language.

Task P6 Implement Modeling QAPPs. This task is a follow-up to Task P2. Gathering of new data and completion of new technical work described in the modeling QAPPs.

TMDL and WQMP development phase

The TMDL and WQMP development phase is scheduled to begin in 2023 with USEPA's final agency action approving or disapproving of the TMDL no later than February 28, 2025. In this phase, the draft TMDL and WQMP documents will be written; a TMDL advisory committee will be convened to discuss the updated TMDL allocations, any revisions to the WQMP, and potential fiscal impacts in the case of a rulemaking process; and finally DEQ will conduct a public comment period. DEQ will respond to all public comments received, revise the TMDL and WQMP as necessary, and issue the final TMDL to USEPA for their action.

12 Data management

DEQ does not anticipate collecting additional field samples. Water quality data gathered and used for this project will be managed in DEQ's AWQMS database or the project files.

The modeling software to be used for this project is available on DEQ's TMDL program website (https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Tools.aspx).

Model-generated data resulting from testing, calibration, and scenarios will be stored in spreadsheets and text files by DEQ in the TMDL project directory. Metadata describing the content, date, and personnel involved in modeling will be documented alongside raw and summarized data.

Secondary data developed as part of this task will be maintained as hardcopy only, both hardcopy and electronic, or electronic only, depending on their nature.

All electronic data will be maintained on DEQ's computers and servers. DEQ's computers are serviced by in-house specialists. When a problem with DEQ's computers and servers occurs, in-house computer specialists diagnose the problem and correct it if possible. When outside assistance is necessary, the computer specialists call the appropriate vendor. For other computer equipment requiring outside repair and not covered by a service contract, local computer service companies are used on a time-and-materials basis.

Routine maintenance of DEQ's computers and servers is performed by in-house computer specialists. Electric power to each computer flows through a surge suppressor to protect electronic components from potentially damaging voltage spikes. All computer users have been instructed on the importance of routinely archiving work assignment data files from hard drive to server storage. The office network server is backed up on tape nightly during the week. Screening for viruses on electronic files loaded on DEQ's computers or the network is standard policy. Automated screening systems have been placed on all computer systems and are updated regularly to ensure that viruses are identified and destroyed. Annual maintenance of software is performed to keep up with evolutionary changes in computer storage, media, and programs.

13 Recordkeeping and archiving

All data and documents generated during the course of the TMDL project will be archived according to the current Oregon State Archives Records Retention Schedules. Generally TMDL documents will be retained until 15 years after the TMDL is no longer operational.

Records that are stored in electronic format will be located in either the TMDL project folder or Master TMDL folder located on DEQ's TMDL server. The TMDL project folder will contain at minimum the following subfolders: "Project Plans", "Data", "Models", and "Meetings". Alternative names and additional subfolders can be used as appropriate. The Master TMDL folder will contain the written TMDL documents (Word, PDF) along with supporting written documents that support the public comment period and TMDL issuance. The contents and organization of these subfolders is described below.

Project Plans: All documents related to project planning, project proposals, project schedules, and the modeling QAPPs. Each will reside in their relevant subfolders. The final versions of documents will be clearly identified from drafts and ideally located in separate folders.

Data: All field data organized or collected in support of the TMDL project. This may include water quality samples, NPDES effluent data, field sheets, photos, monitoring metadata, sampling project plans, or other documentation. The data should be organized by parameter and data source if possible.

Models: All models used for the TMDL project including calibration and scenario models. The models should be organized into subfolders for each model domain and model scenario. Draft models and the final TMDL models will be clearly identified and ideally saved in separate folders. The model folders should include:

- The model with all input and output files and any executable code used;
- Copy of all raw and summarized data (including GIS files) used for model input with data source and location metadata included;
- Scripts or spreadsheets used to transform raw data or used to derive model inputs;
- Key assumptions and documentation for the model setup and parameterization;
- Documentation of newly developed model code or modifications to the existing model; and
- Identification of staff that completed the model.

Meetings: All documents produced for external meetings including agendas, presentations, posters, and meeting handouts. Material for each meeting will be saved in a subfolder organized by date and meeting type. For example the folder name for the first meeting of the TMDL advisory group would be "2022-08-15 Temperature AG 1". Draft documents and final documents will be clearly identified and ideally saved in separate folders.

TMDL documents: At each key stage of TMDL and WQMP development copies of the following documents will be saved in separate subfolders within the project folder on the Master TMDL directory. The final versions of documents will be clearly identified from drafts and ideally saved in separate folders.

- Public Comment Draft:
  - Briefing memo to DEQ Water Quality Division Administrator or Director on public comment draft
  - Draft TMDL and WQMP Report (Both Word and PDF)
  - Draft TMDL Appendices (Both Word and PDF)
  - Public Notice document
  - TMDL Summary Fact Sheet
  - News release
  - GovDelivery Notice and email
  - Other public notification emails
  - Mailing List (if used)
  - Public Comments Errata
- Public Comments Received: Copy of all public comments received
- Final TMDL and WQMP documents:
  - Briefing memo to DEQ Water Quality Division Administrator or Director on final TMDL
  - Signed TMDL order (both Word and PDF)
  - TMDL issuance letter to USEPA (both Word and PDF)
  - USEPA approval letter (USEPA)
  - Response to Comment Document (both Word and PDF)
  - TMDL and WQMP Report (both Word and PDF)
  - TMDL Appendices (both Word and PDF)
  - TMDL Summary Fact Sheet
  - News release
  - GovDelivery Notice and email
  - Other public notification emails
  - Relevant EQC agenda documents
  - Designated Management Agency/Responsible Person notification letters (both Word and PDF)
  - Addendums
  - Errata
  - Petitions
  - Director's Petition Action (acceptance or rejection of petition)
  - Response to Petition
  - ATTAINS upload files

14 QAPP review and approval

The DEQ Project Technical Lead will distribute the draft QAPP to the respective DEQ and USEPA project team members for review. Comments will be provided to the Project Technical Lead for further discussion. When possible, revision and submittal of the final plan will be made within 10 business days

of receipt of comments. Following approval, the Project Technical Lead will distribute the final, signed copy to the respective DEQ and USEPA project team members.

USEPA has an independent responsibility for this QAPP and must complete a separate approval protocol. USEPA approval is necessary for USEPA contractors to begin any modeling work.

Official copies of the final, approved QAPP will be retained in DEQ's document control system. If any change(s) to the QAPP are required during the project, they must be described in a memorandum and approved by the signatories to this QAPP and attached to the QAPP.

15 Implementation and adaptive management

DEQ plans to develop a Risk Management Plan to identify project constraints, the risks that may arise during project implementation, and potential solutions. Identified project constraints include the abbreviated project schedule with hard deadlines established via court order, limited resources, uncertain funding from USEPA, and a complex TMDL technical effort which may require additional time and public process. Projects risks from these constraints and proposed solutions are described in Table 44.

Table 44: Projects risks and proposed solutions.

Risk Description	Solution
Extended public process for complex TMDLs	Communication to DEQ manager and external contacts as deemed necessary by the manager
Team member availability: Inadequate resources to effectively produce the TMDL	Dedicate additional resources to support the effort from internal staff
Delivery commitment	Designate the projects as priority and dedicate additional resources to support the effort from internal staff or contractor (depending on contractor funding)
Scope creep: Working on the TMDLs could be an opportunity for attempts to add additional technical work that are outside the project scope	Sponsor and Manager to address scope creep with stakeholders as necessary

Should a situation arise that requires a significant change in the technical approach, the project team will update the QAPP as needed through revisions or addenda.

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17 Revision history

Table 45: QAPP revision history.

Revision	Date	Changes	Editor
1.0	2/10/2022	New QAPP	R. Michie

Appendix A Meteorology data summary

Table 46: Meteorological stations and data available in the National Climatic Data Center (NCDC) database in the Willamette River mainstem and major tributaries QAPP project area.

Station ID	Station	Latitude/Longitude
10009634	PORTLAND TROUTDALE AIRPORT	45.55/-122.4
20015998	COTTAGE GROVE DAM	43.7167/-123.05
20016011	DORENA DAM	43.7833/-122.967
20016012	COTTAGE GROVE 1 NNE	43.8078/-123.049
20016036	LOOKOUT POINT DAM	43.9167/-122.767
20016067	COUGAR DAM	44.1333/-122.25
20016069	LEABURG 1 SW	44.1/-122.683
20016093	HARRISBURG	44.2667/-123.167
20016120	FOSTER DAM	44.4167/-122.667
20016137	WATERLOO	44.5/-122.817
20016139	CORVALLIS	44.5/-123.283
20016163	LACOMB 3 NNE	44.6333/-122.717
20016164	ALBANY TELEMARK	44.6389/-123.106
20016166	CORVALLIS STATE UNIV	44.6333/-123.2
20016186	JEFFERSON	44.7167/-123.017
20016189	DETROIT DAM	44.7167/-122.25
20016199	MEHAMA	44.7889/-122.617
20016200	STAYTON	44.7894/-122.814
20016201	SUVER TELEMETERING	44.7833/-123.233
20016219	MONMOUTH	44.85/-123.233
20016230	SALEM MCNARY FIELD	44.9078/-122.995
20016241	SALEM	44.9444/-123.042
20016265	MOLALLA 2 ESE	45.1392/-122.533
20016283	AURORA	45.2333/-122.749
20016298	EAGLE CREEK 9 SE	45.2667/-122.2
20016299	ESTACADA 2 SE	45.2689/-122.319
20016300	CANBY	45.25/-122.683
20016302	N WILLAMETTE EXPSTN	45.2833/-122.75
20016304	AURORA STATE AP	45.25/-122.75
20016305	NEWBERG 1 SE	45.2847/-122.959
20016318	WILSONVILLE	45.3/-122.767

Station ID	Station	Latitude/Longitude
20016320	REX 1 S	45.3036/-122.914
20016334	OREGON CITY 1 E	45.3603/-122.573
20016336	OREGON CITY LOCKS	45.3514/-122.633
20016337	OREGON CITY	45.3553/-122.605
20016338	WEST LINN 1 WNW	45.3506/-122.676
20016339	OSWEGO 3 SW	45.3811/-122.706
20016347	CLACKAMAS 2 SE	45.4/-122.533
20016365	SYCAMORE JOHNSONCREEK	45.4778/-122.507
20016388	TROUTDALE 1 ESE	45.5378/-122.377
20016392	PORTLAND KGW TV	45.5181/-122.689
20016393	PORTLAND	45.5186/-122.667
20016413	ROOSTER ROCK STATE PARK	45.545/-122.247
20016427	BONNEVILLE DAM	45.6354/-121.952
20016428	PORTLAND INTL AP	45.5958/-122.609
20016444	CASCADE LOCKS	45.6833/-121.883
20016446	SAUVIES ISLAND	45.6583/-122.835
20016481	ST HELENS	45.8667/-122.8
20016482	ST HELENS RFD	45.8606/-122.81
20016495	GOBLE 3 SW	45.9833/-122.933
20016529	MULTNOMAH FALLS	45.5794/-122.116
20016537	TROUTDALE SUBSTATION	45.5586/-122.403
30000080	PORTLAND NWSFO	45.5611/-122.538
30000722	SCAPPOOSE INDUSTRIAL AP	45.7728/-122.861
30014771	LEBANON	44.5328/-122.901
30015007	LYONS 3N	44.7939/-122.595
30015346	COBURG	44.1319/-123.07
30015582	CANBY 2 N	45.2989/-122.693
30016716	SPRINGFIELD 2.2 NNW	44.0831/-122.99
30017010	GATES 1.1 SE	44.7443/-122.403
30017243	EUGENE 5 ESE	44.0017/-123.009
30017888	EUGENE 4.0 SE	44.0093/-123.06
30017931	ALBANY 3.8 NW	44.6593/-123.138
30018163	EUGENE 3.2 NNE	44.0975/-123.094
30018552	CORVALLIS 3.5 E	44.5682/-123.205
30018590	MONMOUTH 0.9 ESE	44.8433/-123.212
30018803	SPRINGFIELD 1.4 E	44.0505/-122.948
30019606	SPRINGFIELD 10.1E	44.0626/-122.773

Station ID	Station	Latitude/Longitude
30019684	CLACKAMAS 1.9 NNE	45.4364/-122.544
30019696	SWEET HOME 1.0 ESE	44.3968/-122.684
30021262	PORTLAND 1.4 NE	45.5525/-122.635
30021301	CANBY 0.2 S	45.2008/-122.638
30021338	SPRINGFIELD 3.3 E	44.0549/-122.912
30021575	SWEET HOME 2.0 NE	44.4192/-122.671
30021805	LEBANON 4.8 E	44.544/-122.807
30022174	PLEASANT HILL 3 SE	43.9499/-122.885
30022377	EUGENE 4.5 NNW	44.1106/-123.154
30022614	CRESWELL 3.2 NE	43.9336/-122.959
30023021	PORTLAND 4.6 ENE	45.5548/-122.565
30023194	SPRINGFIELD 2.7 W	44.058/-123.03
30023795	KEIZER 1.3 SW	44.9919/-123.043
30023880	COTTAGE GROVE 2.6E	43.8031/-123.003
30024073	COTTAGE GROVE 7.4S	43.6906/-123.058
30024447	SPRINGFIELD 2.8 W	44.0528/-123.033
30024673	CORVALLIS 0.6 ENE	44.5745/-123.265
30024689	EUGENE 2.6 N	44.09/-123.115
30025558	SALEM 3.5 NW	44.9529/-123.081
30026063	JEFFERSON 5.2 NNW	44.7903/-123.032
30026080	LEBANON 1.0 S	44.5204/-122.9
30026753	CORVALLIS 2 SSW	44.539/-123.293
30026852	SWEET HOME 2.6 E	44.4077/-122.65
30026866	ALBANY 0.5 NE	44.623/-123.085
30027000	RALEIGH HILLS 3.1ESE	45.4642/-122.698
30027106	MILWAUKIE 1.3 WSW	45.438/-122.644
30027272	MILWAUKIE 2.1 W	45.4459/-122.663
30027509	CORVALLIS 3 WNW	44.5795/-123.336
30027753	LEBANON 1.1 WNW	44.5417/-122.924
30027757	SPRINGFIELD 2.9 W	44.0511/-123.036
30027807	SPRINGFIELD 2.4 SW	44.0397/-123.022
30028299	SALEM 2.2 SW	44.9039/-123.056
30028952	INDEPENDENCE 5.2SE	44.7925/-123.133
30029018	SPRINGFIELD 6.4 E	44.039/-122.85
30029922	EUGENE 3.2 N	44.099/-123.122
30031506	STAYTON 0.7 ENE	44.8048/-122.783
30031588	LYONS 3.4 ESE	44.7659/-122.539

Station ID	Station	Latitude/Longitude
30032044	CORVALLIS 4.0 NNE	44.6225/-123.238
30032067	KEIZER 1.0 NW	45.0146/-123.034
30032329	EUGENE 2.2 NE	44.0721/-123.076
30032646	PHILOMATH 1.6 NE	44.558/-123.337
30032941	DALLAS 1.0 WSW	44.9183/-123.333
30033126	DEXTER 1 W	43.9172/-122.824
30033451	EUGENE 5.8 SSE	43.9799/-123.054
30033463	TROUTDALE 4.2 ESE	45.5109/-122.313
30033943	MILL CITY 0.4 WSW	44.7485/-122.484
30035145	TROUTDALE 5.0 E	45.5276/-122.288
30035686	PORTLAND 2.5 SE	45.5116/-122.62
30035914	COTTAGE GROVE 2.7E	43.7933/-123.002
30036051	CANBY 0.2 N	45.2691/-122.692
30036421	DALLAS 0.3 NE	44.9245/-123.308
30036881	OREGON CITY 2.2 NE	45.3706/-122.571
30036901	DALLAS 1.0 W	44.9203/-123.332
30037697	SANTA CLARA 1.1 NNW	44.13/-123.139
30038080	CORVALLIS 2.1 NW	44.5936/-123.305
30038890	CORVALLIS 1.9 SSE	44.5464/-123.259
30039205	NORTH ALBANY 2.7NW	44.6911/-123.148
30039442	CRESWELL 1 SE	43.9064/-123.008
30039811	ALBANY 0.5 SE	44.611/-123.085
30039881	LEABURG 2 E	44.1131/-122.648
30040245	ST. HELENS 1 W	45.861/-122.831
30040315	LOWELL 2.6 WNW	43.9408/-122.823
30040565	COLUMBIA CITY 0.6NW	45.9031/-122.82
30041046	SPRINGFIELD 1.3 N	44.0717/-122.981
30041248	SALEM 5 NE	44.9881/-122.987
30041768	SPRINGFIELD 1.1 WNW	44.0583/-122.998
30041863	SALEM 1.0 S	44.9131/-123.042
30041874	LAKE OSWEGO 1.3 ESE	45.4059/-122.672
30042264	CORVALLIS 0.2 E	44.5715/-123.271
30042328	CORVALLIS 2.3 NW	44.5961/-123.307
30043389	EUGENE 2.6 ENE	44.0706/-123.066
30043808	SCIO 4.2 SW	44.6694/-122.918
30044169	SPRINGFIELD 0.9 NW	44.0628/-122.99
30044366	RIVER ROAD 0.7 NW	44.0918/-123.142

Station ID	Station	Latitude/Longitude
30044409	DALLAS 3 WNW	44.9392/-123.367
30044561	CORVALLIS 1.5 NW	44.5867/-123.298
30044590	SALEM 1.1 WSW	44.9161/-123.041
30045093	SPRINGFIELD 1.5 SE	44.0344/-122.958
30045249	SPRINGFIELD 1.8 WNW	44.0662/-123.008
30045922	SALEM 2 W	44.9253/-123.049
30046138	DALLAS 1.3 NNW	44.9374/-123.325
30046286	OREGON CITY 5.5 ESE	45.3131/-122.493
30046570	EUGENE 2.5 NE	44.0807/-123.081
30048290	PORTLAND 0.8 ENE	45.5416/-122.64
30048318	ALBANY 3.6 NW	44.6545/-123.141
30048684	SPRINGFIELD 2.9 E	44.0508/-122.919
30048790	SPRINGFIELD 2.1 WNW	44.0684/-123.014
30049753	LOWELL 1 SE	43.9197/-122.778
30050028	WARREN 1 SW	45.8153/-122.857
30050530	WEST LINN 1 NW	45.3778/-122.646
30051280	CORVALLIS 2.2 NW	44.5947/-123.306
30051571	EUGENE 2.5 ENE	44.0686/-123.066
30051837	BORING 1 E	45.4231/-122.372
30052262	CRESWELL 3 N	43.9533/-123.026
30052645	SALEM 2.7 NW	44.9529/-123.06
30053029	COTTAGE GROVE 7.7S	43.6867/-123.05
30053284	CANBY 5.4 SE	45.2039/-122.625
30053359	TURNER 6.6 S	44.7504/-122.936
30053926	AUMSVILLE 5.4 S	44.7672/-122.879
30055173	CRESWELL 2.4 N	43.9533/-123.017
30055634	SALEM 3.2 WNW	44.9402/-123.084
30056882	OREGON CITY 1.0 NNW	45.3411/-122.563
30057298	EUGENE 2.4 NNW	44.0831/-123.135
30057382	PLEASANT HILL 1 S	43.9675/-122.945
30057597	EUGENE 1.3 NNW	44.0744/-123.117
30057770	EUGENE 3.5 ESE	44.0268/-123.051
30057853	JENNINGS LODGE 0.2 SW	45.3907/-122.617
30058972	SCIO 2.3 SW	44.6833/-122.883
30060240	EUGENE 4.3 NNW	44.1117/-123.138
30060263	KEIZER 1.4 N	45.0242/-123.018
30060592	MILWAUKIE 1.6 E	45.4486/-122.586

Station ID	Station	Latitude/Longitude
30060605	PORTLAND 7 SW	45.4681/-122.681
30060627	INDEPENDENCE 0.3NNW	44.8592/-123.195
30061014	CORVALLIS 4.2 W	44.5797/-123.343
30062775	PORTLAND 2.1 SE	45.5136/-122.631
30063543	ESTACADA 3 WNW	45.3108/-122.39
30063874	SPRINGFIELD 2.9 ESE	44.0433/-122.92
30063916	CORVALLIS 2.7 SSW	44.5374/-123.304
30064477	SPRINGFIELD 3.9 E	44.0492/-122.898
30064620	SPRINGFIELD 2.1 NW	44.0708/-123.012
30064714	CRESWELL 0.4 SE	43.9147/-123.012
30064921	CORVALLIS 2.5 NE	44.5994/-123.246
30065961	SPRINGFIELD 1.6 N	44.0756/-122.981
30066870	EUGENE 1.5 NNE	44.072/-123.098
30067412	SPRINGFIELD 2 WSW	44.0481/-123.002
30068486	TUALATIN 0.6 SSE	45.3684/-122.766
30069621	DEXTER 4.7 SSE	43.8511/-122.792
30069971	EUGENE 1.5 NNW	44.0733/-123.124
30070116	EUGENE 2.4 NNE	44.0845/-123.092
30072236	PORTLAND 2.6 NW	45.5631/-122.698
30075421	TROUT CREEK OREGON	44.1111/-122.575
30075807	STAYTON OREGON	44.75/-122.867
30078131	SCIO 2.2 N	44.7372/-122.842
30078418	CORVALLIS 2.2 WSW	44.5587/-123.316
30078482	MILWAUKIE 0.5 SE	45.4395/-122.611
30078524	ALBANY 3.1 NNW	44.6553/-123.126
30078527	DAMASCUS 2.4 WSW	45.4012/-122.503
30078985	MILL CITY 0.8 W	44.7524/-122.494
30078990	MEHAMA 0.7 ESE	44.7869/-122.605
30079009	CORVALLIS 3.8 WNW	44.597/-123.345
30079040	LEBANON 0.5 SE	44.5304/-122.897
30079081	CORVALLIS 3.1 NNW	44.6139/-123.297
30079083	LAKE OSWEGO 0.7 SE	45.406/-122.688
30079086	ALBANY 2.5 WSW	44.5996/-123.137
30079104	ALBANY 3.2 NW	44.6462/-123.143
30079129	DALLAS 1.3 WSW	44.9121/-123.336
30079191	RAINIER 5.7 WNW	46.114/-123.061
30079196	ALBANY 2.7 NE	44.6454/-123.055

Station ID	Station	Latitude/Longitude
30079264	CORVALLIS 5.2 NNE	44.6411/-123.238
30079332	ST. HELENS 0.6 N	45.869/-122.812
30079366	ALBANY 1.1 SSE	44.6022/-123.084
30079369	ALBANY 4.9 NNE	44.6844/-123.064
30079400	CORVALLIS 0.4 ENE	44.5726/-123.269
30079401	ALBANY 0.7 NE	44.6232/-123.079
30079457	CORVALLIS 3.6 WNW	44.5882/-123.344
30079486	SALEM 4.0 NW	44.9699/-123.074
30079497	ALBANY 4.5 NW	44.6706/-123.143
30079524	EUGENE 6.5 ESE	44.0045/-123
30080520	RAINIER 0.4 WSW	46.0894/-122.954
30081010	SCAPPOOSE 0.7 S	45.7409/-122.882
30081545	ST. HELENS 0.4 NW	45.8642/-122.819
30082551	COLUMBIA CITY 0.5S	45.8903/-122.809
30082837	RAINIER 6.2 W	46.1083/-123.074
30083006	CLATSKANIE 5.0 NE	46.1507/-123.127
30083050	ST. HELENS 3.5 NW	45.8941/-122.866
30083095	PORTLAND 2.1 E	45.5382/-122.613
30083968	EUGENE 3.4 NE	44.0845/-123.059
30084194	CORVALLIS 2.7 SSE	44.5326/-123.262
30084238	COLUMBIA CITY 1.0S	45.8834/-122.807
30084309	PORTLAND 4.9 SSW	45.4534/-122.698
30084384	LAKE OSWEGO 1.2 NW	45.4226/-122.717
30084568	PORTLAND 4.8 S	45.4545/-122.678
30084722	PORTLAND 2.4 N	45.5734/-122.662
30084826	WESTERN ECOLOGY DIVISION	44.5655/-123.294
30084827	TINGEY NATIONAL FOREST	44.5657/-123.293
30084904	ALBANY 5.4 NNW	44.6827/-123.15
30084953	SHERWOOD 3.3 SE	45.3283/-122.791
30090676	HAPPY VALLEY 1.7ESE	45.434/-122.504
30094353	LEBANON 6.0 SE	44.4815/-122.808
30094359	PORTLAND 5.7 SSW	45.4462/-122.719
30094422	MILWAUKIE 0.9 NNE	45.4558/-122.614
30094433	MONMOUTH 6.3 S	44.7591/-123.232
30094438	CORVALLIS 5.0 NNE	44.6412/-123.255
30094486	TURNER 6.0 SSE	44.7647/-122.906
30094667	ALBANY 5.0 WSW	44.5834/-123.182

Station ID	Station	Latitude/Longitude
30094777	ESTACADA 5.2 WNW	45.3321/-122.425
30094841	PORTLAND 2.3 SW	45.52/-122.695
30094894	CORVALLIS 1.7 SW	44.5514/-123.296
30094930	LEBANON 2.3 E	44.535/-122.858
30094947	CORVALLIS 2.4 SSE	44.5399/-123.256
30094962	LAKE OSWEGO 0.6 N	45.4209/-122.7
30101008	COTTAGE GROVE 2.3N	43.8303/-123.055
30101323	SALEM 2.9 NW	44.9485/-123.069
30101393	RAINIER 7.2 S	45.9891/-122.963
30101437	CORVALLIS 1.5 NNW	44.5889/-123.294
30101477	COTTAGE GROVE 0.2ESE	43.7961/-123.052
30101493	BORING 0.6 WSW	45.4276/-122.365
30101703	PORTLAND 4.0 ESE	45.5225/-122.578
30101708	LEBANON 11.5 ESE	44.4511/-122.704
30101780	KEIZER 1.4 NNW	45.0231/-123.027
30101970	CANBY 0.5 ENE	45.2693/-122.683
30102326	MONROE 0.5 SE	44.3107/-123.293
30102568	NEWBERG 0.3 N	45.3103/-122.961
30102589	MILWAUKIE 2.9 S	45.4025/-122.614
30102961	NIMROD 0.3 SSW	44.1099/-122.425
30103182	PORTLAND 5.2 ESE	45.5061/-122.559
30103186	LAKE OSWEGO 1.4 NNW	45.4304/-122.708
30103215	SALEM 1.2 W	44.9239/-123.046
30103669	MONMOUTH 0.9 SE	44.8419/-123.215
30103780	SPRINGFIELD 2.8 SW	44.0283/-123.023
30103926	EUGENE 2.1 NNW	44.083/-123.122
30103931	WEST LINN 0.7 NW	45.3749/-122.649
30103982	PORTLAND 4.1 NW	45.5772/-122.719
30106993	DALLAS 1.2 WSW	44.9127/-123.333
30107090	ALBANY 2.9 N	44.6585/-123.087
30107192	CORVALLIS 1.8 NNW	44.595/-123.289
30107262	LEBANON 11.3 ESE	44.4484/-122.711
30107512	PORTLAND 2.8 E	45.5425/-122.599
30107636	INDEPENDENCE 0.6WSW	44.8517/-123.204
30107748	CORVALLIS 1.9 NW	44.5882/-123.307
30108032	SHEDD 1.9 NW	44.4766/-123.143
30108108	SALEM 2.2 WNW	44.9394/-123.062

Station ID	Station	Latitude/Longitude
30108109	KEIZER 1.4 SSW	44.9867/-123.034
30108544	SWEET HOME 1.0 E	44.404/-122.682
30108628	FAIRVIEW 1.8 SW	45.5293/-122.462
30108701	LEBANON 7.9 SSE	44.4343/-122.829
30109344	CORVALLIS 1.0 E	44.5737/-123.255
30109528	LAFAYETTE 0.5 NNE	45.2517/-123.105
30110184	CORVALLIS 1.2 NNE	44.5876/-123.268
30111653	LAKE OSWEGO 1.5 N	45.4344/-122.699
30111694	TANGENT 0.7 NW	44.5586/-123.117
30111769	PORTLAND 5.8 S	45.4393/-122.696
30111991	PORTLAND 7.7 E	45.5294/-122.498
30112117	EUGENE 2.7 ESE	44.0402/-123.061
30112174	PORTLAND 2.8 ENE	45.5474/-122.6
30112217	MILL CITY 0.9 ESE	44.7467/-122.46
30112336	PORTLAND 3.2 SE	45.5063/-122.609
30112347	LEBANON 5.4 E	44.5245/-122.797
30112353	SALEM 2.5 WNW	44.9438/-123.066
30112459	STAYTON 8.4 E	44.7903/-122.626
30112481	CORVALLIS 0.9 NE	44.5791/-123.262
30112526	CORVALLIS 1.6 NW	44.5874/-123.298
30112529	EUGENE 4.7 NNW	44.1168/-123.143
30112568	PORTLAND 4.7 NW	45.5817/-122.731
30112589	CORVALLIS 3.2 N	44.6178/-123.282
30112635	JUNCTION CITY 7.3WNW	44.2444/-123.347
30112707	HARRISBURG 0.4 SSE	44.2638/-123.161
30112741	SWEET HOME 1.7 WSW	44.388/-122.732
30112751	LAKE OSWEGO 2.1 SW	45.3937/-122.733
30112842	GATES 1.4 SW	44.7406/-122.438
30113064	DALLAS 1.5 WNW	44.9319/-123.339
30113201	CORVALLIS 4.6 N	44.6364/-123.262
30113338	ALBANY 7.0 NNW	44.7122/-123.142
30114258	CORVALLIS 1.6 SSW	44.5513/-123.293
30115312	SALEM 4.3 NNE	44.9817/-122.99
30115405	LEBANON 1.8 NNW	44.5595/-122.919
30116606	CORVALLIS 3.4 W	44.5796/-123.344
30118440	SPRINGFIELD 1.6 NW	44.0675/-123.002
30118824	EUGENE 4.9 NNW	44.1222/-123.132

Station ID	Station	Latitude/Longitude
30119313	LAKE OSWEGO 1.4 NNE	45.4299/-122.685
30120318	LEBANON 1.1 SSW	44.5207/-122.913
30120676	SWEET HOME 0.2 SE	44.3997/-122.698
30120779	PORTLAND 5.9 NW	45.5981/-122.745
30120849	MILWAUKIE 0.6 SSW	45.4362/-122.624
30120894	CORVALLIS 0.5 WNW	44.5729/-123.287
30120960	ALBANY 4.7 NW	44.672/-123.149
30120974	WEST LINN 1.5 W	45.3723/-122.668
30121001	LEBANON 0.7 N	44.5455/-122.902
30121024	PORTLAND 2.6 ESE	45.5202/-122.609
30121095	CLACKAMAS 1.9 W	45.4105/-122.592
30121409	DAMASCUS 0.9 WNW	45.4224/-122.476
30121413	SALEM 1.9 ENE	44.9357/-122.986
30121777	LAKE OSWEGO 2.0 NNW	45.4389/-122.714
30122797	PORTLAND 2.0 N	45.5678/-122.658
30122879	SPRINGFIELD 1.4 WNW	44.0602/-123.004
30122949	ESTACADA 5.4 WNW	45.3326/-122.428
30122989	EUGENE 1.8 NNE	44.0756/-123.094
30123082	CORVALLIS 1.4 N	44.5916/-123.271
30123283	TUALATIN 0.4 SE	45.371/-122.767
30123435	JUNCTION CITY 8.6W	44.2211/-123.377
30123648	PORTLAND 6.9 E	45.5515/-122.515
30123833	SPRINGFIELD 3.5 W	44.0518/-123.047
30124023	SALEM 3.6 SSW	44.8811/-123.063
30124556	LYONS 0.8 WNW	44.7828/-122.62
30125233	HAZELWOOD 2.1 S	45.4868/-122.521
WBAN 04236	CORVALLIS AIRPORT	44.42/-123.33
WBAN 24221	EUGENE AIRPORT	44.13/-123.22

Table 47: Meteorological stations and data, including humidity, precipitation, temperature, wind direction, and wind speed, available in the Remote Automatic Weather Station (RAWS) database in the Willamette River mainstem and major tributaries QAPP project area.

Station ID	Station	Latitude/Longitude	Agency
orOLOC	LOCKS	45.6694/-121.882	S&PF

Table 48: Meteorological stations and data, including air temperature, precipitation, relative humidity and wind, available in the USBR AgriMet database in the Willamette River mainstem and major tributaries QAPP project area.

Station ID	Station	Latitude/Longitude
ARAO	AURORA, OREGON AGRIMET WEATHER STATION	45.2819/-122.75
CRVO	CORVALLIS, OREGON AGRIMET WEATHER STATION	44.6342/-123.19
LKPO	LOOKOUT POINT DAM WEATHER STATION, OREGON	43.9167/-122.753

Table 49: Meteorological stations and data, including air temperature, precipitation, relative humidity, wind speed and wind direction, available in the MesoWest database in the Willamette River mainstem and major tributaries QAPP project area.

Station ID	Station	Latitude/Longitude
1945P	STAR LAB CRESTON KENILWORTH	45.4951/-122.639
1946P	PSU STAR LAB ROSE CITY PARK	45.5441/-122.596
1948P	STAR LAB HOMESTEAD NEIGHBORHOOD	45.5002/-122.693
1950P	STAR LAB - HILLSDALE	45.4769/-122.684
1951P	ROSEWOLD	43.9948/-122.996
1952P	COLLEGE PARK	45.3103/-122.967
1956P	MARION COURT APARTMENTS	45.5119/-122.63
1957P	LRAPA-LOWELL FD	43.9228/-122.782
1959P	LRAPA - COTTAGE GROVE SOUTH	43.7795/-123.06
1960P	LRAPA - THURSTON	44.04/-122.895
1961P	RED FOX HILLS	45.4306/-122.678
1965P	LRAPA-MADISON MS	44.1163/-123.121
1966P	LRAPA-EMERALD PARK	44.0844/-123.141
1968P	LRAPA-OFFICE OUTSIDE	44.0463/-123.012
1969P	LRAPA - COTTAGE GROVE	43.7997/-123.053
1970P	775 1/2 E MILTON ST	44.5332/-122.896
1973P	PSU STAR LAB EDGEWATER	45.5821/-122.747
1975P	PSU STAR LAB CULLY	45.5582/-122.606
1980P	83686 HAWKS WAY	43.9374/-122.932
1983P	IRVINGTON NE 12TH & TILLAMOOK	45.5372/-122.653
1985P	MILLER	45.5794/-122.708
1986P	BYUKI PROJECT	45.4926/-122.64
1987P	ROBSON ACRES	45.1949/-122.639
1988P	KC HOME	45.2232/-122.679
1990P	PSU STAR LAB SEL	45.4968/-122.603
1991P	NORTH MIDWAY AVE.	45.5923/-122.736
1993P	LRAPA-GUY LEE ELEMENTARY	44.0698/-123.039

Station ID	Station	Latitude/Longitude
1994P	LRAPA-CENTENNIAL ELEMENTARY	44.0573/-123.041
1995P	LRAPA-CRESWELL HS	43.9237/-123.029
1997P	LRAPA-WALTERVILLE ELEMENTARY	44.0789/-122.761
1999P	LRAPA-SAGINAW	43.8347/-123.035
2004P	LRAPA-SHELDON HS	44.0821/-123.076
2005P	LRAPA-NORTH EUGENE HS	44.0943/-123.135
2008P	LRAPA-MCKENZIE SCHOOLS	44.1521/-122.362
2010P	LRAPA-GILHAM ELEMENTARY	44.0997/-123.076
2011P	LRAPA-THURSTON HS	44.0483/-122.924
2012P	LRAPA-AGNES STEWART MS	44.0371/-122.982
2014P	LRAPA-SPRINGFIELD HS	44.0534/-123.013
2015P	WILSONVILLE MEADOWS	45.313/-122.749
2018P	NW DISTRICT 2343	45.5327/-122.7
2021P	CORBETT	45.5253/-122.23
2026P	KU'ALE HEIGHTS MILWAUKIE - OR	45.432/-122.637
2029P	CASCADE 17 OUTSIDE	44.8078/-122.915
2032P	EDGEWOOD OUTSIDE	45.5043/-122.699
2036P	FERGUSON RD & TURNBOW LN	44.2444/-123.346
2038P	COUNTRYGLEN KEIZER	45.0175/-123.017
2039P	UPPER MULTNOMAH VILLAGE	45.474/-122.705
2049P	NE GLISAN	45.5264/-122.625
2050P	SUNSET AIR	45.3576/-122.629
2053P	GH TILLAMOOK ROW	45.5376/-122.667
2056P	3DADAMS WEATHER	45.3719/-122.765
2058P	N VANCOUVER	45.5542/-122.668
2059P	CARPENTER FAM	45.5747/-122.698
2060P	JAN'S AIR	45.5763/-122.667
2064P	LOWELL - OR	43.9179/-122.781
2065P	SOUTH TABOR	45.5046/-122.595
2067P	PPR WASHINGTON PARK SOUTH	45.5102/-122.717
2072P	LEWIS & CLARK COLLEGE	45.4519/-122.673
2073P	MIRABELLA	45.4977/-122.67
2076P	COOKS BUTTE	45.3924/-122.698
2081P	WOU ATHLETICS	44.8502/-123.239
2084P	MARKS RIDGE-SWEET HOME	44.4341/-122.702
2087P	BENSON 4	45.5266/-122.651
2088P	BENSON 3	45.5273/-122.652

Station ID	Station	Latitude/Longitude
2090P	BENSON 1	45.5278/-122.651
2091P	BENSON 2	45.5278/-122.652
2093P	PPPM-CRESCENT PARK	44.0959/-123.053
2097P	WILLAMETTE UNIVERSITY - SPARKS CENTER	44.9347/-123.03
2105P	GEORGE FOX UNIVERSITY	45.3052/-122.968
2111P	PPPM-HENDRICKS HALL	44.044/-123.075
2112P	36TH & SE WOODWARD	45.5017/-122.626
2698P	FAIRVIEW - OR	45.5336/-122.436
2778P	2240 SE 24TH AVE	45.5065/-122.641
2995P	PPPM-AUTZEN	44.0585/-123.071
3008P	CONCORDIA	45.5296/-122.646
3137P	NEARBY NATURE	44.0539/-123.074
3168P	WEST LINN -DOWNTOWN	45.3441/-122.65
3461P	CHAPARRAL HOME	44.5835/-123.361
3600P	LIGHTHOUSE	45.5654/-122.669
3663P	PPPM - WALTON	44.044/-123.071
3675P	RIDGEWOOD RANCH	44.8094/-122.711
3691P	SANDEE PALISADES - TROUTDALE	45.527/-122.378
3722P	SOUTH WOODSTOCK	45.4631/-122.625
3878P	CANBY AIR STATION 1C	45.2614/-122.675
3884P	EURO-ASIAN AUTOMOTIVE	44.571/-123.26
3951P	SOUTH BURLINGAME	45.4663/-122.683
4087P	SHARKTANK	45.5399/-122.618
A3796	PORTLAND - SAUVIE ISLAND	45.7685/-122.772
A3804	TURNER - CJHS	44.8103/-122.915
A3805	PORTLAND - SE LAFAYETTE	45.4966/-122.603
A3810	PORTLAND NEAR ROAD	45.3992/-122.746
A4199	CORVALLIS - CIRCLE BLVD.	44.5884/-123.267
A4212	SPRINGFIELD CITY HALL	44.0467/-123.018
A4214	COTTAGE GROVE CITY SHOPS	43.7995/-123.054
A4215	ALBANY - CALAPOOIA SCHOOL	44.6157/-123.091
A4216	SWEET HOME - FIRE DEPARTMENT	44.3958/-122.731
A4217	LYONS	44.7787/-122.617
A4219	SALEM - STATE HOSPITAL	44.9431/-123.006
A4496	EUGENE - WILKES DR.	44.1158/-123.121
A4685	PORTLAND CULLY HELENSVIEW SCHOOL	45.5622/-122.576
A4686	SAGINAW - DELIGHT VALLEY SCHOOL	43.8345/-123.035

Station ID	Station	Latitude/Longitude
A4719	MILL CITY	44.7521/-122.48
A4730	GRESHAM CENTENNIAL HS	45.4962/-122.483
A4741	DALLAS LACREOLE MIDDLE SCHOOL	44.9226/-123.302
A4751	PORTLAND JEFFERSON HIGH SCHOOL	45.5609/-122.672
A4779	ESTACADA CLACKAMAS RIVER ELEMENTARY SCHOOL	45.2914/-122.333
AP080	K9AZZ-10 VIDA	44.145/-122.588
AP477	KC7ZPO MILWAUKIE	45.4123/-122.638
AR115	EUGENE EUGENE	44.0555/-123.085
AR232	KC7RJK-2 EUGENE	44.1089/-123.149
AR683	W7FAA GLADSTONE	45.4017/-122.6
AR754	KA8ZGM CORVALLIS	44.597/-123.254
AR802	AC7TK-2 EUGENE	44.0817/-123.064
AR969	KB7PGV GRESHAM	45.4787/-122.387
AS192	WH6KO ST HELENS	45.8543/-122.819
AS252	KE7FUZ PORTLAND	45.5488/-122.619
AS522	W7OBH CANBY	45.2567/-122.685
AS864	N4AEN PORTLAND	45.492/-122.512
AT283	WH6KO-10 ST HELENS	45.8636/-122.797
AT321	W7BDB SALEM	45.0078/-123.009
AT595	K7JKM KEIZER	45.0172/-123.017
AT600	WA7GL-10 MONROE	44.3198/-123.311
AT638	KK7N TROUTDALE	45.5243/-122.375
AT954	K7JDK PORTLAND	45.454/-122.694
AU187	KD7SYS-1 DALLAS	44.9345/-123.325
AU524	W7APD KEIZER	44.9885/-123.024
AU650	KA7IKB-2 WEST LINN	45.3923/-122.655
AU658	N7CVZ CORBETT	45.5295/-122.271
AU732	K7LWV DALLAS	44.916/-123.333
AU762	WA7SHP-13 SALEM	44.9153/-123.057
AU774	KC7CDD PORTLAND	45.581/-122.731
AU998	KC6RZW-10 MILWAUKIE	45.4052/-122.584
AV511	KI7RM-1 MILWAUKIE	45.4355/-122.624
AV613	WB6RDV-3 GATES	44.7542/-122.392
AV691	KK7DS HAPPY VALLEY	45.4597/-122.516
AV707	K5VP NEWBERG	45.3458/-122.984
AV725	KI7JYE NEWBERG	45.3121/-122.943

Station ID	Station	Latitude/Longitude
BPTRO	TROUTDALE	45.5583/-122.402
C0493	CW0493 DALLAS	44.9337/-123.327
C0825	CW0825 SWEET HOME	44.3957/-122.702
C1092	CW1092 MCMINNVILLE	45.0333/-123.05
C1183	CW1183 MILWAUKIE	45.413/-122.638
C1250	CW1250 SALEM	44.9842/-123.002
C1268	CW1268 TUALATIN	45.3683/-122.766
C1657	CW1657 EAGLE CREEK	45.3492/-122.36
C1753	CW1753 PORTLAND	45.5075/-122.731
C1855	CW1855 LIBERAL	45.186/-122.587
C2188	CW2188 AUMSVILLE	44.8167/-122.867
C2645	CW2645 EUGENE	44.0373/-123.066
C2664	CW2664 CORBETT	45.5313/-122.292
C2936	CW2936 PORTLAND	45.5029/-122.523
C3067	CW3067 EUGENE	44.0678/-123.06
C3580	CW3580 MULTNOMAH VILLAGE	45.465/-122.709
C3798	CW3798 PORTLAND	45.5072/-122.593
C3812	CW3812 LAKE OSWEGO	45.4097/-122.669
C4896	CW4896 WALTERVILLE	44.07/-122.83
C5276	CW5276 HILLSBORO	45.6187/-122.865
C5404	CW5404 DALLAS	44.918/-123.296
C5416	CW5416 CANBY	45.2797/-122.688
C5646	CW5646 PORTLAND	45.4422/-122.719
C5709	CW5709 CORVALLIS	44.5513/-123.291
C6790	CW6790 RIVERGROVE	45.3852/-122.737
C7021	CW7021 PORTLAND	45.4748/-122.616
C7295	CW7295 ST. HELENS	45.8592/-122.848
C7563	CW7563 TUALATIN	45.372/-122.765
C7745	CW7745 OREGON CITY	45.3385/-122.53
C7901	CW7901 SPRINGFIELD	44.022/-122.873
C8730	CW8730 DAMASCUS	45.4083/-122.5
C8892	CW8892 SWEET HOME	44.3929/-122.722
C9093	CW9093 AURORA	45.287/-122.771
C9149	CW9149 CORBETT	45.5145/-122.3
C9252	CW9252 ESTACADA	45.2981/-122.288
C9266	CW9266 SALEM	44.9777/-123.083
C9399	CW9399 JEFFERSON	44.7352/-123.002

Station ID	Station	Latitude/Longitude
C9654	CW9654 CANBY	45.2692/-122.692
C9669	CW9669 SPRINGFIELD	44.0512/-123.036
C9796	CW9796 PORTLAND	45.5475/-122.653
CANO3	MOLALLA RIVER NEAR CANBY 1S	45.2444/-122.686
COOPBOMO3	WEATHER DATA	45.64/-121.95
COOPCGWO3	COUGAR DAM PRECIP	44.13/-122.24
COOPCTGO3	COTTAGE GROVE	43.81/-123.05
COOPCVOO3	CORVALLIS STATE UNIVERSITY	44.63/-123.19
COOPDODO3	DORENA DAM CO-OP STN	43.78/-122.96
COOPDTTO3	DETROIT DAM PRECIP STN	44.72/-122.25
COOPEAGO3	EAGLE CRK FISH HATCHERY	45.27/-122.2
COOPFADO3	P.G.E. RAFADAY POWERHOUSE	45.27/-122.32
COOPLEAO3	LEABURG	44.1/-122.69
COOPLPWO3	LOOKOUT POINT DAM NWS PRECIP GAGE	43.91/-122.76
COOPORYO3	FIRE STATION	45.36/-122.61
COOPPDX	INTERNATIONAL AIRPORT	45.59/-122.6
COOPPGWO3	KGW-TV	45.52/-122.69
COOPPQR	PORTLAND, OR	45.56/-122.54
COOPREXO3	COOP STN NAME = REX 1 S	45.3/-122.91
COOPSLE	SALEM ARPT (MCNARY FIELD)	44.91/-123
COOPSTYO3	CITY TREATMENT PLANT	44.79/-122.81
COOPTRTO3	BPA TROUTDALE SUBSTATION	45.56/-122.4
COOPTTDO3	SANDY RIVER NR TROUTDALE	45.54/-122.38
D0160	DW0160 TURNER	44.7507/-122.935
D0228	DW0228 EAGLE CREEK	45.3487/-122.362
D0475	DW0475 CANBY	45.2455/-122.648
D0603	DW0603 AURORA	45.2955/-122.774
D1732	DW1732 PORTLAND	45.5158/-122.592
D2682	DW2682 PORTLAND	45.5/-122.633
D2889	DW2889 WEST LINN	45.3843/-122.656
D3557	DW3557 PORTLAND	45.4842/-122.69
D3605	DW3605 CORBETT	45.5211/-122.161
D3762	DW3762 PORTLAND	45.4915/-122.599
D4122	DW4122 EUGENE	44.0958/-123.054
D4147	DW4147 DUNDEE	45.2933/-123.005
D4360	DW4360 PORTLAND	45.4957/-122.62
D4839	DW4839 HAPPY VALLEY	45.4521/-122.546

Station ID	Station	Latitude/Longitude
D5318	DW5318 SE PORTLAND	45.4685/-122.593
D5719	DW5719 JUNCTION CITY	44.1822/-123.305
D5901	DW5901 STAYTON	44.7517/-122.81
D6006	DW6006 TROUTDALE	45.5277/-122.39
D6016	DW6016 MILWAUKIE	45.4508/-122.605
D6048	DW6048 LEBANON	44.5045/-122.716
D6099	DW6099 CORVALLIS	44.6035/-123.234
D6132	DW6132 PORTLAND	45.5344/-122.512
D6193	DW6193 CROWN POINT	45.5388/-122.244
D6349	DW6349 NEWBERG	45.3052/-122.978
D6393	DW6393 TUALATIN	45.3597/-122.791
D6797	DW6797 STARKSBORO	43.9659/-122.777
D7719	DW7719 STAYTON	44.7987/-122.793
D7980	DW7980 OREGON CITY	45.3662/-122.519
D8151	DW8151 GRESHAM	45.5217/-122.46
D8818	DW8818 DAMASCUS	45.4301/-122.419
D9191	DW9191 PORTLAND	45.5197/-122.632
D9370	DW9370 PORTLAND	45.5862/-122.712
D9403	DW9403 CORBETT	45.504/-122.27
D9430	DW9430 ALBANY	44.645/-123.115
D9524	DW9524 LEBANON	44.5388/-122.902
D9526	DW9526 KING CITY	45.3853/-122.744
D9680	DW9680 YAMHILL	45.3712/-123.109
D9913	DW9913 CHESHIRE	44.1862/-123.287
D9963	DW9963 RIVERGROVE	45.3837/-122.723
DEXO3	MIDDLE FORK WILLAMETTE RIVER NEAR DEXTER	43.9458/-122.836
DSRO3	NRAWS 3 (DODSON)	45.6043/-122.043
E0062	EW0062 DUNDEE	45.2923/-123.06
E0191	EW0191 PORTLAND	45.4901/-122.562
E1091	EW1091 PORTLAND	45.493/-122.508
E1169	EW1169 EUGENE	44.0078/-123.037
E1284	EW1284 OREGON CITY	45.3492/-122.596
E1617	EW1617 PORTLAND	45.5183/-122.61
E1914	EW1914 PORTLAND	45.5373/-122.653
E2024	EW2024 PORTLAND	45.5978/-122.732
E2235	EW2235 TROUTDALE	45.4526/-122.525
E2298	EW2298 PORTLAND	45.5047/-122.67

Station ID	Station	Latitude/Longitude
E2601	EW2601 WEST LINN	45.392/-122.655
E2839	EW2839 DAMASCUS	45.4/-122.45
E3007	EW3007 HAPPY VALLEY	45.4509/-122.544
E3072	EW3072 CORVALLIS	44.5832/-123.284
E3257	EW3257 KEIZER	45.005/-123.04
E4275	EW4275 SPRINGFIELD	44.0674/-122.842
E4438	EW4438 PORTLAND	45.5398/-122.526
E5093	EW5093 PORTLAND	45.5302/-122.701
E5214	EW5214 HAPPY VALLEY	45.4338/-122.504
E5920	EW5920 SALEM	44.9023/-123.026
E6055	EW6055 OREGON CITY	45.3408/-122.611
E6165	EW6165 HAPPY VALLEY	45.4/-122.5
E6414	EW6414 MILL CITY	44.7574/-122.466
E6567	EW6567 PORTLAND	45.7066/-122.868
E7517	EW7517 PORTLAND	45.5217/-122.585
E7604	EW7604 SALEM	44.9618/-123.107
E7700	EW7700 SWEET HOME	44.4025/-122.702
E7764	EW7764 CORVALLIS	44.596/-123.297
E8319	EW8319 MILWAUKIE	45.4563/-122.605
E8347	EW8347 SWEET HOME	44.4345/-122.703
E8380	EW8380 PUYALLUP	45.4595/-122.514
E8614	EW8614 COTTAGE GROVE	43.7875/-123.072
E8660	EW8660 KEIZER	45/-123.011
E9240	EW9240 GRESHAM	45.5075/-122.432
E9538	EW9538 WILSONVILLE	45.312/-122.774
E9637	EW9637 ST HELENS	45.8542/-122.819
E9866	EW9866 CORVALLIS	44.58/-123.353
E9977	EW9977 JUNCTION CITY	44.2445/-123.346
EGKO3	EAGLE CREEK	45.3679/-122.331
ESTO3	CLACKAMAS RIVER NEAR ESTACADA 1NNW	45.3/-122.353
F0409	FW0409 TROUTDALE	45.5275/-122.384
F0653	FW0653 NEWBERG	45.3253/-122.982
F0666	FW0666 NEWBERG	45.3005/-123.046
F0777	FW0777 CORVALLIS	44.63/-123.275
F1067	FW1067 SHEDD	44.4/-123.1
F1302	FW1302 CASCADE LOCKS	45.6723/-121.892
F1967	FW1967 CORBETT MENUCHA RETREAT	45.5372/-122.266

Station ID	Station	Latitude/Longitude
F2157	FW2157 PORTLAND	45.5068/-122.645
F2405	FW2405 EUGENE	44.0255/-123.052
F2474	FW2474 SALEM	44.9458/-123.021
F2727	FW2727 OREGON CITY	45.4458/-122.544
F2822	FW2822 SALEM	44.9063/-123.075
F2984	N1OND COLUMBIA CITY	45.8998/-122.82
F3199	FW3199 HUBBARD	45.1823/-122.808
F3961	FW3961 TURNER	44.8462/-122.95
F4240	FW4240 PORTLAND	45.5327/-122.546
F4241	FW4241 PORTLAND	45.4787/-122.527
F4242	FW4242 PORTLAND	45.5132/-122.524
F4243	FW4243 PORTLAND	45.501/-122.537
F4628	FW4628 PORTLAND	45.4147/-122.616
F4655	FW4655 PORTLAND	45.478/-122.563
F5278	FW5278 PORTLAND	45.5117/-122.618
F5406	FW5406 OREGON CITY	45.3542/-122.598
F5845	FW5845 NEWBERG	45.3017/-122.946
F6341	FW6341 GRESHAM	45.4907/-122.388
F6402	FW6402 CLACKAMAS	45.4142/-122.516
F6494	FW6494 OREGON CITY	45.3487/-122.606
F6522	FW6522 STAYTON	44.7892/-122.815
F7062	FW7062 HAPPY VALLEY	45.4342/-122.555
F7191	FW7191 CORVALLIS	44.5652/-123.244
F7953	FW7953 PORTLAND	45.5132/-122.636
F8313	FW8313 SALEM	44.9578/-123.057
F8434	FW8434 CORBETT	45.5095/-122.297
F8540	FW8540 WOODBURN	45.1938/-122.867
F8658	FW8658 COLUMBIA CITY	45.8932/-122.812
FADO3	RAIN GAGE AT P.G.E. FARADAY POWERHOUSE NEAR ESTACADA	45.2689/-122.317
H0024	12S CORNELIUS	45.338/-123.096
H0227	TURNER	44.75/-122.94
HGNO3	MT HAGAN WEATHER STATION NEAR FINN ROCK	44.1389/-122.411
HYD03	ARLETA SCHOOL	45.4862/-122.596
HYD04	ASTOR ELEMENTARY SCHOOL	45.5789/-122.73
HYD05	BEAUMONT SCHOOL	45.5487/-122.621
HYD07	CASCADE PCC	45.5636/-122.674

Station ID	Station	Latitude/Longitude
HYD08	CHILDREN'S MUSEUM	45.5086/-122.718
HYD09	COLLINS VIEW	45.4541/-122.684
HYD10	COLUMBIA IPS	45.5948/-122.717
HYD16	GRESHAM FIRE DEPT.	45.5076/-122.437
HYD18	HARNEY	45.4623/-122.643
HYD19	HAYDEN ISLAND	45.612/-122.689
HYD21	KELLY SCHOOL	45.4729/-122.57
HYD25	METRO LEARNING CENTER	45.5268/-122.693
HYD26	MT. TABOR MAINTENANCE YARD	45.5057/-122.597
HYD27	MULTNOMAH	45.5127/-122.66
HYD28	OPEN MEADOWS SCHOOL	45.578/-122.7
HYD32	POST OFFICE	45.5839/-122.583
HYD36	SUNNYSIDE SCHOOL	45.5146/-122.629
HYD43	VERNON SCHOOL	45.5624/-122.644
HYD44	WPCL	45.5857/-122.76
HYD45	YEON	45.5462/-122.71
K77S	HOBBY FIELD AIRPORT	43.9308/-123.007
KCMO3	KELLOGG CREEK NEAR MILWAUKIE 1SE	45.4317/-122.628
KCZK	CASCADE LOCKS STATE	45.6667/-121.883
KMMV	MCMINNVILLE, MCMINNVILLE MUNICIPAL AIRPORT	45.1961/-123.132
KPQR	PORTLAND - NWS WFO	45.5606/-122.538
KSLE	SALEM - MCNARY FIELD	44.9049/-123.001
KSPB	SCAPPOOSE INDUSTRIAL AIRPARK	45.7691/-122.864
KTTD	PORTLAND, PORTLAND-TROUTDALE AIRPORT	45.5511/-122.409
MRRO3	MOMPANO RESRVOIR ON ABERNATHY CREEK NEAR REDLAND 2S	45.3142/-122.505
OD108	I5 NB AT WILLAMETTE RIVER BRIDGE MP191.79	44.039/-123.048
OD119	OR22 AT SANTIAM PARK MP25.44	44.7765/-122.563
OD150	OR34 EB AT PEORIA RD MP1.18	44.5637/-123.235
OD159	OR126 EB AT MCKENZIE MP47.14	44.1728/-122.227
OD163	I84 EB AT I205 MP5.62	45.5316/-122.568
OD164	US26 AT SYLVAN MP71.32	45.5084/-122.736
OD166	JOHNSON CREEK BLVD AT HUNTER BLUFF CL CNTY	45.4561/-122.563
OD172	I205 SB AT GOV ISLAND MP25.6	45.5835/-122.544
OD173	WALLY ROAD RADIO TOWER BORING CL CNTY	45.4342/-122.39
OD178	I5 SB AT MARINE DR MP307.3	45.6037/-122.683
OD179	I205 NB AT WILLAMETTE VIEWPOINT MP7.61	45.3512/-122.628

Station ID	Station	Latitude/Longitude
OD190	OR22 AT EOLA EB MP21.93	44.9307/-123.114
ODA10	CRESWELL AIRPORT	43.9265/-123.006
ODT07	I205 SB AT GLENN JACKSON BRIDGE MP25	45.5752/-122.546
ODT08	I205 NB AT GLENN JACKSON BRIDGE MP26.4	45.5914/-122.547
ODT10	I405 SB AT FREMONT BRIDGE (WEST END) MP3.14	45.5368/-122.684
ODT11	FREMONT BRIDGE EAST (I-405 MP 3)	45.5391/-122.681
ODT12	US26 EB AT ZOO BRIDGE MP72.3	45.5069/-122.719
ODT14	I205 NB AT DIVISION ST RAMP MP19.61	45.5025/-122.565
ODT29	I84 WB AT SANDY RIVER MP17.5	45.5448/-122.388
ODT47	I5 NB AT ENCHANTED WAY MP246.99	44.8245/-123.016
ODT63	OR99E NB AT CANEMAH MP14.2	45.3423/-122.635
ODT78	I84 WB AT CASCADE LOCKS MP44.57	45.6693/-121.885
ODT93	US30 EB AT LEWIS/CLARK BR HWY2W MP48.68	46.096/-122.969
ODT95	US30 WB AT BOAT BASIN RD MP16.58	45.6954/-122.871
ORCO3	WILLAMETTE RIVER BELOW OREGON CITY FALLS	45.3578/-122.61
RRWO3	ROOSTER ROCK	45.5422/-122.291
TARO3	NRAWS 4 (TANNER)	45.6126/-121.943
TCFO3	TROUT CREEK	44.1111/-122.577
TDEOR	TROUTDALE OR	45.55/-122.39
TT483	MCKENZIE PORTABLE	44.1595/-122.253
UP112	BRIDAL	45.5414/-122.238
UP123	CASCDW	45.6548/-121.905
UP220	DODSON	45.6294/-121.966
UP335	HUBBRD	45.1703/-122.822
UR053	MILRBG	44.7079/-123.037
UR054	MINNOW	43.8779/-122.703
UR055	NATRON	44.031/-122.934
UR057	PRKPLC	45.3791/-122.581
UR060	SWAIN	44.1493/-123.183
WLOOX	WLOO LEBANON	44.5234/-122.738
WRNO3	WARRENDALE WATER QUALITY STATION	45.6/-122.053

Appendix B Continuous stream temperature data summary

Table 50: Continuous temperature monitoring stations in the Willamette River mainstem and major tributaries QAPP project area currently available in public databases and DEQ files.

Station ID	Station	Latitude/Longitude	Organization
10340-ORDEQ	Willamette River at I-5 (Wilsonville)	45.2918/-122.769	DEQ
10344-ORDEQ	Willamette River at Wheatland Ferry	45.0903/-123.045	DEQ
10347-ORDEQ	Willamette River at South River Road (Independence)	44.8456/-123.18	DEQ
10349-ORDEQ	Willamette River at Conser Road (Albany)	44.6874/-123.119	DEQ
10359-ORDEQ	Willamette River at Hwy 126 (Springfield)	44.0455/-123.028	DEQ
10362-ORDEQ	Pudding River at Arndt Road (Barlow)	45.2596/-122.739	DEQ
10363-ORDEQ	Yamhill River at Dayton	45.2231/-123.072	DEQ
10365-ORDEQ	Santiam River at I-5 Freeway	44.7378/-123.052	DEQ
10366-ORDEQ	South Santiam River Hwy 226 (Crabtree)	44.6305/-122.924	DEQ
10375-ORDEQ	Long Tom River at Monroe	44.3132/-123.296	DEQ
10380-ORDEQ	Coast Fork Willamette River at Creswell	43.9145/-122.994	DEQ
10381-ORDEQ	Coast Fork Willamette River at Saginaw Bridge	43.8327/-123.042	DEQ
10636-ORDEQ	Molalla River at mouth	45.2996/-122.721	DEQ
10637-ORDEQ	Molalla River at Knights Bridge Road (Canby)	45.2675/-122.71	DEQ
10658-ORDEQ	Luckiamute River at Lower Bridge	44.7302/-123.162	DEQ
10784-ORDEQ	Crabtree Creek at Riverside School Road	44.6734/-122.918	DEQ
10787-ORDEQ	Mcdowell Creek at Bench Mark 456	44.461/-122.768	DEQ
10792-ORDEQ	North Santiam River at Greens Bridge	44.7083/-122.973	DEQ

Station ID	Station	Latitude/Longitude	Organization
10856-ORDEQ	Johnson Creek at SE 122nd Avenue (Portland)	45.4737/-122.536	DEQ
10881-ORDEQ	Molalla River at Hwy 213 Bridge (Mulino)	45.1999/-122.581	DEQ
10886-ORDEQ	Mill Creek at Ehuen Road Bridge (Aurora)	45.2334/-122.757	DEQ
10917-ORDEQ	Pudding River at Hwy 99E (Aurora)	45.2337/-122.75	DEQ
11102-ORDEQ	Rickreall Creek at State Farm Road	44.9308/-123.129	DEQ
11137-ORDEQ	Ferguson Creek at Territorial Road	44.2476/-123.287	DEQ
11138-ORDEQ	Bear Creek at Territorial Hwy (Junction City)	44.2186/-123.287	DEQ
11140-ORDEQ	Long Tom River at Stow Pit Road (Monroe)	44.3428/-123.295	DEQ
11201-ORDEQ	Columbia Slough at Landfill Road	45.6107/-122.755	DEQ
11321-ORDEQ	Johnson Creek at SE 17th Avenue (Portland)	45.4467/-122.643	DEQ
13046-ORDEQ	Clackamas River at Barton Park Bridge	45.3819/-122.414	DEQ
21838-ORDEQ	Glenn Creek at River Mile 5.45	44.9475/-123.103	DEQ
23774-ORDEQ	Hamilton Creek at Upper Berlin Road near Berlin Ridge Road	44.4974/-122.75	DEQ
23775-ORDEQ	Hamilton Creek at Belinger Scale Road at golf course	44.5135/-122.798	DEQ
23777-ORDEQ	McDowell Creek at 5.7 miles up McDowell Creek Road	44.461/-122.717	DEQ
23807-ORDEQ	Columbia River Mid-Channel at Marker 28	45.7095/-122.766	DEQ
23809-ORDEQ	Columbia River at Marker 14	45.6076/-122.624	DEQ
23859-ORDEQ	Ferguson Creek at River Mile 8.4, at Ferguson Road (Long Tom, Willamette)	44.2655/-123.394	DEQ

Station ID	Station	Latitude/Longitude	Organization
24338-ORDEQ	North Santiam River at River Drive, irrigation access ramp in Norpac field	44.7716/-122.826	DEQ
24339-ORDEQ	Santiam River upstream of Jefferson Treatment Plant	44.7228/-123.015	DEQ
24571-ORDEQ	Chehulpum Creek downstream of Talbot Slough, 50 yards upstream of RR bridge (Santiam)	44.7473/-123.094	DEQ
24572-ORDEQ	Chehulpum Creek at Interstate 5, Talbot Road, exit (Santiam)	44.7582/-123.049	DEQ
24574-ORDEQ	Marion Creek at Jefferson-Marion Road Bridge, next to Pletzer Road (Santiam)	44.7358/-122.947	DEQ
25270-ORDEQ	Amazon Creek, tributary to Long Tom River, at High Pass Road	44.2151/-123.25	DEQ
25271-ORDEQ	Long Tom River below Fern Ridge Spillway	44.1213/-123.301	DEQ
25370-ORDEQ	Long Tom River just below bridge at Franklin Road	44.1544/-123.292	DEQ
25373-ORDEQ	Long Tom River at Bundy Bridge near mouth	44.3802/-123.249	DEQ
25381-ORDEQ	Chehalem Creek tributary	45.337/-123.055	DEQ
25533-ORDEQ	Clackamas River at the Carver Bridge	45.3928/-122.497	DEQ
25773-ORDEQ	Coyote Creek at mouth near Franklin Road	44.1533/-123.291	DEQ
25808-ORDEQ	Lost Creek near 38404 Dexter Road, Dexter (River Mile 1.6), Middle Fork Willamette	43.929/-122.842	DEQ
25809-ORDEQ	Lost Creek downstream of Guiley Creek	43.8512/-122.795	DEQ
25811-ORDEQ	Lost Creek at River Mile 11.7	43.8171/-122.757	DEQ
25817-ORDEQ	Santiam River 0.75 miles downstream of confluence	44.6954/-123.017	DEQ
25975-ORDEQ	Stout Creek at mouth (North Santiam, Willamette)	44.7805/-122.66	DEQ

Station ID	Station	Latitude/Longitude	Organization
25976-ORDEQ	North Santiam River just upstream of Stout Creek (Willamette)	44.7805/-122.659	DEQ
25977-ORDEQ	North Santiam River downstream of Stout Creek (Willamette)	44.778/-122.676	DEQ
25978-ORDEQ	North Santiam River just upstream of Bear Branch (Willamette)	44.7589/-122.857	DEQ
25980-ORDEQ	North Santiam River upstream of Marion Creek (Willamette)	44.7206/-122.956	DEQ
25981-ORDEQ	Bear Branch at Shelburn Drive (North Santiam, Willamette)	44.753/-122.85	DEQ
25984-ORDEQ	Santiam River upstream of Chehulpum Creek (Talbot Slough) (Willamette)	44.7461/-123.087	DEQ
25985-ORDEQ	North Santiam River approximately 1 mile downstream of Bear Branch (Willamette)	44.7509/-122.877	DEQ
25986-ORDEQ	North Santiam River at approximately River Mile 20.5, Miller's Farm (Willamette)	44.7884/-122.719	DEQ
25987-ORDEQ	North Santiam River near N. Santiam State Park, 46559 Tuckwila Street (Willamette)	44.7681/-122.558	DEQ
26624-ORDEQ	Lost Creek at River Mile 7.8 (Willamette, Middle Fork Willamette)	43.8567/-122.801	DEQ
26625-ORDEQ	Lost Creek at headwaters, 5.5 meters up Bear Boulevard (Willamette, Middle Fork Willamette)	43.8011/-122.766	DEQ
26626-ORDEQ	Lost Creek downstream of Wagner Creek (Willamette, Middle Fork Willamette)	43.9038/-122.824	DEQ
26627-ORDEQ	Lost Creek at mouth, Elijah Bristow Stata Park (Willamette, Middle Fork Willamette)	43.9492/-122.849	DEQ

Station ID	Station	Latitude/Longitude	Organization
26628-ORDEQ	Lost Creek at Elijah Bristow State Park, pond at property line (Willamette, Middle Fork,Willamette)	43.9404/-122.844	DEQ
26629-ORDEQ	Lost Creek at Lost Creek Road (Willamette, Middle Fork, Willamette)	43.8821/-122.816	DEQ
26745-ORDEQ	Willamette River at Roehr Waterfront Park	45.4156/-122.658	DEQ
26747-ORDEQ	Columbia River downstream of Multnomah Channel	45.8692/-122.795	DEQ
26749-ORDEQ	Long Tom River near River Mile 19.8	44.1768/-123.278	DEQ
26750-ORDEQ	Long Tom River near River Mile 12.3	44.2652/-123.272	DEQ
26751-ORDEQ	North Santiam River at River Mile 47.6 - Detroit Lake Tailrace	44.7255/-122.255	DEQ
26752-ORDEQ	Columbia River at River Mile 122.5	45.5769/-122.379	DEQ
26753-ORDEQ	Willamette River near River Mile 147	44.4005/-123.226	DEQ
26754-ORDEQ	Columbia River near River Mile 66.8	46.0988/-122.937	DEQ
26755-ORDEQ	Willamette River above Long Tom River	44.3654/-123.221	DEQ
26756-ORDEQ	Santiam River near mouth	44.7496/-123.139	DEQ
26757-ORDEQ	McKenzie River at Bellinger Landing	44.0698/-122.906	DEQ
26758-ORDEQ	McKenzie River at River Mile 26.6 - Deerhorn	44.0889/-122.724	DEQ
26759-ORDEQ	Mill Creek at River Mile 2.2 at State Street, Salem	44.9345/-123.017	DEQ
26760-ORDEQ	Multnomah Channel downstream of Gilbert River	45.7367/-122.841	DEQ
26761-ORDEQ	North Santiam River near River Mile 31.3	44.7647/-122.524	DEQ
26770-ORDEQ	McKenzie River at River Mile 49.0, below Couger River	44.1232/-122.384	DEQ

Station ID	Station	Latitude/Longitude	Organization
26772-ORDEQ	Willamette River at River Mile 141.7	44.4547/-123.211	DEQ
26773-ORDEQ	Tualatin River at West Linn near SW Borland Road	45.3506/-122.677	DEQ
26774-ORDEQ	South Santiam River at River Mile 0.5	44.6813/-123.001	DEQ
28088-ORDEQ	Hills Creek	43.9942/-122.809	DEQ
28089-ORDEQ	Anthony Creek	43.8743/-122.861	DEQ
28091-ORDEQ	Guiley Creek	43.8372/-122.794	DEQ
28092-ORDEQ	Little Falls Creek 2	43.9858/-122.726	DEQ
28093-ORDEQ	Lost Creek	43.9925/-122.779	DEQ
28094-ORDEQ	Middle Creek	43.8674/-122.822	DEQ
28108-ORDEQ	Bear Creek	44.1328/-122.483	DEQ
28110-ORDEQ	Cedar Creek - tributary	44.039/-122.833	DEQ
28111-ORDEQ	Camp Creek	44.1218/-122.788	DEQ
28114-ORDEQ	Deer Creek	44.1092/-122.455	DEQ
28115-ORDEQ	Finn Creek	44.1687/-122.623	DEQ
28254-ORDEQ	Willamette River upstream of Rickreall Creek	44.9265/-123.112	DEQ
28255-ORDEQ	Willamette River upstream of WLTP outfall	45.0077/-123.072	DEQ
28256-ORDEQ	North Santiam River at Geren Station (Stayton Island), Salem Water Plant #2 intake	44.7912/-122.75	DEQ
28278-ORDEQ	Lost Creek at River Mile 9.4 (Willamette, Middle Fork Willamette)	43.8431/-122.78	DEQ
28468-ORDEQ	Springbrook Creek upstream of Wilsonville Road	45.2903/-122.941	DEQ
28477-ORDEQ	Hawn Creek (tributary to Yamhill River)	45.2783/-123.148	DEQ
28485-ORDEQ	Chehalem Creek upstream of Dopp Road	45.3237/-123.068	DEQ
28486-ORDEQ	Chehalem Creek upstream of Ewing Young Park	45.2897/-122.98	DEQ
28504-ORDEQ	McKenzie River at Helfrich Boat Ramp, 1.8 miles upstream of Gate Creek	44.1274/-122.535	DEQ

Station ID	Station	Latitude/Longitude	Organization
28505-ORDEQ	McKenzie River at Dearborn Island, upstream of South Fork McKenzie River	44.1684/-122.24	DEQ
28506-ORDEQ	Willamette River at River Mile 18.8 - north fo Deer Island	45.438/-122.647	DEQ
28507-ORDEQ	Willamette River at River Mile 18.7 - upstream of Kellogg outfall	45.4393/-122.645	DEQ
28508-ORDEQ	Willamette River at River Mile 18.5 - downstream of Kellogg outfall	45.4405/-122.644	DEQ
28573-ORDEQ	Long Tom River at Hwy 36	44.1905/-123.278	DEQ
28616-ORDEQ	Middle Santiam River below Green Peter Reservoir at Old Fish Facility	44.4482/-122.55	DEQ
28713-ORDEQ	Mill Creek at Turner Road (tributary to Willamette River at River Mile 84)	44.8812/-122.978	DEQ
28723-ORDEQ	Willamette River upstream of McKenzie River at River Mile 177	44.095/-123.108	DEQ
28724-ORDEQ	Middle Fork Willamette near mouth	44.0236/-123.02	DEQ
28765-ORDEQ	Willamette River at St. John’s RR Bridge, City of Portland site	45.5773/-122.747	DEQ
28818-ORDEQ	Blue Lake (Multnomah Co) Fishing Dock	45.5539/-122.447	DEQ
28901-ORDEQ	Hess Creek upstream of Fulton Street (Yamhill, Willamette)	45.3069/-122.966	DEQ
28961-ORDEQ	Mill Creek at Front Street NE, Salem (tributary to Willamette River at River Mile 84)	44.9507/-123.037	DEQ
28964-ORDEQ	Clark Creek at mouth (tributary to Pringle Creek at River Mile 1.05)	44.9269/-123.033	DEQ
29642-ORDEQ	North Santiam River at River Mile 12.2	44.7699/-122.847	DEQ

Station ID	Station	Latitude/Longitude	Organization
29746-ORDEQ	Willamette River upstream of Oregon Steel Mills - City of Portland site	45.6217/-122.791	DEQ
30334-ORDEQ	South Fork Goble Creek	46.0024/-122.9	DEQ
30437-ORDEQ	Clear Creek at mouth (tributary to Clackamas River at River Mile 8.2)	45.3927/-122.495	DEQ
30438-ORDEQ	Deep Creek at mouth (tributary to Clackamas River at River Mile 12.2)	45.3899/-122.432	DEQ
30439-ORDEQ	Clackamas River upstream of Eagle Creek	45.3519/-122.384	DEQ
30440-ORDEQ	Eagle Creek at mouth (tributary to Clackamas River at River Mile 16.7)	45.3533/-122.382	DEQ
30441-ORDEQ	Clackamas River at lower Milo McIver Park boat launch	45.3123/-122.38	DEQ
30442-ORDEQ	Estacada Lake near spillway (PGE site)	45.2766/-122.323	DEQ
30501-ORDEQ	Middle Fork Willamette River just below Lookout Point Dam	43.9142/-122.757	DEQ
30532-ORDEQ	Gosage Creek (tributary to Goodman, to MFW 26.2)	43.8444/-122.682	DEQ
30533-ORDEQ	Little Fall Creek at River Mile 7.6	43.9925/-122.694	DEQ
30534-ORDEQ	Lost Creek at River Mile 9.3 (tributary to MFW 13.5)	43.8425/-122.782	DEQ
30628-ORDEQ	Tanner Creek	45.622/-121.952	DEQ
31022-ORDEQ	Rainer Fire Station	46.0888/-122.938	DEQ
31075-ORDEQ	Portland Cully Helensview	45.5625/-122.575	DEQ
31377-ORDEQ	Big Creek	45.5106/-122.285	DEQ
31382-ORDEQ	Tryon Creek	45.4314/-122.673	DEQ
31390-ORDEQ	Tide Creek	45.9621/-122.949	DEQ
31403-ORDEQ	Abernethy Creek	45.3255/-122.508	DEQ
31405-ORDEQ	Milton Creek upper	45.8899/-122.924	DEQ
31876-ORDEQ	Mill Creek Ehlen Road	45.2333/-122.757	DEQ
32058-ORDEQ	Molalla River at Canby-Marquam Hwy (Goods Bridge)	45.2443/-122.688	DEQ

Station ID	Station	Latitude/Longitude	Organization
32059-ORDEQ	Molalla River at 22nd Avenue	45.2805/-122.711	DEQ
32060-ORDEQ	Mill Creek upstream of Hubbard STP (Pudding River)	45.186/-122.814	DEQ
32061-ORDEQ	Molalla River upstream of Milk Creek	45.2377/-122.658	DEQ
32062-ORDEQ	Molalla River North of Oak Grove Road	45.2189/-122.605	DEQ
32645-ORDEQ	Davidson Creek at River Mile 0.05 (Ferguson Creek, Long Tom River, Upper Willamette)	44.2635/-123.396	DEQ
32649-ORDEQ	Owens Creek at High Pass Rd near Templeton Rd, RM 4.23 (Bear Crk, Long Tom R, Upper Willamette)	44.2203/-123.373	DEQ
32651-ORDEQ	Owens Creek at RM 3.96 off High Pass Rd ~ 0.3 miles D/S Lavell Rd (Bear Crk to Long Tom R)	44.2195/-123.367	DEQ
32653-ORDEQ	Turnbow Creek at High Pass Road, RM 0.88 (Owens Creek, Bear Creek, Long Tom R., Upper Willamette)	44.2231/-123.346	DEQ
32655-ORDEQ	Owens Creek at RM 3.86 off High Pass Rd, ~ 0.4 miles D/S Lavell Rd (Bear Crk to Long Tom R)	44.2192/-123.365	DEQ
32656-ORDEQ	Ferguson Creek at River Mile 7.7 (Long Tom River, Upper Willamette)	44.255/-123.381	DEQ
32657-ORDEQ	Bear Creek at River Mile 0.69 (Ferguson Creek, Long Tom River, Upper Willamette)	44.2213/-123.278	DEQ
32659-ORDEQ	Bear Creek at River Mile 0.57 (Ferguson Creek, Long Tom River, Upper Willamette)	44.2217/-123.276	DEQ
33477-ORDEQ	Willamette River tributary at River Mile 0.3	45.4687/-122.68	DEQ
33485-ORDEQ	Croisan Creek	44.8771/-123.085	DEQ
33488-ORDEQ	Claggett Creek	44.9904/-123.015	DEQ

Station ID	Station	Latitude/Longitude	Organization
33491-ORDEQ	McNulty Creek	45.8458/-122.831	DEQ
33496-ORDEQ	Willamette tributary near Wilsonville	45.3144/-122.747	DEQ
33506-ORDEQ	Periwinkle Creek	44.6105/-123.062	DEQ
33512-ORDEQ	Clark Creek, Salem	44.9204/-123.035	DEQ
33517-ORDEQ	Columbia Slough	45.5882/-122.643	DEQ
33518-ORDEQ	Miller Creek	45.6076/-122.817	DEQ
33519-ORDEQ	Jackson Creek	44.6138/-123.276	DEQ
33521-ORDEQ	Dunawi Creek	44.5503/-123.292	DEQ
33523-ORDEQ	Abernathy Creek	45.3626/-122.593	DEQ
33524-ORDEQ	Columbia Slough	45.5882/-122.68	DEQ
33643-ORDEQ	Goble Creek upstream of South Fork Goble Creek (Columbia)	46.004/-122.903	DEQ
33744-ORDEQ	Lost Creek at headwaters, Mount June, 10.9 miles from Bear Boulevard (Willamette)	43.7988/-122.708	DEQ
33832-ORDEQ	Willamette River	44.0468/-123.058	DEQ
33833-ORDEQ	McKenzie River	44.1166/-123.065	DEQ
33834-ORDEQ	North Santiam River	44.7201/-122.953	DEQ
33840-ORDEQ	Row River at River Mile 2.5 near Cottage Grove	43.7904/-123.024	DEQ
33854-ORDEQ	Willamette River at River Mile 115 near Millersburg	44.6755/-123.102	DEQ
33855-ORDEQ	Tualatin River at River Mile 1.5 near West Linn	45.3457/-122.672	DEQ
34202-ORDEQ	Multnomah Channel US Santosh Slough (Columbia)	45.8045/-122.821	DEQ
34203-ORDEQ	Milton Creek 0.2 miles US of Old Portland Rd (Scappoose Bay)	45.8507/-122.818	DEQ
34207-ORDEQ	Scappoose Creek 0.5 miles US of West Lane Rd	45.7761/-122.871	DEQ
34209-ORDEQ	Scappoose Bay at Marker #3 (Multnomah, Columbia)	45.8295/-122.829	DEQ
34489-ORDEQ	Q Street Canal, 75 feet u/s of Dynea outfall	44.0536/-122.986	DEQ

Station ID	Station	Latitude/Longitude	Organization
34490-ORDEQ	Q Street Canal, 30 feet d/s of Dynea outfall (concrete pipe near concrete structure)	44.0539/-122.986	DEQ
34491-ORDEQ	Q Street Canal, 50 feet u/s of Pierce Channel mouth	44.0616/-122.996	DEQ
34492-ORDEQ	Q Street Canal, mouth of Pierce Channel	44.0616/-122.997	DEQ
34496-ORDEQ	Q Street Canal, 10 feet u/s of fish barrier	44.0626/-123.041	DEQ
34498-ORDEQ	Q Street Canal, mouth of Canoe Channel	44.0585/-123.077	DEQ
34499-ORDEQ	Q Street Canal, Alton Baker Parkway spillway near Willamette River	44.0569/-123.083	DEQ
34513-ORDEQ	Q Street Canal, 30 feet d/s of Asphalt Composting Company bridge	44.0542/-122.986	DEQ
35083-ORDEQ	Yamhill River at LaFayette Hwy.	45.2395/-123.115	DEQ
35913-ORDEQ	Clark Creek at Ewald Ave (Pringle Cr Trib)	44.9011/-123.051	DEQ
35914-ORDEQ	Pringle Creek at Pringle Park (Willamette)	44.9343/-123.038	DEQ
35916-ORDEQ	East Fork of Pringle Creek at Trelstad Ave. (Willamette)	44.8853/-122.987	DEQ
35917-ORDEQ	Mill Creek at North Salem High School	44.9423/-123.024	DEQ
35923-ORDEQ	Glenn Creek at Wallace Rd.	44.9655/-123.058	DEQ
37229-ORDEQ	Bear Branch at Huntley Rd	44.7677/-122.745	DEQ
37300-ORDEQ	Gettings Cr at Sears Rd	43.8366/-123.025	DEQ
37365-ORDEQ	Errol Springs Creek at mouth off SE 42nd St. (T-23)	45.4635/-122.618	DEQ
37376-ORDEQ	Spring Creek at mouth, outlet to Johnson Creek near Hwy. 224 (T-37)	45.4487/-122.643	DEQ
37377-ORDEQ	Spring Creek at Harrison Road, Milwaukie, OR	45.446/-122.64	DEQ

Station ID	Station	Latitude/Longitude	Organization
37384-ORDEQ	veterans & Cottonwood Creeks at confl. w/Johnson Creek, east of I-205	45.4687/-122.565	DEQ
38674-ORDEQ	Johnson Cr abv Trib at EB 224 on ramp	45.4492/-122.643	DEQ
38675-ORDEQ	Johnson Cr below Trib at SB 99E exit to EB hwy 224	45.4485/-122.643	DEQ
38680-ORDEQ	Wahoo Cr blw SE Flavel St (Johnson Cr Trib)	45.4688/-122.528	DEQ
38755-ORDEQ	Spring Creek u/s of Portland Waldorf School in Milwaukie	45.4462/-122.638	DEQ
38759-ORDEQ	Johnson Cr Trib Deardorff Cr at Mouth	45.4712/-122.525	DEQ
39130-ORDEQ	Milton Cr DS of Old Portland Rd on Boise Cascade side of road	45.8506/-122.814	DEQ
39204-ORDEQ	Johnson Creek near mouth at spring inlet	45.4452/-122.643	DEQ
39446-ORDEQ	Flat Cr US Junction City outfall (RM 9.5)	44.2183/-123.23	DEQ
39447-ORDEQ	Flat Cr at Ferguson Rd (RM 6.7)	44.2533/-123.242	DEQ
39448-ORDEQ	Flat Cr at 99W (RM 5.2)	44.27/-123.235	DEQ
39449-ORDEQ	Flat Cr at Old River Rd (RM 2.5)	44.2955/-123.239	DEQ
39450-ORDEQ	Flat Cr at Cox Butte Rd (RM 8.0)	44.237/-123.235	DEQ
40069-ORDEQ	McDowell Creek at Berlin Road	44.4709/-122.744	DEQ
40070-ORDEQ	Hamilton Creek at Upper Berlin Rd	44.5009/-122.729	DEQ
40073-ORDEQ	Ferguson Creek 0.1 miles upstream of Eber Creek confluence	44.2533/-123.375	DEQ
40087-ORDEQ	Ferguson Creek SFK at RM 0.48	44.2463/-123.379	DEQ
40088-ORDEQ	Ferguson Ck 270 Meters DS SFK Mouth	44.2485/-123.368	DEQ
40089-ORDEQ	Ferguson CK 0.1 Miles DS of Territorial RD	44.2478/-123.285	DEQ

Station ID	Station	Latitude/Longitude	Organization
40090-ORDEQ	Turnbow Creek 0.6 miles US of Owens Creek confluence	44.2184/-123.341	DEQ
40091-ORDEQ	Owen's CK 0.3 miles US of Turnbow CK confluence	44.2132/-123.341	DEQ
40092-ORDEQ	Owens Ck US of Bear CK confluence	44.1944/-123.307	DEQ
40094-ORDEQ	Gettings CK 60 yds DS of crossing	43.8474/-123.017	DEQ
40109-ORDEQ	Unnamed stream at RM 0.41	43.8567/-122.986	DEQ
40239-ORDEQ	Johnson Creek DS from Harrison St outfall	45.4449/-122.643	DEQ
40316-ORDEQ	Milton Creek 85 m below W Kappler Rd	45.8641/-122.887	DEQ
40371-ORDEQ	Gettings Creek North Fork DS of Witcher Gateway Rd	43.8367/-123.014	DEQ
40791-ORDEQ	McDowell Ck at Speasl Rd	44.458/-122.707	DEQ
40792-ORDEQ	Hamilton Ck at 1170m upstream of Bellinger Scale Rd	44.51/-122.789	DEQ
40971-ORDEQ	Crystal Springs Creek downstream of pond at base of fish ladder	45.4824/-122.633	DEQ
40972-ORDEQ	Crystal Springs Creek 300 ft downstream	45.4823/-122.633	DEQ
COG_ArrowMouth	Arrow Creek at mouth at Division	45.4972/-122.378	City of Gresham
COG_BCI1	Beaver Creek at Canyon footbridge	45.5312/-122.381	City of Gresham
COG_BCI2	Beaver Creek at Division Street and Troutdale Road	45.4973/-122.378	City of Gresham
COG_BeaveratCoch	Beaver Creek at Cochran Road	45.5101/-122.39	City of Gresham
COG_BeaveratGlenO	Beaver Creek at Glen Otto park	45.5374/-122.379	City of Gresham
COG_BeaveratStark	Beaver Creek at Stark Street	45.5187/-122.389	City of Gresham
COG_BeaverDSKelly	Beaver Creek downstream of confluence with Kelly Creek	45.5143/-122.391	City of Gresham

Station ID	Station	Latitude/Longitude	Organization
COG_BeaverUSKelly	Beaver Creek upstream of confluence with Kelly Creek	45.5136/-122.391	City of Gresham
COG_BeDSBeavDamA	Beaver Creek on MHCC campus downstram of beaver dam	45.5157/-122.391	City of Gresham
COG_BeUSBeavDamA	Beaver Creek on MHCC campus upstream of beaver dam	45.5154/-122.391	City of Gresham
COG_Burl@Culvert	Burlingame Creek at ditch from culvert on Hogan	45.5077/-122.414	City of Gresham
COG_Burl@Golf	Burlingame Creek on Gresham Golf Course upstream of Kelly Creek	45.5111/-122.403	City of Gresham
COG_Burl@Hogan	Burlingame Creek at Hogan Road	45.509/-122.414	City of Gresham
COG_BurlatHogan	Burlingame Creek at Hogan Road	45.509/-122.414	City of Gresham
COG_Fairv@Birdsd	Fairview Creek at Birdsdale Road	45.5087/-122.455	City of Gresham
COG_Fairv@Glisan	Fairview Creek at Glisan Road	45.5277/-122.449	City of Gresham
COG_FairvatBirdsd	Fairview Creek at Birdsdale Road	45.5087/-122.455	City of Gresham
COG_FairvatDivision	Fairview Creek at Division Street	45.5049/-122.46	City of Gresham
COG_FairvatGlisan	Fairview Creek at Glisan Road	45.5277/-122.449	City of Gresham
COG_FCI0	Fairview Creek at Eastman Parkway	45.5456/-122.436	City of Gresham
COG_FCI1	Fairview Creek at Stark Street	45.5211/-122.451	City of Gresham
COG_KCI1	Kelly Creek downstream of MHCC pond	45.5135/-122.395	City of Gresham
COG_KCI2	Kelly Creek upstream MHCC pond	45.5124/-122.399	City of Gresham
COG_KCI3	Kelly Creek downstream of Kelley Creek detention pond	45.4868/-122.383	City of Gresham
COG_KCI4	Kelly Creek at Ironwood Drive	45.4846/-122.378	City of Gresham
COG_KellyatKane	Kelly Creek at Kane Drive	45.5121/-122.401	City of Gresham

Station ID	Station	Latitude/Longitude	Organization
COG_KellyUSGolf	Kelly Creek upstream of Gresham Golf Course	45.5094/-122.402	City of Gresham
VNB	Columbia Slough at Portland, OR, N Vancouver St Bridge (Main Channel - Columbia Slough)		City of Portland
CGT1	Claggett Creek at Mainline Dr NE	44.9822/-123.009	City of Salem
CGT5	Claggett Creek at Hawthorne St NE	44.9793/-122.993	City of Salem
CLK1	Clark Creek at Bush Park	44.9268/-123.034	City of Salem
CLK12	Clark Creek at Ewald Ave.	44.9012/-123.052	City of Salem
CRO1	Croisan Creek at Courthouse Athletic Club	44.9134/-123.069	City of Salem
CRO10	Croisan Creek at Ballantyne Rd S	44.8797/-123.083	City of Salem
GIB1	Gibson Creek at Wallace Rd NW	44.9748/-123.069	City of Salem
GIB15	Gibson Creek at Brush College Rd NW	44.9758/-123.092	City of Salem
GLE12	Glenn Creek at Hidden Valley Rd.	44.9475/-123.102	City of Salem
GLE3	Glenn Creek at Wallace Rd.	44.9653/-123.058	City of Salem
MIC12	Mill Creek at Turner Rd.	44.8813/-122.977	City of Salem
MIC3	Mill Creek at North Salem High School	44.9424/-123.024	City of Salem
MRA1	Mill Race at High St SE	44.9373/-123.039	City of Salem
MRA10	Mill Race at Mill Race Park	44.9337/-123.018	City of Salem
PRI12	East Fork of Pringle Creek at Trelstad Ave.	44.8853/-122.987	City of Salem
PRI3	Pringle Creek at Pringle Park	44.9341/-123.038	City of Salem
SHE1	Shelton Ditch at Church St SE	44.9348/-123.038	City of Salem
SHE10	Shelton Ditch at State Printing Office	44.9245/-123	City of Salem
26B070	Cowlitz River at Kelso	46.1454/-122.914	DOE
27B070	Kalama River near Kalama	46.0476/-122.838	DOE
27C080	Lewis River at Co Rd 16	45.9058/-122.736	DOE

Station ID	Station	Latitude/Longitude	Organization
EMSWCD_BCB	Beaver Creek North Fork at 302nd Ave	45.4972/-122.353	EMSWCD
EMSWCD_BCC	Beaver Creek South Fork at 302nd Ave	45.4888/-122.353	EMSWCD
EMSWCD_Beaver_Cory	Beaver Creek at confluence of North and South Forks	45.4958/-122.366	EMSWCD
EMSWCD_Beaver_Freuler	Beaver Creek South Fork downstream of BCC	45.4895/-122.357	EMSWCD
EMSWCD_Big_Black	Big Creek at Hurlburt Rd.	45.5084/-122.287	EMSWCD
EMSWCD_Big_Fishel_Howard	Howard Creek upstream up Littlepage Rd.	45.5135/-122.282	EMSWCD
EMSWCD_Big_Fishel_Main	Big Creek downstream of confluence of all major tributaries.	45.5124/-122.284	EMSWCD
EMSWCD_Big_Fishel_Pounder	Pounder Creek at Pounder Rd.	45.5139/-122.283	EMSWCD
EMSWCD_Smith_Guebert	Smith Creek by Hurlburt Rd.	45.5101/-122.313	EMSWCD
EMSWCD_Smith_Murphy	Smith Creek downstream of Christensen Rd.	45.5154/-122.326	EMSWCD
EMSWCD_Smith_Spencer	Smith Creek downstream of Northway Rd.	45.515/-122.333	EMSWCD
CRU	Columbia River Upstream of Outfall 001	45.6213/-122.689	Portland Environmental Services
P0012	Tributary to Stevens Creek downstream of SW Custer St	45.4687/-122.679	Portland Environmental Services
P0017	Elrod Slough downstream of Columbia River Correctional Institution	45.5885/-122.64	Portland Environmental Services
P0060	Veteran’s Creek at SE 101st Ave South of Mt. Scott Blvd	45.4643/-122.56	Portland Environmental Services
P0080	Upper Columbia Slough downstream of NE 185th Ave	45.5493/-122.478	Portland Environmental Services
P0124	Johnson Creek off SE Barbara Welch Rd near SE Foster Rd	45.4755/-122.516	Portland Environmental Services
P0129	Upper Columbia Slough Between 148th and 158th Ave	45.5573/-122.508	Portland Environmental Services

Station ID	Station	Latitude/Longitude	Organization
P0144	Nettle Creek East from Andrews Rd on Iron Mountain Trail	45.4292/-122.677	Portland Environmental Services
P0188	Johnson Creek downstream of SE 110th Dr	45.4739/-122.55	Portland Environmental Services
P0208	Tryon Creek off North Creek Trail South of SW Boones Ferry Rd	45.4446/-122.683	Portland Environmental Services
P0250	Balch Creek upstream of Lower Macleay Park	45.5323/-122.717	Portland Environmental Services
P0316	Veteran's Creek downstream of Lincoln Memorial Cemetery Pond	45.4601/-122.552	Portland Environmental Services
P0337	Lower Columbia Slough downstream of Vancouver Bridge	45.5866/-122.671	Portland Environmental Services
P0352	Johnson Creek upstream of SE Stanley Ave	45.4558/-122.603	Portland Environmental Services
P0524	Stephens Creek at Confluence with Willamette River	45.4688/-122.67	Portland Environmental Services
P0526	Tributary to Balch Creek at NW Thompson Rd upstream of Cornell Rd	45.5376/-122.739	Portland Environmental Services
P0529	Middle Columbia Slough across from Oregon Air National Guard	45.5744/-122.593	Portland Environmental Services
P0544	Johnson Creek downstream of SE Ochoco St	45.4582/-122.642	Portland Environmental Services
P0592	Tributary to Tryon Creek downstream of Red Fox Bridge	45.4365/-122.675	Portland Environmental Services
P0633	Newton Creek downstream of Newton Trail	45.6073/-122.797	Portland Environmental Services
P0705	Middle Columbia Slough upstream of Whitaker Slough Confluence	45.5789/-122.617	Portland Environmental Services
P0720	Riverview Tributary to Willamette River North of Lewis and Clark College	45.4534/-122.669	Portland Environmental Services

Station ID	Station	Latitude/Longitude	Organization
P0754	Falling Creek near SW Jonathan Ct	45.4565/-122.708	Portland Environmental Services
P0762	Balch Creek off Wildwood Trail near Stone House	45.5277/-122.726	Portland Environmental Services
P0800	Tributary to Willamette River upstream of Riverview Pump Station	45.4534/-122.663	Portland Environmental Services
P0828	Tributary to Johnson Creek along SE Deardorff Rd near covered bridge	45.471/-122.525	Portland Environmental Services
P0892	Johnson creek upstream of SE 100th Ave	45.4742/-122.56	Portland Environmental Services
P0961	Middle Columbia Slough upstream of NE 21st Ave	45.58/-122.641	Portland Environmental Services
P1020	Kelley Creek downstream of SE 159th Dr	45.4772/-122.499	Portland Environmental Services
P1104	Upper Columbia Slough downstream of NE 185th Ave	45.5488/-122.474	Portland Environmental Services
P1184	Johnson Creek at Eastside Plating 1,2,3	45.463/-122.636	Portland Environmental Services
P1212	Johnson Creek at Brookside Wetland	45.475/-122.547	Portland Environmental Services
P1292	Crystal Springs at 2215 SE Miller St	45.4669/-122.642	Portland Environmental Services
P1312	Riverview Tributary to Willamette River South of Lewis and Clark College	45.4495/-122.665	Portland Environmental Services
P1360	Wilkes Creek at NE 154th Ave	45.548/-122.504	Portland Environmental Services
P1376	Johnson Creek downstream of SE Bell Ave	45.4553/-122.594	Portland Environmental Services
P1404	Johnson Creek downstream of Leach Botanical Gardens	45.474/-122.537	Portland Environmental Services

Station ID	Station	Latitude/Longitude	Organization
P1473	Whitaker Slough near confluence with Middle Columbia Slough	45.5775/-122.62	Portland Environmental Services
P1593	Miller Creek downstream of Wildwood Trail	45.6122/-122.812	Portland Environmental Services
P1612	Johnson Creek near Errol Creek confluence	45.4634/-122.618	Portland Environmental Services
P1744	Riverview Tributary to Willamette River South of Riverview Cemetery	45.4595/-122.671	Portland Environmental Services
P1769	Miller Creek upstream of HWY 30	45.6168/-122.809	Portland Environmental Services
P1781	Lower Columbia Slough at Kelley Point Park	45.6417/-122.766	Portland Environmental Services
P1857	Upper Columbia Slough downstream of Big Four Corners	45.5553/-122.49	Portland Environmental Services
P1865	Lower Columbia Slough downstream of St. Johns Landfill Bridge	45.6131/-122.759	Portland Environmental Services
P1872	Nettle Creek West of Iron Mountain Bridge	45.4296/-122.675	Portland Environmental Services
P1916	Veteran’s Creek near 9908 SE Mt. Scott Blvd	45.4658/-122.562	Portland Environmental Services
P1936	Tributary to Arnold Creek at Boones Ferry Rd	45.4486/-122.687	Portland Environmental Services
P2000	Tryon Creek downstream of High Bridge	45.4404/-122.68	Portland Environmental Services
P2113	Middle Columbia Slough downstream of NE 92nd Dr	45.5663/-122.569	Portland Environmental Services
P2185	Rocking Chair Creek downstream of Leif Erikson Dr	45.5569/-122.751	Portland Environmental Services
P2208	Johnson Creek at Brookside Apartments	45.459/-122.613	Portland Environmental Services

Station ID	Station	Latitude/Longitude	Organization
P2318	Upper Balch Creek at NW Cornell Rd and 53rd Ave	45.5296/-122.734	Portland Environmental Services
P2377	Lower Columbia Slough downstream of N. Portland Rd	45.6032/-122.73	Portland Environmental Services
P2384	Tributary to Tryon Creek upstream of Cedar Trail	45.4349/-122.68	Portland Environmental Services
P2400	Johnson Creek upstream of SE Bell Ave	45.4565/-122.59	Portland Environmental Services
TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)	45.4469/-122.687	Portland Environmental Services
VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	45.585/-122.668	Portland Environmental Services
Beaver_0.0	Beaver Creek at Mouth	45.541/-122.383	Portland State University
Sandy_3.0	Sandy River Above Beaver Creek	45.5398/-122.379	Portland State University
PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	45.5289/-122.378	Portland Water Bureau
CRGNSA-001	Benson Lake_be20_LTWT	45.5779/-122.127	USFS
CRGNSA-002	Bridal Veil Temp Monitor	45.5561/-122.183	USFS
CRGNSA-004	Eagle Creek Lower ea74_LTWT	45.6411/-121.929	USFS
CRGNSA-007	Horsetail Water Temp Probe	45.5905/-122.069	USFS
CRGNSA-008	McCord Water Temp Monitor	45.6144/-121.997	USFS
CRGNSA-009	Moffett Water Temperature Monitor	45.623/-121.977	USFS
CRGNSA-011	Multnomah Creek mu15_LTWT	45.5787/-122.13	USFS
CRGNSA-012	Multnomah Creek Upper mu40_LTWT	45.5778/-122.12	USFS
CRGNSA-013	Oneonta Water Temp Probe	45.5899/-122.075	USFS

Station ID	Station	Latitude/Longitude	Organization
CRGNSA-015	Wahkeena Creek wa20_LTWT	45.5779/-122.13	USFS
WNF-021	Cone_WT	44.1611/-122.365	USFS
WNF-023	Cougar_WT	44.1386/-122.248	USFS
WNF-033	ElkNorth_WT	44.1559/-122.371	USFS
WNF-056	Indian_WT	44.0177/-122.3	USFS
WNF-062	Lytle_WT	44.027/-122.308	USFS
WNF-080	NFQuartz_WT	44.1866/-122.312	USFS
WNF-092	Quartz_North_WT	44.1866/-122.312	USFS
WNF-093	QuartzSouth_WT	44.0419/-122.315	USFS
WNF-097	Ridge_WT	44.0561/-122.221	USFS
WNF-109	Simmonds_WT	44.1694/-122.339	USFS
WNF-127	Walker_WT	44.1027/-122.219	USFS
WNF-146	MillForestBoundary_WT	44.19/-122.224	USFS
WNF-147	MillHwy126_WT	44.17/-122.243	USFS
10674-ORDEQ and PWB_SR_US_BR	Sandy River		USGS
14128910	Columbia River At Warrendale, OR	45.6123/-122.028	USGS
14150000	Middle Fork Willamette River Near Dexter, OR	43.9457/-122.837	USGS
14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	43.9443/-122.775	USGS
14152000	Middle Fork Willamette River At Jasper, OR	43.9982/-122.906	USGS
14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	43.7207/-123.05	USGS
14155500	Row River Near Cottage Grove, OR	43.7929/-122.991	USGS
14157500	Coast Fork Willamette River Near Goshen, OR	43.9804/-122.966	USGS
14158100	Willamette River At Owosso Bridge At Eugene, OR	44.0917/-123.116	USGS
14159110	Mckenzie River Above South Fork, Near Rainbow, OR	44.1664/-122.257	USGS

Station ID	Station	Latitude/Longitude	Organization
14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	44.0471/-122.218	USGS
14159500	South Fork Mckenzie River Near Rainbow, OR	44.136/-122.248	USGS
14159800	Mckenzie River Above Blue River, OR	44.1529/-122.332	USGS
14162200	Blue River At Blue River, OR	44.1623/-122.333	USGS
14162400	Mckenzie River At Finn Rock, OR	44.1282/-122.38	USGS
14162500	Mckenzie River Near Vida, OR	44.1248/-122.471	USGS
14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	44.1237/-122.628	USGS
14163900	Mckenzie River Near Walterville, OR	44.0698/-122.771	USGS
14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR	44.0707/-122.885	USGS
14164700	Cedar Creek At Springfield, OR	44.0593/-122.92	USGS
14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	44.0712/-122.965	USGS
14165500	Mckenzie River Near Coburg, OR	44.1131/-123.047	USGS
14166000	Willamette River At Harrisburg, OR	44.2704/-123.174	USGS
14169000	Long Tom River Near Alvadore, OR	44.1235/-123.3	USGS
14170000	Long Tom River At Monroe, OR	44.3129/-123.296	USGS
14173500	Calapooia River At Albany, OR	44.6207/-123.129	USGS
14174000	Willamette River At Albany, OR	44.6387/-123.107	USGS
14181500	North Santiam River At Niagara, OR	44.7538/-122.297	USGS
14181750	Rock Creek Near Mill City, OR	44.7121/-122.428	USGS

Station ID	Station	Latitude/Longitude	Organization
14182400	Little N Santiam R Blw Canyon Ck, Near Mehama, OR	44.7935/-122.493	USGS
14182500	Little North Santiam River Near Mehama, OR	44.7915/-122.579	USGS
14183000	North Santiam River At Mehama, OR	44.789/-122.619	USGS
14183010	North Santiam River Near Mehama, OR	44.7881/-122.636	USGS
14183020	North Santiam River Blw Stout Creek, Nr Mehama, OR	44.7782/-122.678	USGS
14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	44.7079/-122.973	USGS
14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	44.4482/-122.55	USGS
14187200	South Santiam River Near Foster, OR	44.4123/-122.689	USGS
14187500	South Santiam River At Waterloo, OR	44.4985/-122.823	USGS
14189050	Santiam River Near Jefferson, OR	44.7387/-123.05	USGS
14192015	Willamette River At Keizer, OR	44.9737/-123.037	USGS
14197900	Willamette River At Newberg, OR	45.2846/-122.961	USGS
14202000	Pudding River At Aurora, OR	45.2332/-122.75	USGS
14207200	Tualatin River At Oswego Dam, Near West Linn, OR	45.3565/-122.685	USGS
14207740	Willamette River Above Falls, At Oregon City, OR	45.3485/-122.62	USGS
14210000	Clackamas River At Estacada, OR	45.2998/-122.354	USGS
14211010	Clackamas River Near Oregon City, OR	45.3793/-122.577	USGS
14211500	Johnson Creek At Sycamore, OR	45.4775/-122.508	USGS
14211542	Crystal Springs Creek At Bybee St, Portland, OR	45.474/-122.642	USGS

Station ID	Station	Latitude/Longitude	Organization
14211546	Crystal Springs Creek At Mouth At Portland, OR	45.4607/-122.643	USGS
14211550	Johnson Creek At Milwaukie, OR	45.4529/-122.643	USGS
14211720	Willamette River At Portland, OR	45.5175/-122.669	USGS
14246900	Columbia River At Port Westward, Near Quincy, OR	46.1812/-123.183	USGS
444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	44.791/-122.751	USGS
453439122223900	Columbia River Right Bank at Washougal, WA		USGS
453630122021400	Columbia River, Left Bank, Near Dodson, OR	45.6082/-122.038	USGS
461518123285700	Unnamed Slough, Welch Island, Columbia River, OR	46.2551/-123.482	USGS
WDOE 26B070	Cowlitz River at Kelso		USGS & Washington Ecology
WDOE 27D090	Lewis River		USGS & Washington Ecology
WDOE 27B070	Kalama River		Washington Ecology

Table 51: Summary of existing temperature data in the Willamette River mainstem and major tributaries QAPP project area. Columns Jan – Dec indicate the number of daily maximum temperature results in each month. Data from the DEQ files that are not in the databases were not summarized in the table.

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	14128910	Columbia River At Warrendale, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	24	29	31	30	31	30	31
1990	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	17
1990	14173500	Calapooia River At Albany, OR	31	28	31	30	31	30	31	31	30			
1990	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14128910	Columbia River At Warrendale, OR	31	28	31	30	31	30			26	31	27	16
1991	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	26	31	30	31	31	30	31	30	31
1991	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14162200	Blue River At Blue River, OR			31	30	31	30	31	31	30	31	1	15
1991	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	26		23	30	31	30	31
1991	14207200	Tualatin River At Oswego Dam, Near West Linn, OR					24	30	31	31	30	31	30	31
1992	14128910	Columbia River At Warrendale, OR	31	29	31	30	31	30	31	31	30			
1992	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	27	30	29
1992	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1992	14159500	South Fork Mckenzie River Near Rainbow, OR	12		23	15	5	30	31	31	30	29	30	31
1992	14159800	Mckenzie River Above Blue River, OR						12	31	31	30	31	30	31
1992	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	29	31	30	29
1992	14162400	Mckenzie River At Finn Rock, OR						5	31	31	30	31	30	31
1992	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR						20	31	31	30	31	27	30
1992	14163900	Mckenzie River Near Walterville, OR					10	30	31	31	30	31	30	31
1992	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
1993	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	29	29			22	31	29	31	30	31
1993	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14159800	Mckenzie River Above Blue River, OR	31	28	31	30	31	30	31	31	30			
1993	14162200	Blue River At Blue River, OR	31	28	15	10	31	30	31	31	30	31	30	31
1993	14162400	Mckenzie River At Finn Rock, OR	31	28	31	30	31	30	31	31	30			
1993	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30			
1993	14163900	Mckenzie River Near Walterville, OR	25	28	31	30	25	28	31	31	30			
1993	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14202000	Pudding River At Aurora, OR								25	30	31	30	31
1993	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	31	23	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1994	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	27
1994	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	6
1994	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14181500	North Santiam River At Niagara, OR	31	28	23		5	30	31	31	30	31	30	31
1994	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	18			22	30
1994	14202000	Pudding River At Aurora, OR	31	28	31	30	18	30	31	31	30	31	30	31
1994	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	9	30	31	20	31
1994	14246900	Columbia River At Port Westward, Near Quincy, OR		25	31	30	31	30	27		9	31	26	23
1995	14150000	Middle Fork Willamette River Near Dexter, OR	5	27	30	30	31	29	31	31	30	31	23	19
1995	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14159500	South Fork Mckenzie River Near Rainbow, OR		6	31	30	31	30	31	31	30	31	30	31
1995	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14187200	South Santiam River Near Foster, OR	31	28	31	30	30	30	31	31	30	31	30	31
1995	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	29	4	30	30	31	31	30	31	30	31
1995	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	28	
1996	14150000	Middle Fork Willamette River Near Dexter, OR					18	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14162200	Blue River At Blue River, OR	15	29	31	30	31	30	31	31	30	31	30	31
1996	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	6		11
1996	14187200	South Santiam River Near Foster, OR	31	16			31	30	31	31	30	15	23	31
1996	14202000	Pudding River At Aurora, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	6			23	30	31	31	30	31	30	30
1996	14246900	Columbia River At Port Westward, Near Quincy, OR	21	29	31	30	31	30	31	31	30	31	30	30
1996	453630122021400	Columbia River, Left Bank, Near Dodson, OR			19	29	31	30	31	23	12			8
1997	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	30	23	31	30	31	31	30			
1997	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	14	22	31	30	31	30	31	31	30			
1997	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	15
1997	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14181500	North Santiam River At Niagara, OR	31	28	31	29	31	30	31	31	30			
1997	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	29			
1997	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30			
1997	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	10	28	31	30	31	30	31	31	30	31	30	31
1997	14246900	Columbia River At Port Westward, Near Quincy, OR	28	28	31	30	31	30	31	28			18	31
1997	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	27	29	29	31	29	31	5		12	28	25

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	14159500	South Fork Mckenzie River Near Rainbow, OR	5	4	31	30	31	30	31	31	30	31	30	31
1998	14162200	Blue River At Blue River, OR	31	28	2	2	31	30	31	31	30	31	30	31
1998	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	29	22	31	30	31	30	31	31	30	31	30	31
1998	14211500	Johnson Creek At Sycamore, OR				3	31	30	31	29	30	31	28	28
1998	14211542	Crystal Springs Creek At Bybee St, Portland, OR							14	29	30	31	30	31
1998	14211546	Crystal Springs Creek At Mouth At Portland, OR							12	31	30	31	30	31
1998	14211550	Johnson Creek At Milwaukie, OR					25	30	31	31	30	31	27	31
1998	14246900	Columbia River At Port Westward, Near Quincy, OR	29	28	31	30	31	30	31	31	30	31	30	31
1998	33643-ORDEQ	Goble Creek upstream of South Fork Goble Creek (Columbia)								13	30	10		
1998	453630122021400	Columbia River, Left Bank, Near Dodson, OR	30	28	29	27	31	29	31	31	29	31	29	23
1998	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					31	30	31	31	30	27		
1999	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	29	
1999	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	19		
1999	14181500	North Santiam River At Niagara, OR										31	30	31
1999	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	25	31	30	23	31	30	31	30	31
1999	14211500	Johnson Creek At Sycamore, OR	31	25	31	30	31	30	31	31	30	31	30	31
1999	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	25809-ORDEQ	Lost Creek downstream of Guiley Creek						17	31	31	30	31	8	
1999	25811-ORDEQ	Lost Creek at River Mile 11.7						17	31	31	30	31	8	
1999	26626-ORDEQ	Lost Creek downstream of Wagner Creek (Willamette, Middle Fork Willamette)						16	31	31	30	13		
1999	26627-ORDEQ	Lost Creek at mouth, Elijah Bristow Stata Park (Willamette, Middle Fork Willamette)						16	31	23				
1999	26628-ORDEQ	Lost Creek at Elijah Bristow State Park, pond at property line (Willamette, Middle Fork,Willamette)							31	31	30	31	10	
1999	26629-ORDEQ	Lost Creek at Lost Creek Road (Willamette, Middle Fork, Willamette)						18	31	31	30	31	13	
1999	33744-ORDEQ	Lost Creek at headwaters, Mount June, 10.9 miles from Bear Boulevard (Willamette)						17	31	31	30	31	8	
1999	453630122021400	Columbia River, Left Bank, Near Dodson, OR	6	22	30	29	31	30	29	30	30	29	26	31
1999	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				4	31	1	19	31	30	31	4	
2000	10365-ORDEQ	Santiam River at I-5 Freeway						16		7	30	14		
2000	10792-ORDEQ	North Santiam River at Greens Bridge						23	24	7	30	7		
2000	11137-ORDEQ	Ferguson Creek at Territorial Road							31	31	30	2		
2000	11138-ORDEQ	Bear Creek at Territorial Hwy (Junction City)						3	28	31	30	2		
2000	14152000	Middle Fork Willamette River At Jasper, OR										26	30	31
2000	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR												30

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	14159500	South Fork Mckenzie River Near Rainbow, OR												12
2000	14162500	Mckenzie River Near Vida, OR											29	31
2000	14166000	Willamette River At Harrisburg, OR										27	30	31
2000	14181500	North Santiam River At Niagara, OR	31	29	31	29	31	30	31	31	30	31	30	31
2000	14182500	Little North Santiam River Near Mehama, OR				25	31	29	31	31	30	31	30	31
2000	14183000	North Santiam River At Mehama, OR				25	31	30	31	31	30	31	30	31
2000	14192015	Willamette River At Keizer, OR										6	30	31
2000	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	29	28	30	31	30	31	31	30	31	30	31
2000	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	29	31	30	31	30	31	31	30			
2000	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	29	30	31	30	29	31	30	31	30	31
2000	23859-ORDEQ	Ferguson Creek at River Mile 8.4, at Ferguson Road (Long Tom, Willamette)							31	31	30	2		
2000	24338-ORDEQ	North Santiam River at River Drive, irrigation access ramp in Norpac field						6	29	31	14			
2000	24339-ORDEQ	Santiam River upstream of Jefferson Treatment Plant						16	31	31	30	10		
2000	24571-ORDEQ	Chehulpum Creek downstream of Talbot Slough, 50 yards upstream of RR bridge (Santiam)						28	31	31	30	31	15	
2000	24572-ORDEQ	Chehulpum Creek at Interstate 5, Talbot Road, exit (Santiam)						28	31	31	28			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	24574-ORDEQ	Marion Creek at Jefferson-Marion Road Bridge, next to Pletzer Road (Santiam)						23	31	31	30	11		
2000	25270-ORDEQ	Amazon Creek, tributary to Long Tom River, at High Pass Road							31	31	30	2		
2000	25271-ORDEQ	Long Tom River below Fern Ridge Spillway							28	31	30	31	18	
2000	25370-ORDEQ	Long Tom River just below bridge at Franklin Road								21	30	31	18	
2000	25373-ORDEQ	Long Tom River at Bundy Bridge near mouth							31	31	30	31	18	
2000	25533-ORDEQ	Clackamas River at the Carver Bridge					9	30	27		8	31	30	31
2000	25773-ORDEQ	Coyote Creek at mouth near Franklin Road								21	30	31	18	
2000	25808-ORDEQ	Lost Creek near 38404 Dexter Road, Dexter (River Mile 1.6), Middle Fork Willamette							24	31	30	31	30	8
2000	25809-ORDEQ	Lost Creek downstream of Guiley Creek							18	31	30	31	30	8
2000	25811-ORDEQ	Lost Creek at River Mile 11.7							18	31	30	31	30	28
2000	25817-ORDEQ	Santiam River 0.75 miles downstream of confluence						24	31	16	19	14		
2000	25975-ORDEQ	Stout Creek at mouth (North Santiam, Willamette)						15	31	31	14			
2000	25976-ORDEQ	North Santiam River just upstream of Stout Creek (Willamette)						15	31	31	14			
2000	25977-ORDEQ	North Santiam River downstream of Stout Creek (Willamette)						15	31	15	14			
2000	25978-ORDEQ	North Santiam River just upstream of Bear Branch (Willamette)								8	14			
2000	25980-ORDEQ	North Santiam River upstream of Marion Creek (Willamette)						19	31	31	14			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	25981-ORDEQ	Bear Branch at Shelburn Drive (North Santiam, Willamette)						22	31	31	14			
2000	25984-ORDEQ	Santiam River upstream of Chehulpum Creek (Talbot Slough) (Willamette)						28	31	31	30	31	15	
2000	25985-ORDEQ	North Santiam River approximately 1 mile downstream of Bear Branch (Willamette)						19	31	31	14			
2000	25986-ORDEQ	North Santiam River at approximately River Mile 20.5, Miller's Farm (Willamette)						11	31	31	14			
2000	26624-ORDEQ	Lost Creek at River Mile 7.8 (Willamette, Middle Fork Willamette)							18	31	30	31	30	28
2000	26626-ORDEQ	Lost Creek downstream of Wagner Creek (Willamette, Middle Fork Willamette)							24	31	30	31	19	
2000	26627-ORDEQ	Lost Creek at mouth, Elijah Bristow Stata Park (Willamette, Middle Fork Willamette)						12	31	31	30	31	30	28
2000	26628-ORDEQ	Lost Creek at Elijah Bristow State Park, pond at property line (Willamette, Middle Fork,Willamette)							5	31	30	31	30	8
2000	26629-ORDEQ	Lost Creek at Lost Creek Road (Willamette, Middle Fork, Willamette)							24	31	30	31	19	
2000	28089-ORDEQ	Anthony Creek						2	31	15				
2000	28091-ORDEQ	Guiley Creek						2	31	8				
2000	28093-ORDEQ	Lost Creek						2	31	7				
2000	28094-ORDEQ	Middle Creek						2	31	8				
2000	28110-ORDEQ	Cedar Creek - tributary							16	31	5			
2000	28111-ORDEQ	Camp Creek							16	31	6			
2000	28114-ORDEQ	Deer Creek							19	16				

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	28115-ORDEQ	Finn Creek							16	31	5			
2000	28278-ORDEQ	Lost Creek at River Mile 9.4 (Willamette, Middle Fork Willamette)								28	30	31	30	28
2000	28468-ORDEQ	Springbrook Creek upstream of Wilsonville Road							10	31	30	4		
2000	28477-ORDEQ	Hawn Creek (tributary to Yamhill River)							12	8				
2000	28485-ORDEQ	Chehalem Creek upstream of Dopp Road							12	31	11			
2000	28486-ORDEQ	Chehalem Creek upstream of Ewing Young Park							10	31	30	4		
2000	28901-ORDEQ	Hess Creek upstream of Fulton Street (Yamhill, Willamette)							10	31	28	4		
2000	30437-ORDEQ	Clear Creek at mouth (tributary to Clackamas River at River Mile 8.2)					9	30	31	31	30	31	30	31
2000	30438-ORDEQ	Deep Creek at mouth (tributary to Clackamas River at River Mile 12.2)						2	31	31	21			
2000	30439-ORDEQ	Clackamas River upstream of Eagle Creek					9	30	31	31	30	31	30	31
2000	30440-ORDEQ	Eagle Creek at mouth (tributary to Clackamas River at River Mile 16.7)					9	30	31	31	30	31	30	31
2000	30442-ORDEQ	Estacada Lake near spillway (PGE site)					8	30	25		9	31	7	
2000	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	29	31	29	29	30	30	31	30	31	30	31
2000	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)						9	31	31	30	31	6	
2001	10340-ORDEQ	Willamette River at I-5 (Wilsonville)						18	31	31	30	31	4	
2001	10344-ORDEQ	Willamette River at Wheatland Ferry					16	29	31	31	30	22		
2001	10347-ORDEQ	Willamette River at South River Road (Independence)						17	31	31	30	31	7	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	10349-ORDEQ	Willamette River at Conser Road (Albany)						17	31	31	30	31	6	
2001	10359-ORDEQ	Willamette River at Hwy 126 (Springfield)					1	30	31	31	30	31	1	
2001	10363-ORDEQ	Yamhill River at Dayton						29	31	31	30	31	4	
2001	10366-ORDEQ	South Santiam River Hwy 226 (Crabtree)									9	31	7	
2001	10380-ORDEQ	Coast Fork Willamette River at Creswell					2	30	31	31	30	31	5	
2001	10381-ORDEQ	Coast Fork Willamette River at Saginaw Bridge					2	30	31	31	30	31	5	
2001	10784-ORDEQ	Crabtree Creek at Riverside School Road						30	31	31	30	31	2	
2001	10792-ORDEQ	North Santiam River at Greens Bridge								29	30	31	6	
2001	10917-ORDEQ	Pudding River at Hwy 99E (Aurora)						19	31	31	30	31	4	
2001	11102-ORDEQ	Rickreall Creek at State Farm Road					16	29	31	31	30	22		
2001	11201-ORDEQ	Columbia Slough at Landfill Road						9	31	20	22	31		
2001	13046-ORDEQ	Clackamas River at Barton Park Bridge				11	31	29	31	31	5			
2001	14150000	Middle Fork Willamette River Near Dexter, OR								31	30	31	30	31
2001	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR								30	30	31	30	31
2001	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	29	30	31	31	30	31	20	
2001	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR								29	30	31	24	24
2001	14155500	Row River Near Cottage Grove, OR								31	30	31	30	31
2001	14157500	Coast Fork Willamette River Near Goshen, OR								16	30	31	30	31
2001	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	27	31	30	31	30	31	29	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	14159500	South Fork Mckenzie River Near Rainbow, OR	29	28	31	30	31	27	31	31	30	24	26	31
2001	14162200	Blue River At Blue River, OR								23	30	31	30	31
2001	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14163900	Mckenzie River Near Walterville, OR								24	30	31	30	31
2001	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	26	31	31	30	31	30	31
2001	14169000	Long Tom River Near Alvadore, OR								24	30	31	11	27
2001	14170000	Long Tom River At Monroe, OR								24	30	31	30	31
2001	14174000	Willamette River At Albany, OR								22	30	31	30	31
2001	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14182500	Little North Santiam River Near Mehama, OR	31	27	31	30	31	30	31	31	30	31	30	31
2001	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14187200	South Santiam River Near Foster, OR								8	30	31	30	31
2001	14187500	South Santiam River At Waterloo, OR								7	30	31	30	28
2001	14189050	Santiam River Near Jefferson, OR					7	30	31	31	30	31	30	31
2001	14192015	Willamette River At Keizer, OR	31	28	31	30	31	11		28	30	31	30	31
2001	14197900	Willamette River At Newberg, OR										13	14	
2001	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	29
2001	14207740	Willamette River Above Falls, At Oregon City, OR								23	30	31	30	31
2001	14210000	Clackamas River At Estacada, OR							20	31	30	31	30	31
2001	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14211720	Willamette River At Portland, OR											18	31
2001	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	24339-ORDEQ	Santiam River upstream of Jefferson Treatment Plant							25	31	30	9		
2001	24571-ORDEQ	Chehulpum Creek downstream of Talbot Slough, 50 yards upstream of RR bridge (Santiam)							25	31	30	2		
2001	24572-ORDEQ	Chehulpum Creek at Interstate 5, Talbot Road, exit (Santiam)							25	31	30	9		
2001	25381-ORDEQ	Chehalem Creek tributary						5	16					
2001	25533-ORDEQ	Clackamas River at the Carver Bridge	31	28	31	30	31	29	9	21	30	25		
2001	25809-ORDEQ	Lost Creek downstream of Guiley Creek						7	31	31	30	25		
2001	25817-ORDEQ	Santiam River 0.75 miles downstream of confluence							25	31	30	9		
2001	25975-ORDEQ	Stout Creek at mouth (North Santiam, Willamette)							31	31	27			
2001	25976-ORDEQ	North Santiam River just upstream of Stout Creek (Willamette)							31	31	27			
2001	25977-ORDEQ	North Santiam River downstream of Stout Creek (Willamette)							31	31	10			
2001	25978-ORDEQ	North Santiam River just upstream of Bear Branch (Willamette)							31	31	25			
2001	25980-ORDEQ	North Santiam River upstream of Marion Creek (Willamette)							31	31	25			
2001	25981-ORDEQ	Bear Branch at Shelburn Drive (North Santiam, Willamette)							31	31	30	10		
2001	25984-ORDEQ	Santiam River upstream of Chehulpum Creek (Talbot Slough) (Willamette)							25	31	30	2		
2001	25985-ORDEQ	North Santiam River approximately 1 mile downstream of Bear Branch (Willamette)							31	31	25			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	25987-ORDEQ	North Santiam River near N. Santiam State Park, 46559 Tuckwila Street (Willamette)							31	31	28			
2001	26624-ORDEQ	Lost Creek at River Mile 7.8 (Willamette, Middle Fork Willamette)						7	31	31	30	25		
2001	26625-ORDEQ	Lost Creek at headwaters, 5.5 meters up Bear Boulevard (Willamette, Middle Fork Willamette)						10	31	31	30	25		
2001	26627-ORDEQ	Lost Creek at mouth, Elijah Bristow Stata Park (Willamette, Middle Fork Willamette)	5											
2001	26628-ORDEQ	Lost Creek at Elijah Bristow State Park, pond at property line (Willamette, Middle Fork,Willamette)						7	31	31	30	23		
2001	26745-ORDEQ	Willamette River at Roehr Waterfront Park						9	31	20	22	31		
2001	26747-ORDEQ	Columbia River downstream of Multnomah Channel									6	28		
2001	26749-ORDEQ	Long Tom River near River Mile 19.8					1	30	31	31	30	31	5	
2001	26750-ORDEQ	Long Tom River near River Mile 12.3						30	31	31	30	31	5	
2001	26751-ORDEQ	North Santiam River at River Mile 47.6 - Detroit Lake Tailrace						23	28	4	25	31	2	
2001	26752-ORDEQ	Columbia River at River Mile 122.5						18	31	31	30	31		
2001	26753-ORDEQ	Willamette River near River Mile 147						26	31	31	30	31	6	
2001	26754-ORDEQ	Columbia River near River Mile 66.8							14		23	31	14	
2001	26755-ORDEQ	Willamette River above Long Tom River						26	31	31	30	31	6	
2001	26756-ORDEQ	Santiam River near mouth						17	31	31	30	31	6	
2001	26757-ORDEQ	McKenzie River at Bellinger Landing							25	31	30	14		
2001	26758-ORDEQ	McKenzie River at River Mile 26.6 - Deerhorn							21	31	30	14		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	26759-ORDEQ	Mill Creek at River Mile 2.2 at State Street, Salem						23	31	31	30	31	5	
2001	26760-ORDEQ	Multnomah Channel downstream of Gilbert River									6	31		
2001	26761-ORDEQ	North Santiam River near River Mile 31.3						23	31	31	30	31	2	
2001	26770-ORDEQ	McKenzie River at River Mile 49.0, below Couger River					2	30	31	31	30	14		
2001	26772-ORDEQ	Willamette River at River Mile 141.7						26	31	31	30	31	6	
2001	26773-ORDEQ	Tualatin River at West Linn near SW Borland Road						19	31	31	30	31	4	
2001	26774-ORDEQ	South Santiam River at River Mile 0.5						17	31	31	30	31	7	
2001	28108-ORDEQ	Bear Creek						25	31	31	12			
2001	28111-ORDEQ	Camp Creek						25	31	31	12			
2001	28114-ORDEQ	Deer Creek						25	31	31	12			
2001	28115-ORDEQ	Finn Creek						25	31	31	12			
2001	28254-ORDEQ	Willamette River upstream of Rickreall Creek					16	29	31	31	30	22		
2001	28255-ORDEQ	Willamette River upstream of WLTP outfall							20	31	24			
2001	28256-ORDEQ	North Santiam River at Geren Station (Stayton Island), Salem Water Plant #2 intake					23	29	31	31	24			
2001	28278-ORDEQ	Lost Creek at River Mile 9.4 (Willamette, Middle Fork Willamette)	7					8	31	31	30	25		
2001	28504-ORDEQ	McKenzie River at Helfrich Boat Ramp, 1.8 miles upstream of Gate Creek						9	31	31	20			
2001	28505-ORDEQ	McKenzie River at Dearborn Island, upstream of South Fork McKenzie River						9	31	31	20			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	28506-ORDEQ	Willamette River at River Mile 18.8 - north fo Deer Island						8	31	31	30	31		
2001	28507-ORDEQ	Willamette River at River Mile 18.7 - upstream of Kellogg outfall						8	31	31	30	31		
2001	28508-ORDEQ	Willamette River at River Mile 18.5 - downstream of Kellogg outfall						8	31	31	30	31		
2001	28723-ORDEQ	Willamette River upstream of McKenzie River at River Mile 177						11	31	31	30	31	1	
2001	28724-ORDEQ	Middle Fork Willamette near mouth					20	29	31	31	30	31	1	
2001	28765-ORDEQ	Willamette River at St. John's RR Bridge, City of Portland site										20		
2001	30437-ORDEQ	Clear Creek at mouth (tributary to Clackamas River at River Mile 8.2)	31	28	31	30	31	29	31	31	30	25		
2001	30438-ORDEQ	Deep Creek at mouth (tributary to Clackamas River at River Mile 12.2)				11	31	29	31	31	30	25		
2001	30439-ORDEQ	Clackamas River upstream of Eagle Creek	31	28	31	30	31	29	31	31	30	25		
2001	30440-ORDEQ	Eagle Creek at mouth (tributary to Clackamas River at River Mile 16.7)	31	28	31	30	31	29	31	31	30	25		
2001	30441-ORDEQ	Clackamas River at lower Milo McIver Park boat launch				11	31	29	31	31	30	25		
2001	30442-ORDEQ	Estacada Lake near spillway (PGE site)	31	28	31	30	31	29	31	31	30	26		
2001	33744-ORDEQ	Lost Creek at headwaters, Mount June, 10.9 miles from Bear Boulevard (Willamette)						10	31	31	30	25		
2001	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR			10	30	31	30	31	31	30	31	30	31
2001	453630122021400	Columbia River, Left Bank, Near Dodson, OR	29	28	31	28	29	30	31	31	29	31	30	30
2001	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					25	4	30	6		31	5	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	10658-ORDEQ	Luckiamute River at Lower Bridge						17	17					
2002	10856-ORDEQ	Johnson Creek at SE 122nd Avenue (Portland)					2	30	29					
2002	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14152000	Middle Fork Willamette River At Jasper, OR		22	31	30	31	30	31	31	30	31	30	24
2002	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	27	26	28
2002	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14159500	South Fork Mckenzie River Near Rainbow, OR	31	26	29	30	31	30	31	31	29	31	28	31
2002	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	30	31	30	31	27	31
2002	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	27	31	31	30	31	30	31
2002	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	29	
2002	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14197900	Willamette River At Newberg, OR	16	28	31	27	31	30	30	30	30	31	30	27
2002	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	27	30	31	31	30	31	30	31
2002	14207740	Willamette River Above Falls, At Oregon City, OR	31	28	31	30	31	30	24	31	30	27	17	9
2002	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211010	Clackamas River Near Oregon City, OR						10	31	31	30	31	30	31
2002	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211546	Crystal Springs Creek At Mouth At Portland, OR												26
2002	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	29	31	31	30	31	30	31
2002	28088-ORDEQ	Hills Creek							29	31	2			
2002	28089-ORDEQ	Anthony Creek						4	31	31	2			
2002	28091-ORDEQ	Guiley Creek						4	31	31	2			
2002	28092-ORDEQ	Little Falls Creek 2						4	31	31	2			
2002	28094-ORDEQ	Middle Creek						4	31	31	2			
2002	28108-ORDEQ	Bear Creek						11	31	31	3			
2002	28111-ORDEQ	Camp Creek							28	31	3			
2002	28114-ORDEQ	Deer Creek						11	31	31	3			
2002	28115-ORDEQ	Finn Creek							28	31	3			
2002	28468-ORDEQ	Springbrook Creek upstream of Wilsonville Road						4	31	31	30	22		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	28504-ORDEQ	McKenzie River at Helfrich Boat Ramp, 1.8 miles upstream of Gate Creek				9	31	30	31	31	8			
2002	28505-ORDEQ	McKenzie River at Dearborn Island, upstream of South Fork McKenzie River				9	31	30	31	31	8			
2002	28616-ORDEQ	Middle Santiam River below Green Peter Reservoir at Old Fish Facility				5	31	30	31	5				
2002	28818-ORDEQ	Blue Lake (Multnomah Co) Fishing Dock						25	31	31	30	30		
2002	28901-ORDEQ	Hess Creek upstream of Fulton Street (Yamhill, Willamette)							15	31	30	22		
2002	29642-ORDEQ	North Santiam River at River Mile 12.2						19	21					
2002	29746-ORDEQ	Willamette River upstream of Oregon Steel Mills - City of Portland site					17	15						
2002	30501-ORDEQ	Middle Fork Willamette River just below Lookout Point Dam				9	31	30	31	31	8			
2002	30532-ORDEQ	Gosage Creek (tributary to Goodman, to MFW 26.2)						4	31	31	2			
2002	30533-ORDEQ	Little Fall Creek at River Mile 7.6						4	31	31	2			
2002	30534-ORDEQ	Lost Creek at River Mile 9.3 (tributary to MFW 13.5)						4	31	31	2			
2002	31022-ORDEQ	Rainer Fire Station							11	31	30	22		
2002	31075-ORDEQ	Portland Cully Helensview						9	31	31	26			
2002	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	6	28	31	30	31	30	31	31	30	31	30	31
2002	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	29	28	30	29	31	31	30	31	30	31
2002	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					26	30	31	31	9	31	4	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14152000	Middle Fork Willamette River At Jasper, OR	9	15	24	27	31	30	31	31	30	31	30	2
2003	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	24	10	31	30	31	30	31	31	30	31	30	22
2003	14155500	Row River Near Cottage Grove, OR	31	28	31	30	28	30	31	31	30	31	30	31
2003	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30			
2003	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	2	28	24	30	31	30	31	31	30	31	30	31
2003	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	25
2003	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	27	30	31	30	31	27	30	31	30	31
2003	14162200	Blue River At Blue River, OR	27	26	31	30	31	30	31	31	30	31	30	31
2003	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	29	30	31
2003	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	9						24
2003	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30			
2003	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	27	18	31	28	27	30	31
2003	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30			
2003	14189050	Santiam River Near Jefferson, OR	22	17	28	27	16	24	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14197900	Willamette River At Newberg, OR	19	24	27	27	31	26	31	31	30	31	30	31
2003	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14207740	Willamette River Above Falls, At Oregon City, OR	8			26	29	30	31	31	30			
2003	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211010	Clackamas River Near Oregon City, OR	31	28	31	23	31	30	31	31	30	31	30	31
2003	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211720	Willamette River At Portland, OR	31	28	31	29	31	29	29	31	30	31	30	31
2003	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30			
2003	23807-ORDEQ	Columbia River Mid-Channel at Marker 28				14	31	30	31	31	30	31	30	
2003	28468-ORDEQ	Springbrook Creek upstream of Wilsonville Road							31	31	30	5		
2003	28486-ORDEQ	Chehalem Creek upstream of Ewing Young Park							31	31	30	23		
2003	30334-ORDEQ	South Fork Goble Creek					2	30	2					
2003	30628-ORDEQ	Tanner Creek								29				
2003	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	29	28	31	30	31	30	31	31	30	31	30	27
2003	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	28	30	31	30	31	29	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					27	30	31	31	30	31	3	
2004	10362-ORDEQ	Pudding River at Arndt Road (Barlow)										10	12	
2004	10636-ORDEQ	Molalla River at mouth									14	7		
2004	10637-ORDEQ	Molalla River at Knights Bridge Road (Canby)												17
2004	10881-ORDEQ	Molalla River at Hwy 213 Bridge (Mulino)							8	31	30	6		12
2004	10917-ORDEQ	Pudding River at Hwy 99E (Aurora)											17	4
2004	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	29	31	31	30	31	30	31
2004	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14152000	Middle Fork Willamette River At Jasper, OR			1	30	31	30	31	31	30	31	30	31
2004	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	26	29	31	19	26	30	31	31	30	31	30	31
2004	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	28	31	31	30	31	30	31
2004	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	31	24	22	30	31	25	24	31	30	31	30	31
2004	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	27	31	30	31	30	31
2004	14162500	Mckenzie River Near Vida, OR	31	29	31	29	31	30	23	31	30	31	30	31
2004	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	28	31	30	31
2004	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14169000	Long Tom River Near Alvadore, OR	29	2		8	31	30	31	31	30	31	30	31
2004	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	30	27	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	14181500	North Santiam River At Niagara, OR	31	29	31	25	31	30	31	31	30	31	30	31
2004	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	29	31	30	31
2004	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	30	31	30	31	29	30
2004	14189050	Santiam River Near Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14192015	Willamette River At Keizer, OR	31	29	31	30	31	30	31	31	30	22		29
2004	14197900	Willamette River At Newberg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	29
2004	14210000	Clackamas River At Estacada, OR	31	29	27	28	31	30	31	31	30	28	30	31
2004	14211010	Clackamas River Near Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	25271-ORDEQ	Long Tom River below Fern Ridge Spillway					6	30	31	31	30	31	30	31
2004	28573-ORDEQ	Long Tom River at Hwy 36					6	30	31	31	30	31	30	31
2004	30628-ORDEQ	Tanner Creek						23	31	31	20			
2004	31377-ORDEQ	Big Creek						8	31	31	26			
2004	31382-ORDEQ	Tryon Creek						8	31	31	26			
2004	31390-ORDEQ	Tide Creek							25	31	22			
2004	31403-ORDEQ	Abernethy Creek						20	31	31	30	10		
2004	31405-ORDEQ	Milton Creek upper							25	31	22			
2004	31876-ORDEQ	Mill Creek Ehlen Road											21	1

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	32058-ORDEQ	Molalla River at Canby-Marquam Hwy (Goods Bridge)												17
2004	32059-ORDEQ	Molalla River at 22nd Avenue									7			8
2004	32060-ORDEQ	Mill Creek upstream of Hubbard STP (Pudding River)									8		22	2
2004	32061-ORDEQ	Molalla River upstream of Milk Creek									15			
2004	32062-ORDEQ	Molalla River North of Oak Grove Road									17			
2004	32645-ORDEQ	Davidson Creek at River Mile 0.05 (Ferguson Creek, Long Tom River, Upper Willamette)								25				
2004	32649-ORDEQ	Owens Creek at High Pass Rd near Templeton Rd, RM 4.23 (Bear Crk, Long Tom R, Upper Willamette)								25	30	21		
2004	32651-ORDEQ	Owens Creek at RM 3.96 off High Pass Rd ~ 0.3 miles D/S Lavell Rd (Bear Crk to Long Tom R)								26	30	21		
2004	32653-ORDEQ	Turnbow Creek at High Pass Road, RM 0.88 (Owens Creek, Bear Creek, Long Tom R., Upper Willamette)							29	31	30	21		
2004	32655-ORDEQ	Owens Creek at RM 3.86 off High Pass Rd, ~ 0.4 miles D/S Lavell Rd (Bear Crk to Long Tom R)								26	30	21		
2004	32656-ORDEQ	Ferguson Creek at River Mile 7.7 (Long Tom River, Upper Willamette)								25	30	21		
2004	32657-ORDEQ	Bear Creek at River Mile 0.69 (Ferguson Creek, Long Tom River, Upper Willamette)							29	31	30	21		
2004	32659-ORDEQ	Bear Creek at River Mile 0.57 (Ferguson Creek, Long Tom River, Upper Willamette)							29	31	30	21		
2004	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	21	8	31	29	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	29	31	30	31	29	31	29	30	31	30	31
2004	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					22	30	31	31	30	31	1	
2004	WNF-021	Cone_WT						27	31	31	19			
2004	WNF-056	Indian_WT					12	30	31	31	22			
2004	WNF-093	QuartzSouth_WT						17	31	31	22			
2004	WNF-146	MillForestBoundary_WT						26	31	31	20			
2004	WNF-147	MillHwy126_WT						26	31	31	20			
2005	10886-ORDEQ	Mill Creek at Ehuen Road Bridge (Aurora)						13	31	31	26			
2005	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14152000	Middle Fork Willamette River At Jasper, OR	31	28	29	30	31	30	31	31	30	31	9	
2005	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	18
2005	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	30	30	30	31	30	31
2005	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14163900	Mckenzie River Near Walterville, OR	31	28	31	27	31	29	31	31	30	31	14	
2005	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14169000	Long Tom River Near Alvadore, OR	31	28	3			7	31	31	30	31	28	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14181750	Rock Creek Near Mill City, OR										31	30	31
2005	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14187200	South Santiam River Near Foster, OR	29	24	31	30	4					12	30	31
2005	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	25	22	21	31	30	31
2005	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	26	29	31	30	29	30	30	31	30	31
2005	14210000	Clackamas River At Estacada, OR	30	28	19	22	31	30	31	25	29	30	28	30
2005	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	29			
2005	25271-ORDEQ	Long Tom River below Fern Ridge Spillway	24											
2005	28573-ORDEQ	Long Tom River at Hwy 36	24											
2005	34202-ORDEQ	Multnomah Channel US Santosh Slough (Columbia)											29	31
2005	34209-ORDEQ	Scappoose Bay at Marker #3 (Multnomah, Columbia)											29	31
2005	35083-ORDEQ	Yamhill River at LaFayette Hwy.						14	31	30				

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	453630122021400	Columbia River, Left Bank, Near Dodson, OR	30	28	31	30	31	30	31	31	30	31	30	30
2005	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					30	30	31	31	30	31	7	
2005	WNF-021	Cone_WT					20	30	31	31	28			
2005	WNF-093	QuartzSouth_WT						21	31	31	30	2		
2005	WNF-146	MillForestBoundary_WT					14	30	31	31	30	3		
2005	WNF-147	MillHwy126_WT					14	30	31	31	30	3		
2006	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14152000	Middle Fork Willamette River At Jasper, OR		16	31	30	31	28	31	31	30	31	30	31
2006	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	4	28	31	30	31	30	31	31	30			
2006	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14169000	Long Tom River Near Alvadore, OR		6	31	30	31	30	31	31	30	31	29	31
2006	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	14181750	Rock Creek Near Mill City, OR	31	28	31	30	31	30	31	31	26	31	30	31
2006	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	29	28	29	31	31	30	31	30	30
2006	14210000	Clackamas River At Estacada, OR	6	28	31	30	31	30	31	31	30	31	30	15
2006	14211010	Clackamas River Near Oregon City, OR	31	25	28	30	31	30	31	31	30	31	30	31
2006	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	30	28	31
2006	28713-ORDEQ	Mill Creek at Turner Road (tributary to Willamette River at River Mile 84)											22	31
2006	28964-ORDEQ	Clark Creek at mouth (tributary to Pringle Creek at River Mile 1.05)										8	30	31
2006	33477-ORDEQ	Willamette River tributary at River Mile 0.3							19	31	30	1		
2006	33485-ORDEQ	Croisan Creek							26	31	30	3		
2006	33488-ORDEQ	Claggett Creek							25	8	16	3		
2006	33491-ORDEQ	McNulty Creek							21	4	19	1		
2006	33496-ORDEQ	Willamette tributary near Wilsonville							24	31	30	3		
2006	33506-ORDEQ	Periwinkle Creek							20	31	30	2		
2006	33512-ORDEQ	Clark Creek, Salem							25	31	30	3		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	33517-ORDEQ	Columbia Slough							20	31	30	2		
2006	33518-ORDEQ	Miller Creek							21	31	30	1		
2006	33519-ORDEQ	Jackson Creek							20	31	30	2		
2006	33521-ORDEQ	Dunawi Creek							21	31	30	2		
2006	33523-ORDEQ	Abernathy Creek							21	31	30	3		
2006	33524-ORDEQ	Columbia Slough							20	13				
2006	33832-ORDEQ	Willamette River							25	31	30	1		
2006	33833-ORDEQ	McKenzie River							24	31	30	2		
2006	33834-ORDEQ	North Santiam River								22	30	18		
2006	33840-ORDEQ	Row River at River Mile 2.5 near Cottage Grove							26	31	27			
2006	33854-ORDEQ	Willamette River at River Mile 115 near Millersburg								23	11			
2006	33855-ORDEQ	Tualatin River at River Mile 1.5 near West Linn							21	31	17			
2006	34202-ORDEQ	Multnomah Channel US Santosh Slough (Columbia)	31	28	31	30	31	30	31	31	30	18		
2006	34203-ORDEQ	Milton Creek 0.2 miles US of Old Portland Rd (Scappoose Bay)			16	30	31	30	31	31	30	30		
2006	34207-ORDEQ	Scappoose Creek 0.5 miles US of West Lane Rd				20	31	30	31	31	30	30		
2006	34209-ORDEQ	Scappoose Bay at Marker #3 (Multnomah, Columbia)	31	28	31	30	31	30	31	31	30	30		
2006	35913-ORDEQ	Clark Creek at Ewald Ave (Pringle Cr Trib)										8	30	31
2006	35914-ORDEQ	Pringle Creek at Pringle Park (Willamette)											24	31
2006	35916-ORDEQ	East Fork of Pringle Creek at Trelstad Ave. (Willamette)											13	28
2006	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	30	31	24	12	1	30	31	30	31
2006	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					22	30	31	31	30	31	1	
2006	WNF-021	Cone_WT						24	31	31	21			
2006	WNF-093	QuartzSouth_WT						23	31	31	14			
2006	WNF-146	MillForestBoundary_WT						27	31	31	17			
2006	WNF-147	MillHwy126_WT						27	31	31	17			
2007	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	27	31	30	31
2007	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14166000	Willamette River At Harrisburg, OR	31	28	31	30	29	30	31	31	30	31	30	31
2007	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	29
2007	14181750	Rock Creek Near Mill City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14182400	Little N Santiam R Blw Canyon Ck, Near Mehama, OR											15	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR										8	30	31
2007	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	29
2007	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	30	29
2007	14197900	Willamette River At Newberg, OR	30	28	31	30	30	30	30	31	29	31	29	30
2007	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	29	31	30	31	31	30	31	29	31
2007	14210000	Clackamas River At Estacada, OR	19	28	31	30	31	30	31	31	30	31	30	31
2007	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	21838-ORDEQ	Glenn Creek at River Mile 5.45								20	30	25	30	31
2007	28713-ORDEQ	Mill Creek at Turner Road (tributary to Willamette River at River Mile 84)	17	27	31	25			21	29	21	15	30	31
2007	28961-ORDEQ	Mill Creek at Front Street NE, Salem (tributary to Willamette River at River Mile 84)							13	31	30	1		
2007	28964-ORDEQ	Clark Creek at mouth (tributary to Pringle Creek at River Mile 1.05)	7	26	31	24			15	31	30	23	30	31
2007	34489-ORDEQ	Q Street Canal, 75 feet u/s of Dynea outfall							15	14				

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	34490-ORDEQ	Q Street Canal, 30 feet d/s of Dynea outfall (concrete pipe near concrete structure)							15	31	30	29		
2007	34491-ORDEQ	Q Street Canal, 50 feet u/s of Pierce Channel mouth							15	31	30	29		
2007	34492-ORDEQ	Q Street Canal, mouth of Pierce Channel							15	31	30	29		
2007	34496-ORDEQ	Q Street Canal, 10 feet u/s of fish barrier							15	31	30	29		
2007	34498-ORDEQ	Q Street Canal, mouth of Canoe Channel							15	31	30	29		
2007	34499-ORDEQ	Q Street Canal, Alton Baker Parkway spillway near Willamette River							15	31	30	29		
2007	34513-ORDEQ	Q Street Canal, 30 feet d/s of Asphalt Composting Company bridge							15	34*	32*	31		
2007	35913-ORDEQ	Clark Creek at Ewald Ave (Pringle Cr Trib)	7	27	31	24			15	31	30	25	30	31
2007	35914-ORDEQ	Pringle Creek at Pringle Park (Willamette)	1	26	31	17			13	31	30	15	29	31
2007	35916-ORDEQ	East Fork of Pringle Creek at Trelstad Ave. (Willamette)	2	27	30	25			22	31	30	16	30	31
2007	35917-ORDEQ	Mill Creek at North Salem High School		21	31	16			21	31	30	17	30	31
2007	35923-ORDEQ	Glenn Creek at Wallace Rd.								20	30	26	28	25
2007	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	30	30				10	31	30	31
2007	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					24	30	31	31	30	31	7	
2007	WNF-021	Cone_WT						26	31	31	18			
2007	WNF-033	ElkNorth_WT						26	31	31	18			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	WNF-093	QuartzSouth_WT						24	31	31	18			
2007	WNF-146	MillForestBoundary_WT						24	31	31	18			
2007	WNF-147	MillHwy126_WT						24	31	31	18			
2008	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	26
2008	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	28	31
2008	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14181750	Rock Creek Near Mill City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14182400	Little N Santiam R Blw Canyon Ck, Near Mehama, OR	31	29	31	30	31	30	31	31	30	29	29	28
2008	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	29	31	30	31	3						
2008	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	14189050	Santiam River Near Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14192015	Willamette River At Keizer, OR	31	29	29	30	31	30	31	31	30	31	30	31
2008	14197900	Willamette River At Newberg, OR	31	29	31	27	19	30	31	31	30	31	30	31
2008	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	29	31	30	29	30	31	31	30	31	30	31
2008	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211010	Clackamas River Near Oregon City, OR	31	29	31	30	31	30	31	31	21	31	30	31
2008	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	29	31	30	31	30	31	31	30	31	30	10
2008	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	29	31	30	31	30	31	31	29			
2008	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	21838-ORDEQ	Glenn Creek at River Mile 5.45	31	29	30							23	20	2
2008	28961-ORDEQ	Mill Creek at Front Street NE, Salem (tributary to Willamette River at River Mile 84)							26	31	30	14		
2008	28964-ORDEQ	Clark Creek at mouth (tributary to Pringle Creek at River Mile 1.05)	29	29	31				22	31	30	28	30	31
2008	35083-ORDEQ	Yamhill River at LaFayette Hwy.							16	2				
2008	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	31	29	31	30	31	30	31	31	30	30	17	31
2008	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	29	31	30					13	31	30	31
2008	CLK1	Clark Creek at Bush Park	29	29	31	26	31	30	27	31	30	28	30	31
2008	CLK12	Clark Creek at Ewald Ave.	29	29	31	27	31	30	26	31	30	28	30	31
2008	COG_FCI0	Fairview Creek at Eastman Parkway							16	31	29			
2008	COG_FCI1	Fairview Creek at Stark Street							16	31	29			
2008	COG_KCI1	Kelly Creek downstream of MHCC pond							16	31	29			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	COG_KCI4	Kelly Creek at Ironwood Drive							16	31	29			
2008	CRGNSA-001	Benson Lake_be20_LTWT						6	31	5				
2008	CRGNSA-004	Eagle Creek Lower ea74_LTWT					4	30	31	31	30	5		
2008	CRGNSA-011	Multnomah Creek mu15_LTWT						6	31	31	30	5		
2008	CRGNSA-012	Multnomah Creek Upper mu40_LTWT					3	30	31	31	30	5		
2008	CRGNSA-015	Wahkeena Creek wa20_LTWT						6	31	31	30	5		
2008	GLE12	Glenn Creek at Hidden Valley Rd.	31	29	30	19	23	30				23	20	2
2008	GLE3	Glenn Creek at Wallace Rd.	31	26	30	27	31	29	20	31	30	28	30	31
2008	MIC12	Mill Creek at Turner Rd.	26	29	31	28	31	30	26	30	30	26	30	31
2008	MIC3	Mill Creek at North Salem High School	29	29	31	28	31	30	25	31	30	28	30	31
2008	PRI12	East Fork of Pringle Creek at Trelstad Ave.	29	29	31	28	31	30	26	31	30	26	30	22
2008	PRI3	Pringle Creek at Pringle Park	29	29	31	26	31	30	25	28	30	28	30	27
2008	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					30	30	31	31	30	29		
2008	WNF-021	Cone_WT							20	31	14			
2008	WNF-033	ElkNorth_WT							20	31	14			
2008	WNF-127	Walker_WT							22	31	14			
2009	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	28	28	31	30	31	31	30	31	30	31
2009	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14162500	Mckenzie River Near Vida, OR		8	31	30	31	30	31	30	30	31	30	31
2009	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR						6	31	31	30	31	30	31
2009	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	30	30	31	30	31
2009	14181500	North Santiam River At Niagara, OR	26	28	31	30	31	30	31	31	30	31	30	31
2009	14181750	Rock Creek Near Mill City, OR	4											
2009	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	30	30	30	31	30	31	30	31
2009	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	17	31	31	30	31	30	14
2009	14183010	North Santiam River Near Mehama, OR										26	30	31
2009	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR						30	31	31	30	31	30	31
2009	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR		4	31	30	31	30	31	31	30	31	30	31
2009	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	26	23	30	31	30	31
2009	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	30	30	31
2009	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	30	28	28	31	30	31
2009	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211010	Clackamas River Near Oregon City, OR	31	28	28	30	31	30	31	31	19	31	30	31
2009	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	14211542	Crystal Springs Creek At Bybee St, Portland, OR	10	28	31	30	31	30	31	31	30	31	30	31
2009	14211546	Crystal Springs Creek At Mouth At Portland, OR	10	28	31	30	31	30	31	31	30	31	30	31
2009	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211720	Willamette River At Portland, OR	10	28	30	30	30	30	31	31	30	31	30	31
2009	21838-ORDEQ	Glenn Creek at River Mile 5.45	6	8	31	5								
2009	28964-ORDEQ	Clark Creek at mouth (tributary to Pringle Creek at River Mile 1.05)	28	28	31	19								
2009	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	15					14	31	30	31
2009	CLK1	Clark Creek at Bush Park	28	28	31	27	31	30	30	31	30	25	30	30
2009	CLK12	Clark Creek at Ewald Ave.	28	28	31	30	29	30	28	31	30	26	30	31
2009	COG_BCI2	Beaver Creek at Division Street and Troutdale Road					12	30	31	31	30	31	2	
2009	COG_FCI0	Fairview Creek at Eastman Parkway									1	31		
2009	COG_FCI1	Fairview Creek at Stark Street					12	30	31	31	30	31		
2009	COG_KCI1	Kelly Creek downstream of MHCC pond					12	19		25	30	31	2	
2009	COG_KCI4	Kelly Creek at Ironwood Drive					12	30	31	31	30	31	2	
2009	GLE12	Glenn Creek at Hidden Valley Rd.	6	8	31	30	6		19	5	30	8		
2009	GLE3	Glenn Creek at Wallace Rd.	31	28	31	26	26	15	22	17	30	25	28	31
2009	MIC12	Mill Creek at Turner Rd.	27	28	31	27	31	30	27	31	30	28	30	31
2009	MIC3	Mill Creek at North Salem High School	31	23	5	11		14	28	31	15	29	30	31
2009	PRI12	East Fork of Pringle Creek at Trelstad Ave.	27	28	31	23	31	30	28	31	30	28	30	31
2009	PRI3	Pringle Creek at Pringle Park	28	28	31	30	31	30	28	31	30	19	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				1	31	30	31	31	30			
2009	WNF-021	Cone_WT						14	31	31	30	5		
2009	WNF-033	ElkNorth_WT						14	31	31	30	5		
2009	WNF-127	Walker_WT						19	31	31	30	6		
2010	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	29	31	30	31
2010	14158100	Willamette River At Owosso Bridge At Eugene, OR											21	31
2010	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14162200	Blue River At Blue River, OR	31	28	30	30	31	30	31	31	30	31	30	31
2010	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	23	31	30	31
2010	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	30	30	31
2010	14169000	Long Tom River Near Alvadore, OR	29	28	31	30	31	30	31	31	30	31	30	31
2010	14174000	Willamette River At Albany, OR	17	28	31	30	31	30	31	31	27	31	30	31
2010	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	14183010	North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	29	28	31	30	31	30	31	31	30	31	30	31
2010	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14192015	Willamette River At Keizer, OR	31	27	31	30	31	30	31	31	30	31	30	31
2010	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	29	31	31	30	31	30	31
2010	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	27B070	Kalama River near Kalama						4	31	31	30	31	30	31
2010	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR	31	28	31	30	31	2	9	31	30	12		
2010	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	CLK1	Clark Creek at Bush Park	29	22	30	29	31	30	29	31	30	27	30	31
2010	CLK12	Clark Creek at Ewald Ave.	28	28	30	29	31	30	29	31	30	29	30	31
2010	CRGNSA-002	Bridal Veil Temp Monitor						7	31	31	22			
2010	CRGNSA-011	Multnomah Creek mu15_LTWT					3	30	31	31	30	19		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	GLE12	Glenn Creek at Hidden Valley Rd.		19	31	29	31	30	29	31	26	29	30	31
2010	GLE3	Glenn Creek at Wallace Rd.	29	14	31	28	31	30	28	31	30	24	30	31
2010	MIC12	Mill Creek at Turner Rd.	29	28	31	26	31	28	31	31	30	29	30	31
2010	MIC3	Mill Creek at North Salem High School	9	28	31	29	31	30	29	29	30	29	30	31
2010	P0017	Elrod Slough downstream of Columbia River Correctional Institution							10	31	30	31	30	8
2010	PRI12	East Fork of Pringle Creek at Trelstad Ave.	28	22	31	26	31	27	30	31	30	12		
2010	PRI3	Pringle Creek at Pringle Park	29	28	31	26	31	30	28	31	30	29	30	31
2010	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					22	30	31	31	30	31	23	
2010	WNF-021	Cone_WT						8	31	31	21			
2010	WNF-033	ElkNorth_WT						8	31	31	21			
2010	WNF-097	Ridge_WT						14	31	31	16			
2010	WNF-127	Walker_WT						13	31	31	16			
2011	11321-ORDEQ	Johnson Creek at SE 17th Avenue (Portland)								27	30	5		
2011	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	21	28	31	30	31	30	31	31	30	31	23	
2011	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	30	29	31	30	31
2011	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	30
2011	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14183010	North Santiam River Near Mehama, OR	22	28	31	30	31	30	31	31	30	31	30	31
2011	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14197900	Willamette River At Newberg, OR	31	28	31	30	30	30	30	31	30	31	30	31
2011	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	26	30	31	30	28	29	30	31	30	31
2011	14210000	Clackamas River At Estacada, OR	16						31	31	30	31	30	31
2011	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	31	28	31
2011	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	28	31	30	31	30	31	31	19		28	31
2011	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	29	27
2011	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	30	30	30	30	31
2011	26B070	Cowlitz River at Kelso												19
2011	27B070	Kalama River near Kalama	31	28	31	30	31	31	31	31	31	31	30	31
2011	37384-ORDEQ	veterans & Cottonwood Creeks at confl. w/Johnson Creek, east of I-205								12	30	3		
2011	38674-ORDEQ	Johnson Cr abv Trib at EB 224 on ramp								26	26	3		
2011	38759-ORDEQ	Johnson Cr Trib Deardorff Cr at Mouth								11				
2011	39204-ORDEQ	Johnson Creek near mouth at spring inlet								27	30	5		
2011	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR			9	30	31	25	31	31	30	31	8	
2011	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	CLK1	Clark Creek at Bush Park	29	28	31	28	31	30	31	30	29	28	29	27
2011	CLK12	Clark Creek at Ewald Ave.	29	28	31	28	31	30	31	31	30	28	30	31
2011	COG_BCI1	Beaver Creek at Canyon footbridge					6	30	31	31	30	19		
2011	COG_FairvatGlisan	Fairview Creek at Glisan Road					6	30	31	31	30	24		
2011	COG_FCI1	Fairview Creek at Stark Street					6	30	31	31	30	24		
2011	COG_KCI1	Kelly Creek downstream of MHCC pond					6	30	14	27	30	14		
2011	COG_KCI2	Kelly Creek upstream MHCC pond					6	30	31	31	30	24		
2011	COG_KCI3	Kelly Creek downstream of Kelley Creek detention pond					6	30	31	31	30	24		
2011	CRGNSA-011	Multnomah Creek mu15_LTWT							18	30	30	24		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	CRGNSA-015	Wahkeena Creek wa20_LTWT							18	30	30	24		
2011	GLE12	Glenn Creek at Hidden Valley Rd.	31	28	31	20	30	29	26	31	30	28	30	31
2011	GLE3	Glenn Creek at Wallace Rd.	31	28	24	28	30	29		29	30	28	30	31
2011	MIC12	Mill Creek at Turner Rd.	28	28	31	26	31	26	26	31	28	28	30	31
2011	MIC3	Mill Creek at North Salem High School	31	28	31	25	31	30	31	28	30	27	30	31
2011	PRI12	East Fork of Pringle Creek at Trelstad Ave.					27	29	29	31	30	28	30	31
2011	PRI3	Pringle Creek at Pringle Park	29	28	31	28	31	30	31	31	30	28	30	31
2011	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge										18	29	31
2011	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				6	31	30	31	31	30	25		
2011	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)										21	28	4
2011	WNF-021	Cone_WT						27	31	31	22			
2011	WNF-033	ElkNorth_WT						27	31	31	22			
2011	WNF-080	NFQuartz_WT						29	31	13				
2011	WNF-092	Quartz_North_WT						29	31	31	25			
2011	WNF-097	Ridge_WT					7	30	31	13				
2011	WNF-109	Simmonds_WT						29	31	31	25			
2011	WNF-127	Walker_WT					2	30	31	2				
2012	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	10	29	31	30	31	30	31	31	30	31	30	31
2012	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	29	31	30	31	30	31	31	30	30	30	31
2012	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	24	30	31	30	31
2012	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	26
2012	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14183010	North Santiam River Near Mehama, OR	29	27	31	30	31	30	31	31	30	31	30	31
2012	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14189050	Santiam River Near Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14192015	Willamette River At Keizer, OR	31	29	31	30	31	30	31	31	30	31	9	
2012	14197900	Willamette River At Newberg, OR	19	29	31	25	31	30	18			25	15	31
2012	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	29	31	30	31	29	31	31	30	31	30	31
2012	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211010	Clackamas River Near Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211546	Crystal Springs Creek At Mouth At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	18
2012	14211550	Johnson Creek At Milwaukie, OR	31	25	31	30	31	30	31	31	30	31	30	31
2012	14211720	Willamette River At Portland, OR	30	29	31	29	31	29	31	30	30	31	29	31
2012	26B070	Cowlitz River at Kelso	31	29	31	30	31	31	31	31	30	32*	30	31
2012	27B070	Kalama River near Kalama	31	29	31	30	31	31	31	31	31	31	30	31
2012	37365-ORDEQ	Errol Springs Creek at mouth off SE 42nd St. (T-23)						17	31	31	30	31	7	
2012	37377-ORDEQ	Spring Creek at Harrison Road, Milwaukie, OR						25	31	31	30	31	5	
2012	37384-ORDEQ	veterans & Cottonwood Creeks at confl. w/Johnson Creek, east of I-205						17	31	31	30	31	7	
2012	38755-ORDEQ	Spring Creek u/s of Portland Waldorf School in Milwaukie						25	31	31	30	31	5	
2012	38759-ORDEQ	Johnson Cr Trib Deardorff Cr at Mouth						8	31	26		17	7	
2012	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR				11	24	7	31	31	30	2		
2012	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	CLK1	Clark Creek at Bush Park	31	29	29	26	31	30	31	29	30	28	30	31
2012	CLK12	Clark Creek at Ewald Ave.	31	29	31	25	27	30	31	31	30	1	25	31
2012	COG_BCI1	Beaver Creek at Canyon footbridge						23	31	31	30	31	3	
2012	COG_BCI2	Beaver Creek at Division Street and Troutdale Road						23	31	31	30	31	3	
2012	COG_BurlatHogan	Burlingame Creek at Hogan Road						23	31	31	30	31	3	
2012	COG_FairvatGlisan	Fairview Creek at Glisan Road						23	31	31	30	31	3	
2012	COG_KCI2	Kelly Creek upstream MHCC pond						23	31	31	30	31	3	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	CRGNSA-007	Horsetail Water Temp Probe						18	31	31	30	1		
2012	CRGNSA-013	Oneonta Water Temp Probe						18	31	31	30	1		
2012	GLE12	Glenn Creek at Hidden Valley Rd.	31	29	31	25	31	27	29	31	29	28	30	31
2012	GLE3	Glenn Creek at Wallace Rd.	31	29	29	25	31	30	31	25	30	23	30	31
2012	MIC12	Mill Creek at Turner Rd.	31	29	31	26	31	30	31	27	26	27	30	31
2012	MIC3	Mill Creek at North Salem High School	30	29	31	25	31	30	31	22	30	28	30	31
2012	P0800	Tributary to Willamette River upstream of Riverview Pump Station					22	30	31	21	30	23		
2012	P1104	Upper Columbia Slough downstream of NE 185th Ave						23	31	31	30	25		
2012	P1781	Lower Columbia Slough at Kelley Point Park							29	17	3	22		
2012	PRI12	East Fork of Pringle Creek at Trelstad Ave.	31	29	31	26	31	30	22	31	28	23	30	31
2012	PRI3	Pringle Creek at Pringle Park	31	29	31	26	26	13	24	24	26	23	10	25
2012	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	31	29	30	30	31	30	31	31	30	31	29	31
2012	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				6	31	30	31	31	30	23		
2012	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	31	27	10	29	31	8				28	30	31
2012	WNF-021	Cone_WT					14	30	31	31	20			
2012	WNF-033	ElkNorth_WT					14	30	31	31	20			
2012	WNF-056	Indian_WT					19	30	31	31	18			
2012	WNF-062	Lytle_WT					19	30	31	31	19			
2012	WNF-093	QuartzSouth_WT						29	31	31	19			
2013	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	29	30	31
2013	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14174000	Willamette River At Albany, OR	17	28	31	28	31	30	31	31	30	31	30	30
2013	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	29	31
2013	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14183010	North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14192015	Willamette River At Keizer, OR			12	30	31	30	31	31	30	31	30	31
2013	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	26	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	30
2013	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211542	Crystal Springs Creek At Bybee St, Portland, OR	31	28	31	30	31	30	31	31	30	16		
2013	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211720	Willamette River At Portland, OR	30	28	31	30	31	30	31	31	30	31	30	31
2013	26B070	Cowlitz River at Kelso	31	28	31	30	31	30	31	31	31	31	30	31
2013	27B070	Kalama River near Kalama	31	28	31	30	31	30	31	31	31	31	30	31
2013	37365-ORDEQ	Errol Springs Creek at mouth off SE 42nd St. (T-23)							28	31	30	3		
2013	38680-ORDEQ	Wahoo Cr blw SE Flavel St (Johnson Cr Trib)							28	31	30	3		
2013	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR			3	30	31	30	31	30	30	28		
2013	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	CGT1	Claggett Creek at Mainline Dr NE					30	30	31	31	30	16		
2013	CLK1	Clark Creek at Bush Park	31	28	31	28	31	30	31	31	30	21		
2013	CLK12	Clark Creek at Ewald Ave.	31	28	31	28	31	30	31	31	30	28	30	31
2013	COG_BeaveratGlenO	Beaver Creek at Glen Otto park						26	4	31	6	23		
2013	COG_BurlatHogan	Burlingame Creek at Hogan Road						29	31	31	20			
2013	COG_FairvatBirdsd	Fairview Creek at Birdsdale Road						29	31	31	30	24		
2013	COG_FairvatDivision	Fairview Creek at Division Street						8	31	31	30	24		
2013	COG_FairvatGlisan	Fairview Creek at Glisan Road						29	31	31	30	24		
2013	COG_FCI0	Fairview Creek at Eastman Parkway			5	30	31	30	31	31	30	28		
2013	COG_FCI1	Fairview Creek at Stark Street						29	31	31	30	24		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	COG_KCI1	Kelly Creek downstream of MHCC pond						29	24					
2013	COG_KCI2	Kelly Creek upstream MHCC pond						29	31	31	30	24		
2013	COG_KCI3	Kelly Creek downstream of Kelley Creek detention pond			5	30	31	30	31	31	30	19		
2013	COG_KCI4	Kelly Creek at Ironwood Drive			5	30	31	30	31	31	30	19		
2013	COG_KellyatKane	Kelly Creek at Kane Drive						29	31	31	30	24		
2013	CRO1	Croisan Creek at Courthouse Athletic Club					30	30	31	31	30	16		
2013	CRO10	Croisan Creek at Ballantyne Rd S					30	30	31	31	30	16		
2013	EMSWCD_BCB	Beaver Creek North Fork at 302nd Ave						17	31	31	30	16		
2013	GIB1	Gibson Creek at Wallace Rd NW					30	30	31	31	30	16		
2013	GIB15	Gibson Creek at Brush College Rd NW					30	30	31	31	30	16		
2013	GLE12	Glenn Creek at Hidden Valley Rd.	31	28	31	24	31	30	31	31	29	28	30	31
2013	GLE3	Glenn Creek at Wallace Rd.	31	28	31	24	31	17	31	31	30	28	30	31
2013	MIC12	Mill Creek at Turner Rd.	30	28	30	22	31	28	31	31	30	28	30	31
2013	MIC3	Mill Creek at North Salem High School	29	28	31	21	26	30	31	31	30	29	30	31
2013	MRA1	Mill Race at High St SE					30	30	31	31	30	16		
2013	MRA10	Mill Race at Mill Race Park					30	30	31	31	30	16		
2013	PRI12	East Fork of Pringle Creek at Trelstad Ave.	31	28	31	27	31	29	31	31	25	17	30	31
2013	PRI3	Pringle Creek at Pringle Park	29	22	4			30	31	31	30	27	30	31
2013	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	31	28	30	30	31	30	31	31	30	31	29	31
2013	SHE1	Shelton Ditch at Church St SE					30	30	31	31	30	16		
2013	SHE10	Shelton Ditch at State Printing Office					30	30	31	31	30	16		
2013	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				8	31	30	31	31	30	29		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	31	28	30	30	31	18				1	25	1
2013	WNF-021	Cone_WT					23	30	31	31	30	20		
2013	WNF-056	Indian_WT					8	30	31	31	30	23		
2013	WNF-062	Lytle_WT					8	30	31	31	30	22		
2014	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	27	28	31	30	31
2014	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	28	31	30	30	30	30	31	29	30	30	31
2014	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	29	26
2014	14174000	Willamette River At Albany, OR	29	28	31	30	31	30	31	31	30	31	30	31
2014	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	29	31	29	31	30	31
2014	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	30	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	14183010	North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	17	30	31	30	31
2014	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	24	28
2014	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14210000	Clackamas River At Estacada, OR	24	28	30	29	31	29	30	31	30	30	29	31
2014	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211500	Johnson Creek At Sycamore, OR	31	26	31	30	31	30	31	31	28	31	30	31
2014	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	28	31	30	31
2014	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	26B070	Cowlitz River at Kelso	31	28	31	30	31	31	31	31	31	31	30	31
2014	27B070	Kalama River near Kalama	31	28	31	30	31	30	31	31	31	31	30	31
2014	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR			4	29	30	30	29	29	28	14		
2014	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	30	31	30	31	31	30	31	21	31
2014	461518123285700	Unnamed Slough, Welch Island, Columbia River, OR				20	31	30	31	4				
2014	CGT1	Claggett Creek at Mainline Dr NE					30	30	31	31	30	16		
2014	CLK1	Clark Creek at Bush Park		1	31	26	31	25	31	31	30	31	27	31
2014	CLK12	Clark Creek at Ewald Ave.	31	28	31	26	31	23	31	31	30	31	27	31
2014	COG_ArrowMouth	Arrow Creek at mouth at Division					3	30	31	31	30	26		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	COG_BCI2	Beaver Creek at Division Street and Troutdale Road					21	30	31	31	30	26		
2014	COG_BeaveratCoch	Beaver Creek at Cochran Road					3	30	31	31	30	26		
2014	COG_BeaveratStark	Beaver Creek at Stark Street					21	30	31	31	30	26		
2014	COG_FairvatBirdsd	Fairview Creek at Birdsdale Road					21	30	31	31	30	26		
2014	COG_FairvatDivision	Fairview Creek at Division Street					21	30	31	31	30	26		
2014	COG_FairvatGlisan	Fairview Creek at Glisan Road					21	30	31	31	30	26		
2014	COG_FCI0	Fairview Creek at Eastman Parkway					21	30	30	31	30	26		
2014	COG_FCI1	Fairview Creek at Stark Street					21	30	31	31	30	26		
2014	COG_KCI2	Kelly Creek upstream MHCC pond					21	30	31	31	30	26		
2014	COG_KellyatKane	Kelly Creek at Kane Drive					21	30	31	31	30	26		
2014	CRGNSA-008	McCord Water Temp Monitor							15	31	30	15		
2014	CRGNSA-009	Moffett Water Temperature Monitor							15	31	30	15		
2014	CRO1	Croisan Creek at Courthouse Athletic Club					30	30	31	31	30	16		
2014	CRO10	Croisan Creek at Ballantyne Rd S					30	30	31	31	30	16		
2014	EMSWCD_BCB	Beaver Creek North Fork at 302nd Ave					8	30	31	31	30	8		
2014	EMSWCD_BCC	Beaver Creek South Fork at 302nd Ave					8	30	10					
2014	EMSWCD_Beaver_Cory	Beaver Creek at confluence of North and South Forks					8	30	31	31	30	8		
2014	GIB1	Gibson Creek at Wallace Rd NW					30	30	31	31	30	16		
2014	GIB15	Gibson Creek at Brush College Rd NW					30	30	31	31	30	16		
2014	GLE12	Glenn Creek at Hidden Valley Rd.	31	28	31	28	30	17	29		10	29	30	31
2014	GLE3	Glenn Creek at Wallace Rd.	27	28	31	28	29	27	31	31	30	29	30	31
2014	MIC12	Mill Creek at Turner Rd.	31	27	27	3	25	27	31	25	13	31	30	31
2014	MIC3	Mill Creek at North Salem High School	31	27	31	26	31	23	31	25	13	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	MRA1	Mill Race at High St SE					30	30	31	31	30	16		
2014	MRA10	Mill Race at Mill Race Park					30	30	31	31	30	16		
2014	PRI12	East Fork of Pringle Creek at Trelstad Ave.	31	26	31	26	31	26	31	31	30	31	30	1
2014	PRI3	Pringle Creek at Pringle Park	31	28	31	26	31	22	31	31	30	31	27	31
2014	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	31	28	30	30	31	30	31	31	30	31	29	31
2014	SHE10	Shelton Ditch at State Printing Office					30	30	31	31	30	16		
2014	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				1	31	30	31	31	30	16		
2014	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	31	28	31	30	31	6				30	30	31
2014	WNF-021	Cone_WT					28	30	31	31	25			
2014	WNF-023	Cougar_WT							13	31	21			
2014	WNF-033	ElkNorth_WT					28	30	31	31	25			
2014	WNF-056	Indian_WT					24	30	31	31	25			
2014	WNF-062	Lytle_WT					24	30	31	31	26			
2015	10375-ORDEQ	Long Tom River at Monroe									15	16	22	
2015	11140-ORDEQ	Long Tom River at Stow Pit Road (Monroe)									15	16	22	
2015	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	30	28	31	31	30	31	30	31
2015	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14181500	North Santiam River At Niagara, OR	31	28	30	30	31	30	31	31	30	31	30	31
2015	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	6
2015	14183010	North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	9	
2015	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	30	31	30	31	30	31
2015	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	29
2015	14210000	Clackamas River At Estacada, OR	31	27	30	30	31	30	31	31	29	31	30	30
2015	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14211500	Johnson Creek At Sycamore, OR	31	28	30	30	31	30	31	31	30	31	30	31
2015	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	25373-ORDEQ	Long Tom River at Bundy Bridge near mouth										4	22	
2015	26750-ORDEQ	Long Tom River near River Mile 12.3									15	16	22	
2015	26B070	Cowlitz River at Kelso	31	28	31	30	31	30	31	31	31	31	30	31
2015	27B070	Kalama River near Kalama	31	28	31	30	31	30	31	31	31	31	30	31
2015	444728122450000	North Santiam River At Geren Island, Nr Stayton,OR			2	15	1	22	30	30	29	31	30	21
2015	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	28	31	30	31	31	30	31	30	31
2015	CGT5	Claggett Creek at Hawthorne St NE					30	30	31	31	30	31	29	31
2015	CLK1	Clark Creek at Bush Park	31	28	31	30	31	30	31	31	30	28	30	31
2015	CLK12	Clark Creek at Ewald Ave.	31	28	31	30	31	30	31	31	30	21		8
2015	COG_ArrowMouth	Arrow Creek at mouth at Division					9	30	31	31	30	19		
2015	COG_BCI2	Beaver Creek at Division Street and Troutdale Road					9	30	31	31	30	19		
2015	COG_BeaveratCoch	Beaver Creek at Cochran Road					9	30	31	31	30	19		
2015	COG_BeaveratGlenO	Beaver Creek at Glen Otto park					9	30	31	31	30	19		
2015	COG_BeaveratStark	Beaver Creek at Stark Street					9	30	31	31	30	19		
2015	COG_BeaverDSKelly	Beaver Creek downstream of confluence with Kelly Creek					9	30	31	31	30	19		
2015	COG_BeaverUSKelly	Beaver Creek upstream of confluence with Kelly Creek					9	30	31	31	30	19		
2015	COG_BurlatHogan	Burlingame Creek at Hogan Road					9	30	31	31	30	19		
2015	COG_FairvatDivision	Fairview Creek at Division Street					9	30	31	31	30	19		
2015	COG_FairvatGlisan	Fairview Creek at Glisan Road					9	30	31	31	30	19		
2015	COG_FCI0	Fairview Creek at Eastman Parkway					9	30	31	31	30	19		
2015	COG_KCI1	Kelly Creek downstream of MHCC pond					9	30	31	31	30	19		
2015	COG_KCI2	Kelly Creek upstream MHCC pond					9	30	31	31	30	19		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	COG_KellyatKane	Kelly Creek at Kane Drive					9	30	31	31	30	19		
2015	CRO1	Croisan Creek at Courthouse Athletic Club					30	30	31	31	30	12		
2015	CRO10	Croisan Creek at Ballantyne Rd S					30	30	31	31	30	12		
2015	EMSWCD_BCB	Beaver Creek North Fork at 302nd Ave					12	30	31	31	30	12		
2015	EMSWCD_BCC	Beaver Creek South Fork at 302nd Ave					12	30	31	31	30	12		
2015	EMSWCD_Beaver_Cory	Beaver Creek at confluence of North and South Forks					3	30	31	31	30	31	23	
2015	GIB1	Gibson Creek at Wallace Rd NW					30	30	31	31	30	12		
2015	GIB15	Gibson Creek at Brush College Rd NW					30	30	31	31	30	12		
2015	GLE12	Glenn Creek at Hidden Valley Rd.	31	28	31	30	31	30	6			2	30	31
2015	GLE3	Glenn Creek at Wallace Rd.	31	28	31	30	31	30	31	31	30	27	30	31
2015	MIC12	Mill Creek at Turner Rd.	31	28	31	30	31	30	31	31	30	29	29	31
2015	MIC3	Mill Creek at North Salem High School	31	28	31	30	31	30	31	31	30	28	30	31
2015	MRA1	Mill Race at High St SE					30	30	31	31	30	12		
2015	MRA10	Mill Race at Mill Race Park					30	30	31	31	30	13		
2015	PRI12	East Fork of Pringle Creek at Trelstad Ave.	2	28	22	30	30	28	31	28	30	27	25	31
2015	PRI3	Pringle Creek at Pringle Park	31	28	31	30	31	30	31	28	30	28	30	31
2015	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	31	28	30	30	31	30	31	31	30	29		
2015	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				1	31	30	31	31	30	31	9	
2015	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	31	28	31	16							13	16
2016	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	30	30	31	30	29
2016	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14155500	Row River Near Cottage Grove, OR	28	29	31	30	31	30	31	31	30	29	30	31
2016	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	30	30	31	30	31	31	30	31	30	30
2016	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14189050	Santiam River Near Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14192015	Willamette River At Keizer, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14197900	Willamette River At Newberg, OR	31	29	31	30	31	29	31	31	30	31	30	31
2016	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	29	30	30	31	30	31	30	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	14210000	Clackamas River At Estacada, OR	31	29	31	30	30	29	31	31	30	30	30	31
2016	14211010	Clackamas River Near Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	30	31	30	31	30	31
2016	26B070	Cowlitz River at Kelso	31	29	31	30	31	30	31	31	31	31	30	31
2016	27B070	Kalama River near Kalama	31	29	31	30	31	30	31	31	31	31	30	31
2016	27C080	Lewis River at Co Rd 16						25	23					
2016	38674-ORDEQ	Johnson Cr abv Trib at EB 224 on ramp					27	30	31	31	30	31	9	
2016	38675-ORDEQ	Johnson Cr below Trib at SB 99E exit to EB hwy 224					27	30	31	31	30	31	9	
2016	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	Beaver_0.0	Beaver Creek at Mouth							24	31	21			
2016	CGT1	Claggett Creek at Mainline Dr NE					30	30	31	29	30	1		
2016	CGT5	Claggett Creek at Hawthorne St NE	31	29	28		30	30	25		28	1		
2016	CLK1	Clark Creek at Bush Park	31	29	31	23	31	30	31	31	30	29	29	31
2016	CLK12	Clark Creek at Ewald Ave.	31	29	31	28	31	30	31	31	30	29	30	31
2016	COG_BeaveratGlenO	Beaver Creek at Glen Otto park					24	30	31	31	30	31	3	
2016	COG_BeaverDSKelly	Beaver Creek downstream of confluence with Kelly Creek					24	30	31	31	30	31	3	
2016	COG_BeaverUSKelly	Beaver Creek upstream of confluence with Kelly Creek					24	30	31	31	30	31	3	
2016	COG_FairvatBirdsd	Fairview Creek at Birdsdale Road					24	30	31	31	30	31	3	
2016	COG_FairvatDivision	Fairview Creek at Division Street					24	30	31	31	30	31	3	
2016	COG_FairvatGlisan	Fairview Creek at Glisan Road					24	30	31	31	30	31	3	
2016	COG_FCI0	Fairview Creek at Eastman Parkway					24	30	31	31	30	31	3	
2016	COG_FCI1	Fairview Creek at Stark Street					24	30	31	31	30	31	3	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	COG_KCI2	Kelly Creek upstream MHCC pond					24	30	31	31	30	31	3	
2016	COG_KellyUSGolf	Kelly Creek upstream of Gresham Golf Course					24	30	31	31	30	31	3	
2016	CRGNSA-004	Eagle Creek Lower ea74_LTWT				29	31	30	31	24				
2016	CRO1	Croisan Creek at Courthouse Athletic Club					30	30	31	29	30	1		
2016	CRO10	Croisan Creek at Ballantyne Rd S					30	30	31	29	30	1		
2016	EMSWCD_Beaver_Cory	Beaver Creek at confluence of North and South Forks					19	30	31	31	30	24		
2016	EMSWCD_Beaver_Freuler	Beaver Creek South Fork downstream of BCC					19	28	31	31	30	11		
2016	EMSWCD_Big_Black	Big Creek at Hurlburt Rd.					19	30	31	31	30	10		
2016	EMSWCD_Big_Fishel_Howard	Howard Creek upstream up Littlepage Rd.					19	30	31	31	30	10		
2016	EMSWCD_Big_Fishel_Main	Big Creek downstream of confluence of all major tributaries.					19	30	31	31	30	10		
2016	EMSWCD_Big_Fishel_Pounder	Pounder Creek at Pounder Rd.					19	30	31	31	30	10		
2016	EMSWCD_Smith_Murphy	Smith Creek downstream of Christensen Rd.					19	30	31	31	30	6		
2016	GIB1	Gibson Creek at Wallace Rd NW					30	30	31	29	30			
2016	GIB15	Gibson Creek at Brush College Rd NW					30	30	31	29	30	1		
2016	GLE12	Glenn Creek at Hidden Valley Rd.	31	29	31	29	31	30	31	9		27	30	31
2016	GLE3	Glenn Creek at Wallace Rd.	31	18	31	29	31	30	31	31	30	26	30	31
2016	MIC12	Mill Creek at Turner Rd.	31	29	31	28	31	30	31	31	30	26	30	31
2016	MIC3	Mill Creek at North Salem High School	31	29	31	23	31	30	31	31	30	29	30	31
2016	MRA1	Mill Race at High St SE					30	30	31	29	30	1		
2016	MRA10	Mill Race at Mill Race Park					30	30	31	29	30	1		
2016	P0316	Veteran’s Creek downstream of Lincoln Memorial Cemetery Pond							5	31	30	31	29	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	P0337	Lower Columbia Slough downstream of Vancouver Bridge					7	30	31	31	30	31	10	
2016	P0800	Tributary to Willamette River upstream of Riverview Pump Station					22	30	31	31	30	31	1	
2016	P1104	Upper Columbia Slough downstream of NE 185th Ave					7	30	31	31	30	31	9	
2016	P1184	Johnson Creek at Eastside Plating 1,2,3					27	30	31	31	30	31	14	
2016	P1212	Johnson Creek at Brookside Wetland					27	30	31	31	30	31	14	
2016	P1292	Crystal Springs at 2215 SE Miller St					27	30	31	31	30	31	16	
2016	P1312	Riverview Tributary to Willamette River South of Lewis and Clark College					22	30	31	16				
2016	P1360	Wilkes Creek at NE 154th Ave					1	30	31	31	6			
2016	P1376	Johnson Creek downstream of SE Bell Ave					27	30	31	31	30	31	14	
2016	P1404	Johnson Creek downstream of Leach Botanical Gardens					27	30	31	31	30	31	14	
2016	P1473	Whitaker Slough near confluence with Middle Columbia Slough					1	30	31	31	30	31	10	
2016	P1593	Miller Creek downstream of Wildwood Trail								29	30	31	9	
2016	P1872	Nettle Creek West of Iron Mountain Bridge					1	30	31	31	30	31	1	
2016	P1916	Veteran’s Creek near 9908 SE Mt. Scott Blvd								15	30	31	29	
2016	P2000	Tryon Creek downstream of High Bridge					1	30	31	31	30	31	1	
2016	P2384	Tributary to Tryon Creek upstream of Cedar Trail						11	31	31	30	31	1	
2016	PRI12	East Fork of Pringle Creek at Trelstad Ave.	28	29	31	23	31	30	31	31	30	26	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	PRI3	Pringle Creek at Pringle Park	31	29	31	23	31	30	31	31	30	29	30	31
2016	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge				29	31	30	31	31	30	31	29	31
2016	Sandy_3.0	Sandy River Above Beaver Creek							22	31	21			
2016	SHE1	Shelton Ditch at Church St SE					30	30	31	29	30	1		
2016	SHE10	Shelton Ditch at State Printing Office					30	30	31	29	30	1		
2016	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				2	31	30	31	31	30	31	1	
2016	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)		28	31	30	25					13	30	31
2016	WNF-021	Cone_WT						27	31	31	6			
2016	WNF-033	ElkNorth_WT						27	31	31	6			
2016	WNF-056	Indian_WT						23	31	31	27			
2016	WNF-062	Lytle_WT						23	31	31	27			
2016	WNF-093	QuartzSouth_WT						23	31	31	27			
2016	WNF-127	Walker_WT						26	31	31	5			
2017	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	28	31	30	31	31	30	31	30	31
2017	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	28
2017	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR							20	31	30	31	30	31
2017	14163900	Mckenzie River Near Walterville, OR							20	31	30	31	29	31
2017	14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR							20	31	30	31	30	31
2017	14164700	Cedar Creek At Springfield, OR							21	31	30	31	30	31
2017	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14210000	Clackamas River At Estacada, OR	31	28	25	30	31	30	31	31	30	31	30	31
2017	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	18	31	31	30	31	30	31
2017	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	23775-ORDEQ	Hamilton Creek at Belinger Scale Road at golf course								30	30	4		
2017	23777-ORDEQ	McDowell Creek at 5.7 miles up McDowell Creek Road								30	30	4		
2017	26B070	Cowlitz River at Kelso	31	28	31	30	31	30	31	31	31	31	30	31
2017	27B070	Kalama River near Kalama	31	28	31	30	31	30	31	31	31	31	30	31
2017	32653-ORDEQ	Turnbow Creek at High Pass Road, RM 0.88 (Owens Creek, Bear Creek, Long Tom R., Upper Willamette)					16	30	24	31	30	26		
2017	37300-ORDEQ	Gettings Cr at Sears Rd								23	30	31	30	17
2017	37376-ORDEQ	Spring Creek at mouth, outlet to Johnson Creek near Hwy. 224 (T-37)					13	30	31	31	30	15		
2017	38674-ORDEQ	Johnson Cr abv Trib at EB 224 on ramp					13	30	31	30	30	16		
2017	38675-ORDEQ	Johnson Cr below Trib at SB 99E exit to EB hwy 224					13	30	31	31	30	17		
2017	39130-ORDEQ	Milton Cr DS of Old Portland Rd on Boise Cascade side of road						2	31	31	30	10		
2017	39204-ORDEQ	Johnson Creek near mouth at spring inlet								7	30	15		
2017	39446-ORDEQ	Flat Cr US Junction City outfall (RM 9.5)					9					1	13	
2017	39447-ORDEQ	Flat Cr at Ferguson Rd (RM 6.7)					9					1	13	
2017	39448-ORDEQ	Flat Cr at 99W (RM 5.2)					9					1	13	
2017	39449-ORDEQ	Flat Cr at Old River Rd (RM 2.5)					9					1	13	
2017	39450-ORDEQ	Flat Cr at Cox Butte Rd (RM 8.0)										1	13	
2017	40069-ORDEQ	McDowell Creek at Berlin Road								30	30	5		
2017	40070-ORDEQ	Hamilton Creek at Upper Berlin Rd								30	30	4		
2017	40073-ORDEQ	Ferguson Creek 0.1 miles upstream of Eber Creek confluence					16	30	22	31	30	23		
2017	40087-ORDEQ	Ferguson Creek SFK at RM 0.48					16	30	22	31	30	23		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	40088-ORDEQ	Ferguson Ck 270 Meters DS SFK Mouth					16	30	22	31	30	23		
2017	40089-ORDEQ	Ferguson CK 0.1 Miles DS of Territorial RD					16	30	22	31	30	23		
2017	40090-ORDEQ	Turnbow Creek 0.6 miles US of Owens Creek confluence					16	30	24	31	30	26		
2017	40091-ORDEQ	Owen's CK 0.3 miles US of Turnbow CK confluence					16	30	24	31	30	26		
2017	40092-ORDEQ	Owens Ck US of Bear CK confluence					16	30	24	1	14	26		
2017	40094-ORDEQ	Gettings CK 60 yds DS of crossing								23	30	31	30	17
2017	40239-ORDEQ	Johnson Creek DS from Harrison St outfall								7	30	15		
2017	40316-ORDEQ	Milton Creek 85 m below W Kappler Rd						1	31	31	30	11		
2017	40371-ORDEQ	Gettings Creek North Fork DS of Witcher Gateway Rd								23	30	31	7	
2017	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	27	19	30	31	30	31	31	30	31	30	7
2017	CGT1	Claggett Creek at Mainline Dr NE					30	30	31	31	30	4		
2017	CGT5	Claggett Creek at Hawthorne St NE					30	30	19	17	30	4		
2017	CLK1	Clark Creek at Bush Park	29	5	31	30	31	30	31	31	30	27	5	18
2017	CLK12	Clark Creek at Ewald Ave.	31	28	31	30	31	30	31	31	30	28	30	31
2017	COG_BCI2	Beaver Creek at Division Street and Troutdale Road					18	30	31	31	30	3		
2017	COG_BeaveratGlenO	Beaver Creek at Glen Otto park					18	30	31	31	30	3		
2017	COG_BeaverDSKelly	Beaver Creek downstream of confluence with Kelly Creek					18	30	31	31	30	3		
2017	COG_BeaverUSKelly	Beaver Creek upstream of confluence with Kelly Creek					18	30	31	31	30	3		
2017	COG_BurlatHogan	Burlingame Creek at Hogan Road					18	30	31	31	30	3		
2017	COG_FairvatBirdsd	Fairview Creek at Birdsdale Road					18	30	31	31	30	3		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	COG_FairvatDivision	Fairview Creek at Division Street					18	30	31	31	30	3		
2017	COG_FairvatGlisan	Fairview Creek at Glisan Road					18	30	31	31	30	9		
2017	COG_FCI0	Fairview Creek at Eastman Parkway					18	30	31	31	30	3		
2017	COG_FCI1	Fairview Creek at Stark Street					18	30	31	31	30	3		
2017	COG_KCI1	Kelly Creek downstream of MHCC pond					18	30	31	31	30	3		
2017	COG_KCI2	Kelly Creek upstream MHCC pond					18	30	31	31	30	3		
2017	COG_KellyUSGolf	Kelly Creek upstream of Gresham Golf Course					18	30	31	31	30	3		
2017	CRGNSA-004	Eagle Creek Lower ea74_LTWT						22	31	29				
2017	CRGNSA-012	Multnomah Creek Upper mu40_LTWT						22	31	29				
2017	CRO1	Croisan Creek at Courthouse Athletic Club					30	30	31	31	30	4		
2017	CRO10	Croisan Creek at Ballantyne Rd S					30	30	22		12	4		
2017	EMSWCD_Beaver_Cory	Beaver Creek at confluence of North and South Forks					7	30	31	31	30	29		
2017	EMSWCD_Beaver_Freuler	Beaver Creek South Fork downstream of BCC					8	30	31	31	30	10		
2017	EMSWCD_Big_Black	Big Creek at Hurlburt Rd.					8	30	31	31	30	10		
2017	EMSWCD_Smith_Guebert	Smith Creek by Hurlburt Rd.					8	30	31	31	30	10		
2017	EMSWCD_Smith_Murphy	Smith Creek downstream of Christensen Rd.					7	30	31	31	30	10		
2017	EMSWCD_Smith_Spencer	Smith Creek downstream of Northway Rd.					8	30	31	31	30	10		
2017	GIB1	Gibson Creek at Wallace Rd NW					30	30	31	31	30	4		
2017	GLE12	Glenn Creek at Hidden Valley Rd.	31	28	31	30	31	30	26			26	30	31
2017	GLE3	Glenn Creek at Wallace Rd.	31	28	31	30	31	30	31	31	30	27	30	31
2017	MIC12	Mill Creek at Turner Rd.	31	28	31	30	30	30	31	31	30	28	30	31
2017	MIC3	Mill Creek at North Salem High School	31	28	31	30	31	30	31	31	30	28	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	MRA1	Mill Race at High St SE					30	30	21	7	30	4		
2017	MRA10	Mill Race at Mill Race Park					30	30	31	31	30	4		
2017	P1612	Johnson Creek near Errol Creek confluence					8	30	31	31	30	31	7	
2017	P1744	Riverview Tributary to Willamette River South of Riverview Cemetery					9	30	31	31	30	31	22	
2017	P1769	Miller Creek upstream of HWY 30					6	22			29	31	22	
2017	P1857	Upper Columbia Slough downstream of Big Four Corners							15	31	6			
2017	P1865	Lower Columbia Slough downstream of St. Johns Landfill Bridge					3	29						
2017	P1936	Tributary to Arnold Creek at Boones Ferry Rd					9	30	31	8				
2017	P2113	Middle Columbia Slough downstream of NE 92nd Dr					2	30	31	31	25			
2017	P2185	Rocking Chair Creek downstream of Leif Erikson Dr					6	30	26	23	30	31	22	
2017	P2208	Johnson Creek at Brookside Apartments					8	30	31	31	30	31	7	
2017	P2318	Upper Balch Creek at NW Cornell Rd and 53rd Ave					9	30	31	31	30	31	22	
2017	P2377	Lower Columbia Slough downstream of N. Portland Rd					2	30	31	24	28	20	3	
2017	P2400	Johnson Creek upstream of SE Bell Ave					8	30	31	31	30	23		
2017	PRI12	East Fork of Pringle Creek at Trelstad Ave.	31	28	31	30	31	30	31	31	30	28	30	31
2017	PRI3	Pringle Creek at Pringle Park	31	28	31	30	31	30	31	31	30	27	30	31
2017	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	31	28	30	30	31	30	31	31	30	31	29	31
2017	SHE1	Shelton Ditch at Church St SE					30	30	31	31	30	4		
2017	SHE10	Shelton Ditch at State Printing Office					29	30	31	31	30	4		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				4	31	30	31	31	30	31	2	
2017	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	31	28	31	30	31						15	31
2017	WNF-021	Cone_WT						10	31	31	30	2		
2017	WNF-033	ElkNorth_WT						10	31	31	30	2		
2017	WNF-056	Indian_WT						10	31	31	30	4		
2017	WNF-062	Lytle_WT						10	31	31	30	3		
2017	WNF-093	QuartzSouth_WT						10	31	31	30	4		
2018	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	29	30	31
2018	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	26	28	31	30	31	30	31	31	30	31	30	31
2018	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	29	31	26	31
2018	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	27	31	30	31	30	31	31	30	31	30	31
2018	14163900	Mckenzie River Near Walterville, OR	31	28	30	30	31	30	30	30	30	31	30	29
2018	14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	30	29	31	31	30	31	30	31
2018	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	28	31	30	31	30	31	31	23	30	30	31
2018	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14192015	Willamette River At Keizer, OR	31	28	31	30	31	30	31	31	30	31	30	28
2018	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	30	31	29	30	30	30	30	30	31
2018	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	29	31
2018	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211720	Willamette River At Portland, OR	31	28	31	29	31	30	31	31	30	31	30	31
2018	23774-ORDEQ	Hamilton Creek at Upper Berlin Road near Berlin Ridge Road						22	31	31	18			
2018	23775-ORDEQ	Hamilton Creek at Belinger Scale Road at golf course						22	31	31	18			
2018	23777-ORDEQ	McDowell Creek at 5.7 miles up McDowell Creek Road						22	31	31	18			
2018	23809-ORDEQ	Columbia River at Marker 14				14	31	30	31	31	30	31	8	
2018	26B070	Cowlitz River at Kelso	31	28	31	30	31	30	31	31	25			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	27B070	Kalama River near Kalama	31	28	31	30	31	30	31	31	25			
2018	27C080	Lewis River at Co Rd 16							21	31	31	31	30	31
2018	32653-ORDEQ	Turnbow Creek at High Pass Road, RM 0.88 (Owens Creek, Bear Creek, Long Tom R., Upper Willamette)				15	31	30	31	31	30	9		
2018	37229-ORDEQ	Bear Branch at Huntley Rd						5	31	31	30	11		
2018	39130-ORDEQ	Milton Cr DS of Old Portland Rd on Boise Cascade side of road									25	31	30	31
2018	40073-ORDEQ	Ferguson Creek 0.1 miles upstream of Eber Creek confluence				15	31	30	31	31	30	25		
2018	40087-ORDEQ	Ferguson Creek SFK at RM 0.48				15	31	30	31	31	30	25		
2018	40088-ORDEQ	Ferguson Ck 270 Meters DS SFK Mouth				15	31	30	31	31	30	25		
2018	40089-ORDEQ	Ferguson CK 0.1 Miles DS of Territorial RD				15	31	30	31	31	30	25		
2018	40090-ORDEQ	Turnbow Creek 0.6 miles US of Owens Creek confluence				15	31	30	31	31	30	9		
2018	40091-ORDEQ	Owen’s CK 0.3 miles US of Turnbow CK confluence				15	31	30	31	31	30	9		
2018	40092-ORDEQ	Owens Ck US of Bear CK confluence				15	31	30	31	31	30	9		
2018	40109-ORDEQ	Unnamed stream at RM 0.41					10	30	31	31	30	29		
2018	40316-ORDEQ	Milton Creek 85 m below W Kappler Rd									25	31	30	31
2018	40371-ORDEQ	Gettings Creek North Fork DS of Witcher Gateway Rd					10	30	31	31	30	29		
2018	40971-ORDEQ	Crystal Springs Creek downstream of pond at base of fish ladder							20	31	30	22		
2018	40972-ORDEQ	Crystal Springs Creek 300 ft downstream							20	31	30	22		
2018	453630122021400	Columbia River, Left Bank, Near Dodson, OR	24	28	31	30	31	30	31	31	30	31	30	31
2018	CGT1	Claggett Creek at Mainline Dr NE					30	30	31	31	30	1		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	CGT5	Claggett Creek at Hawthorne St NE					30	30	31	31	30	1		
2018	CLK1	Clark Creek at Bush Park	30	28	30	30	31	30	31	31	30	29	29	31
2018	CLK12	Clark Creek at Ewald Ave.	30	28	30	26	17	30	31	31	29	28	29	31
2018	COG_BeaverDSKelly	Beaver Creek downstream of confluence with Kelly Creek					23	30	31	31	30	8		
2018	COG_BeaverUSKelly	Beaver Creek upstream of confluence with Kelly Creek					23	30	31	31	30	8		
2018	COG_BeDSBeavDamA	Beaver Creek on MHCC campus downstram of beaver dam							10	31	30	8		
2018	COG_BeUSBeavDamA	Beaver Creek on MHCC campus upstream of beaver dam							10	31	30	8		
2018	COG_KCI1	Kelly Creek downstream of MHCC pond				9	31	30	31	31	30	8		
2018	CRO1	Croisan Creek at Courthouse Athletic Club					30	30	31	31	30	1		
2018	CRO10	Croisan Creek at Ballantyne Rd S					30	30	31	31	30	1		
2018	EMSWCD_Beaver_Cory	Beaver Creek at confluence of North and South Forks				2	31	30	31	31	30	16		
2018	EMSWCD_Smith_Guebert	Smith Creek by Hurlburt Rd.				5	31	30	31	31	30	14		
2018	EMSWCD_Smith_Murphy	Smith Creek downstream of Christensen Rd.				5	31	30	31	31	30	14		
2018	EMSWCD_Smith_Spencer	Smith Creek downstream of Northway Rd.				5	31	30	31	31	30	14		
2018	GIB1	Gibson Creek at Wallace Rd NW					30	30	31	31	30			
2018	GIB15	Gibson Creek at Brush College Rd NW					30	30	31	31	30	1		
2018	GLE12	Glenn Creek at Hidden Valley Rd.	30	28	30	30	31	30	10			12	29	31
2018	GLE3	Glenn Creek at Wallace Rd.	30	28	30	30	31	30	31	31	30	28	29	31
2018	MIC12	Mill Creek at Turner Rd.	30	28	30	30	31	30	31	31	30	29	29	31
2018	MIC3	Mill Creek at North Salem High School	30	28	30	30	31	30	31	31	30	28	29	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	MRA1	Mill Race at High St SE					30	30	31	31	30	1		
2018	MRA10	Mill Race at Mill Race Park					30	30	31	31	30	1		
2018	P0012	Tributary to Stevens Creek downstream of SW Custer St					30	30	31	31	30	31	16	
2018	P0060	Veteran's Creek at SE 101st Ave South of Mt. Scott Blvd					30	30	31	31	27			
2018	P0080	Upper Columbia Slough downstream of NE 185th Ave							2	31	30	31	30	12
2018	P0124	Johnson Creek off SE Barbara Welch Rd near SE Foster Rd					30	30	31	31	30	31	15	
2018	P0129	Upper Columbia Slough Between 148th and 158th Ave							1	31	30	30	30	12
2018	P0144	Nettle Creek East from Andrews Rd on Iron Mountain Trail					30	30	31	31	30	31	16	
2018	P0188	Johnson Creek downstream of SE 110th Dr					30	30	31	31	30	31	15	
2018	P0208	Tryon Creek off North Creek Trail South of SW Boones Ferry Rd					30	30	31	31	30	31	16	
2018	P0250	Balch Creek upstream of Lower Macleay Park					30	30	31	31	30	31	30	31
2018	P0352	Johnson Creek upstream of SE Stanley Ave					30	30	31	31	30	31	16	
2018	P0524	Stephens Creek at Confluence with Willamette River					30	30	31	31	12	27	16	
2018	PRI12	East Fork of Pringle Creek at Trelstad Ave.	30	28	30	30	31	30	31	31	30	29	29	31
2018	PRI3	Pringle Creek at Pringle Park	30	28	30	30	31	30	31	31	30	28	29	31
2018	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	31	28	30	30	31	30	31	31	30	31	29	31
2018	SHE1	Shelton Ditch at Church St SE					30	30	31	31	30	1		
2018	SHE10	Shelton Ditch at State Printing Office					30	30	31	31	30	1		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)					31	30	31	31	30	31	28	
2018	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	31	28	31	30	31							14
2018	WNF-021	Cone_WT					7	30	31	31	30	22		
2018	WNF-033	ElkNorth_WT					7	30	31	31	30	22		
2018	WNF-056	Indian_WT					7	30	31	31	30	6		
2018	WNF-062	Lytle_WT					7	30	31	31	30	7		
2018	WNF-093	QuartzSouth_WT					7	30	31	31	30	8		
2019	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	30	28	31	30	30	30	31	31	30	31	30	31
2019	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	30	31	30	31	30	31
2019	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	28	31	30	31	30	31	31	26	31	30	31
2019	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	29	31	30	31	31	30	29	25	27
2019	14163900	Mckenzie River Near Walterville, OR	31	28	31	29	31	30	31	30	30	31	30	31
2019	14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR	31	28	31	30	31	30	31	31	30	27	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14170000	Long Tom River At Monroe, OR									14	31	30	31
2019	14174000	Willamette River At Albany, OR	31	27	31	30	31	30	31	31	30	31	30	31
2019	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14187500	South Santiam River At Waterloo, OR										30	30	31
2019	14189050	Santiam River Near Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14192015	Willamette River At Keizer, OR	31	28	31	30	30	30	14	30	30	31	30	31
2019	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	29
2019	14202000	Pudding River At Aurora, OR				28	31	30	31	31	30	31	30	31
2019	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	28	31	29	31	30	30	31	30	31	29	31
2019	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	29
2019	14211010	Clackamas River Near Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	23774-ORDEQ	Hamilton Creek at Upper Berlin Road near Berlin Ridge Road					8	30	31	31	30			
2019	23775-ORDEQ	Hamilton Creek at Belinger Scale Road at golf course					7	30	31	31	30	8		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	23777-ORDEQ	McDowell Creek at 5.7 miles up McDowell Creek Road					8	30	31	31	30	9		
2019	27C080	Lewis River at Co Rd 16	31	28	31	30	31	30	31	31	30			
2019	32653-ORDEQ	Turnbow Creek at High Pass Road, RM 0.88 (Owens Creek, Bear Creek, Long Tom R., Upper Willamette)					15	30	31	27	30	30		
2019	37300-ORDEQ	Gettings Cr at Sears Rd					1	30	6	1	30	31	21	
2019	39130-ORDEQ	Milton Cr DS of Old Portland Rd on Boise Cascade side of road	31	28	30	29	31	30	31	31	4		24	31
2019	40069-ORDEQ	McDowell Creek at Berlin Road							14	31	30			
2019	40070-ORDEQ	Hamilton Creek at Upper Berlin Rd					8	30	31	31	30			
2019	40073-ORDEQ	Ferguson Creek 0.1 miles upstream of Eber Creek confluence					15	30	31	31	30	30		
2019	40087-ORDEQ	Ferguson Creek SFK at RM 0.48					15	30	31	31	30	30		
2019	40088-ORDEQ	Ferguson Ck 270 Meters DS SFK Mouth					15	30	31	31	30	30		
2019	40089-ORDEQ	Ferguson CK 0.1 Miles DS of Territorial RD					15	30	31	31	30	30		
2019	40090-ORDEQ	Turnbow Creek 0.6 miles US of Owens Creek confluence					15	30	31	31	30	30		
2019	40091-ORDEQ	Owen’s CK 0.3 miles US of Turnbow CK confluence					15	30	31	31	30	30		
2019	40092-ORDEQ	Owens Ck US of Bear CK confluence					15	30	31	31	30	30		
2019	40094-ORDEQ	Gettings CK 60 yds DS of crossing					1	9			3	31	14	
2019	40109-ORDEQ	Unnamed stream at RM 0.41					1	30	31	31	30	31	21	
2019	40316-ORDEQ	Milton Creek 85 m below W Kappler Rd	31	28	30	30	30	30	31	31	3		24	31
2019	40371-ORDEQ	Gettings Creek North Fork DS of Witcher Gateway Rd								1	30	31	21	
2019	40791-ORDEQ	McDowell Ck at Speasl Rd								19	30	9		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	40792-ORDEQ	Hamilton Ck at 1170m upstream of Bellinger Scale Rd							23	31	30	8		
2019	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	CGT1	Claggett Creek at Mainline Dr NE					30	30	31	31	30	10		
2019	CGT5	Claggett Creek at Hawthorne St NE					30	30	31	31	24	10		
2019	CLK1	Clark Creek at Bush Park	31	28	30	21	31	28	31	31	30	31	27	31
2019	CLK12	Clark Creek at Ewald Ave.	31	28	30	30	31	28	31	31	30	31	27	31
2019	COG_BeaveratGlenO	Beaver Creek at Glen Otto park					30	30	31	31	30			
2019	COG_BeaverDSKelly	Beaver Creek downstream of confluence with Kelly Creek					30	30	31	31	30			
2019	COG_BeaverUSKelly	Beaver Creek upstream of confluence with Kelly Creek					30	30	31	31	30			
2019	COG_BurlatHogan	Burlingame Creek at Hogan Road					30	30	31	31	30			
2019	COG_FairvatBirdsd	Fairview Creek at Birdsdale Road				12	31	30	31	31	30			
2019	COG_FairvatGlisan	Fairview Creek at Glisan Road				12	31	30	31	31	30			
2019	COG_FCI0	Fairview Creek at Eastman Parkway				12	31	30	31	31	30			
2019	COG_FCI1	Fairview Creek at Stark Street				12	31	30	31	31	30			
2019	COG_KCI1	Kelly Creek downstream of MHCC pond				12	31	30	31	31	30			
2019	COG_KCI2	Kelly Creek upstream MHCC pond				12	31	30	31	31	30			
2019	COG_KellyUSGolf	Kelly Creek upstream of Gresham Golf Course					30	30	31	31	30			
2019	CRO1	Croisan Creek at Courthouse Athletic Club					30	30	31	31	30	10		
2019	CRO10	Croisan Creek at Ballantyne Rd S					30	30	31	31	30	10		
2019	CRU	Columbia River Upstream of Outfall 001					31	30	31	31	30	31		
2019	EMSWCD_BCB	Beaver Creek North Fork at 302nd Ave				7	31	30	31	31	30	9		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	EMSWCD_Beaver_Cory	Beaver Creek at confluence of North and South Forks				6	31	30	31	31	30	9		
2019	EMSWCD_Beaver_Freuler	Beaver Creek South Fork downstream of BCC				6	31	30	31	31	30	9		
2019	EMSWCD_Big_Black	Big Creek at Hurlburt Rd.				7	31	30	31	31	30	9		
2019	EMSWCD_Smith_Guebert	Smith Creek by Hurlburt Rd.				7	31	30	31	31	30	9		
2019	EMSWCD_Smith_Murphy	Smith Creek downstream of Christensen Rd.				7	31	30	31	31	30	9		
2019	GIB1	Gibson Creek at Wallace Rd NW					30	30	31	31	30	10		
2019	GIB15	Gibson Creek at Brush College Rd NW					30	30	31	31	30	10		
2019	GLE12	Glenn Creek at Hidden Valley Rd.	31	28	30	30	29	16	1		19	29	29	30
2019	GLE3	Glenn Creek at Wallace Rd.	31	28	30	30	29	16	31	31	30	29	29	31
2019	MIC12	Mill Creek at Turner Rd.	31	28	30	30	31	28	31	31	30	29	29	31
2019	MIC3	Mill Creek at North Salem High School	31	28	30	29	31	27	31	31	30	31	27	31
2019	MRA1	Mill Race at High St SE					30	30	31	31	30	10		
2019	MRA10	Mill Race at Mill Race Park					30	30	31	31	30	10		
2019	P0526	Tributary to Balch Creek at NW Thompson Rd upstream of Cornell Rd					30	30	31	31	30	31	5	
2019	P0529	Middle Columbia Slough across from Oregon Air National Guard					2	30	31	31	8			
2019	P0544	Johnson Creek downstream of SE Ochoco St					30	30	31	31	30	31	7	
2019	P0592	Tributary to Tryon Creek downstream of Red Fox Bridge					19	30	31	31	30	31	4	
2019	P0633	Newton Creek downstream of Newton Trail					6	26	31	31	30	31	7	
2019	P0705	Middle Columbia Slough upstream of Whitaker Slough Confluence									12	31	14	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	P0720	Riverview Tributary to Willamette River North of Lewis and Clark College					19	30	31	31	30	31	4	
2019	P0754	Falling Creek near SW Jonathan Ct					19	30	31	31	30	31	5	
2019	P0762	Balch Creek off Wildwood Trail near Stone House					30	30	31	31	30	31	5	
2019	P0828	Tributary to Johnson Creek along SE Deardorff Rd near covered bridge										25	7	
2019	P0892	Johnson creek upstream of SE 100th Ave					10	30	31	31	30	31	25	
2019	P0961	Middle Columbia Slough upstream of NE 21st Ave					2	30	31	31	30	31	14	
2019	P1020	Kelley Creek downstream of SE 159th Dr					10	30	31	31	30	31	7	
2019	PRI12	East Fork of Pringle Creek at Trelstad Ave.	29	28	30	30	31	28	31	30	30	29	29	31
2019	PRI3	Pringle Creek at Pringle Park	31	28	30	30	31	28	31	31	30	31	27	31
2019	PWB_Beavr_Canyn	In Beaver Creek Canyon near site of old upstream footbridge	31	28	30	30	5							
2019	SHE1	Shelton Ditch at Church St SE					30	30	31	31	30	10		
2019	SHE10	Shelton Ditch at State Printing Office					30	30	31	31	30	10		
2019	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				15	31	30	31	31	30	31	5	
2019	VNB	N Vancouver St Bridge (Main Channel - Columbia Slough)	31	28	30	30	31							
2019	WNF-021	Cone_WT							31	31	30	2		
2019	WNF-056	Indian_WT						4	31	31	30	2		
2019	WNF-062	Lytle_WT						3	31	31	30	2		
2019	WNF-093	QuartzSouth_WT						3	31	31	30	9		
2020	10787-ORDEQ	Mcdowell Creek at Bench Mark 456					4	30	31	27	30	15		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	29	31
2020	14158100	Willamette River At Owosso Bridge At Eugene, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14162200	Blue River At Blue River, OR	30	29	31	30	31	28	31	31	30	31	30	31
2020	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	22	31	30	30
2020	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	29	31	31	30	31	30	31
2020	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	29	28	29	31	28	31	30	31
2020	14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR	31	29	31	30	31	30	31	31	15	8	28	31
2020	14164700	Cedar Creek At Springfield, OR	31	29	31	30	31	30	27	30	30	31	30	31
2020	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14165500	Mckenzie River Near Coburg, OR										4	30	31
2020	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	14183020	North Santiam River Blw Stout Creek, Nr Mehama, OR									9	31	29	31
2020	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	29	31	30	31	30	31	31	28	30	30	31
2020	14186200	Middle Santiam R Blw Green Peter Dam Nr Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14189050	Santiam River Near Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	29
2020	14192015	Willamette River At Keizer, OR	31	29	31	30	31	29		9	30	31	30	23
2020	14197900	Willamette River At Newberg, OR	31	28	28	30	31	29	31	31	29	30	29	31
2020	14202000	Pudding River At Aurora, OR	31	29	31	19								
2020	14207200	Tualatin River At Oswego Dam, Near West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	30	30	31
2020	14211010	Clackamas River Near Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	23774-ORDEQ	Hamilton Creek at Upper Berlin Road near Berlin Ridge Road					5	30	31	31	30	13		
2020	23775-ORDEQ	Hamilton Creek at Belinger Scale Road at golf course					3	30	31	31	30	15		
2020	23777-ORDEQ	McDowell Creek at 5.7 miles up McDowell Creek Road					4	30	31	31	30	13		
2020	32653-ORDEQ	Turnbow Creek at High Pass Road, RM 0.88 (Owens Creek, Bear Creek, Long Tom R., Upper Willamette)					2	30	31	31	30	28		
2020	39130-ORDEQ	Milton Cr DS of Old Portland Rd on Boise Cascade side of road	31	29	30	30	31	30	31	31	30	6		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	40070-ORDEQ	Hamilton Creek at Upper Berlin Rd					5	30	31	31	30	13		
2020	40073-ORDEQ	Ferguson Creek 0.1 miles upstream of Eber Creek confluence					2	30	31	31	30	28		
2020	40087-ORDEQ	Ferguson Creek SFK at RM 0.48					2	30	31	31	30	28		
2020	40088-ORDEQ	Ferguson Ck 270 Meters DS SFK Mouth					2	30	31	31	30	28		
2020	40089-ORDEQ	Ferguson CK 0.1 Miles DS of Territorial RD					2	30	31	31	30	28		
2020	40090-ORDEQ	Turnbow Creek 0.6 miles US of Owens Creek confluence					2	30	20	18	19			
2020	40091-ORDEQ	Owen’s CK 0.3 miles US of Turnbow CK confluence					2	18						
2020	40092-ORDEQ	Owens Ck US of Bear CK confluence						22	31	31	30	28		
2020	40316-ORDEQ	Milton Creek 85 m below W Kappler Rd	31	29	30	30	19							
2020	40791-ORDEQ	McDowell Ck at Speasl Rd					4	30	31	31	30	13		
2020	40792-ORDEQ	Hamilton Ck at 1170m upstream of Bellinger Scale Rd					5	30	31	31	30	15		
2020	453630122021400	Columbia River, Left Bank, Near Dodson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	CLK1	Clark Creek at Bush Park	31	29	30	30	31	29	31	31	30	29	30	30
2020	CLK12	Clark Creek at Ewald Ave.	31	28	30	30	31	29						
2020	COG_BCI2	Beaver Creek at Division Street and Troutdale Road					31	29	31	31	30	20		
2020	COG_BeaverDSKelly	Beaver Creek downstream of confluence with Kelly Creek					31	29	31	31	30	20		
2020	COG_BeaverUSKelly	Beaver Creek upstream of confluence with Kelly Creek					31	29	31	31	30	20		
2020	COG_Burl@Culvert	Burlingame Creek at ditch from culvert on Hogan					31	29	31	31	30	20		
2020	COG_Burl@Golf	Burlingame Creek on Gresham Golf Course upstream of Kelly Creek					31	29	31	31	30	20		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	COG_Burl@Hogan	Burlingame Creek at Hogan Road					31	29	31	31	30	20		
2020	COG_Fairv@Birdsd	Fairview Creek at Birdsdale Road					31	29	31	31	30	20		
2020	COG_Fairv@Glisan	Fairview Creek at Glisan Road					31	29	31	31	30	20		
2020	COG_FCI0	Fairview Creek at Eastman Parkway					31	29	31	31	30	20		
2020	COG_FCI1	Fairview Creek at Stark Street					31	29	31	31	30	20		
2020	COG_KCI1	Kelly Creek downstream of MHCC pond					31	29	31	31	30	20		
2020	COG_KCI2	Kelly Creek upstream MHCC pond					31	29	31	25	19	20		
2020	COG_KellyUSGolf	Kelly Creek upstream of Gresham Golf Course					31	29	31	29	19	20		
2020	GLE12	Glenn Creek at Hidden Valley Rd.	31	29	30	30	31	29						12
2020	GLE3	Glenn Creek at Wallace Rd.	31	29	30	30	31	29				22	17	19
2020	MIC12	Mill Creek at Turner Rd.	31	10	13	30	31	28	30	31	30	29	30	30
2020	MIC3	Mill Creek at North Salem High School	31	29	30	30	31	29						
2020	P0800	Tributary to Willamette River upstream of Riverview Pump Station							11	31	30	31	12	
2020	P1104	Upper Columbia Slough downstream of NE 185th Ave					18	30	31	31	30	31	30	21
2020	P1184	Johnson Creek at Eastside Plating 1,2,3					25	30	31	31	30	31	30	7
2020	P1212	Johnson Creek at Brookside Wetland					25	30	31	31	30	31	30	7
2020	P1292	Crystal Springs at 2215 SE Miller St					25	30	2					
2020	P1376	Johnson Creek downstream of SE Bell Ave					25	30	31	31	30	31	30	7
2020	P1404	Johnson Creek downstream of Leach Botanical Gardens					25	30	31	31	30	20		
2020	P1593	Miller Creek downstream of Wildwood Trail					20	30	31	31	30	31	30	2
2020	P1872	Nettle Creek West of Iron Mountain Bridge					11	30	31	31	30	31	30	2

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	P1916	Veteran's Creek near 9908 SE Mt. Scott Blvd					25	30	31	31	30	31	30	7
2020	P2000	Tryon Creek downstream of High Bridge					11	30	31	31	30	31	30	2
2020	P2384	Tributary to Tryon Creek upstream of Cedar Trail					8	30	31	31	30	31	12	
2020	PRI12	East Fork of Pringle Creek at Trelstad Ave.	31	29	30	30	31	22	21	31	30	29	30	30
2020	PRI3	Pringle Creek at Pringle Park	31	29	30	30	31	29						
2020	TC-4	Tryon Creek at 10750 SW Boones Ferry Rd (Downstream of Culvert)				3	31	30	31	3		26	9	

* Some stations have more daily maximum results than the number of days in the month due to multiple probes being deployed at the same location or due to duplicate entries in AWQMS. These data are not proposed to support the modeling so we did not investigate these specific situations further.

Appendix C Stream flow data summary

Table 52: Continuous flow measurements available from the USGS flow gaging stations in the Willamette River mainstem and major tributaries QAPP project area.

Station ID	Station	Latitude/Longitude
14142800	Beaver Creek At Troutdale, OR	45.51929/-122.389
14144700	Columbia River At Vancouver, Wa	45.62067/-122.6734
14144805	Flushing Channel At Vancouver Lk At Vancouver, Wa	45.66873/-122.7448
14150000	Middle Fork Willamette River Near Dexter, OR	43.94568/-122.8373
14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	43.94429/-122.7748
14152000	Middle Fork Willamette River At Jasper, OR	43.99818/-122.9059
14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	43.72068/-123.0498
14155500	Row River Near Cottage Grove, OR	43.7929/-122.9915
14157500	Coast Fork Willamette River Near Goshen, OR	43.9804/-122.9665
14159110	Mckenzie River Above South Fork, Near Rainbow, OR	44.16638/-122.2565
14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	44.04707/-122.2178
14159500	South Fork Mckenzie River Near Rainbow, OR	44.13596/-122.2484
14162200	Blue River At Blue River, OR	44.16235/-122.3331
14162500	Mckenzie River Near Vida, OR	44.12485/-122.4706
14163000	Gate Creek At Vida, OR	44.14568/-122.572
14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	44.12374/-122.6276
14163900	Mckenzie River Near Walterville, OR	44.06985/-122.7712
14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR	44.07067/-122.8847
14164700	Cedar Creek At Springfield, OR	44.05935/-122.9197
14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	44.07124/-122.9645
14165500	Mckenzie River Near Coburg, OR	44.11306/-123.047
14166000	Willamette River At Harrisburg, OR	44.2704/-123.1737
14169000	Long Tom River Near Alvadore, OR	44.12346/-123.2998
14170000	Long Tom River At Monroe, OR	44.3129/-123.2965
14171600	Willamette River At Corvallis, OR	44.56636/-123.2568
14174000	Willamette River At Albany, OR	44.63873/-123.1068
14181500	North Santiam River At Niagara, OR	44.75378/-122.2974
14181750	Rock Creek Near Mill City, OR	44.71207/-122.4276
14182400	Little N Santiam R Blw Canyon Ck, Near Mehama, OR	44.79346/-122.4926
14182500	Little North Santiam River Near Mehama, OR	44.79151/-122.579

Station ID	Station	Latitude/Longitude
14183000	North Santiam River At Mehama, OR	44.78901/-122.6187
14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	44.7079/-122.9729
14187200	South Santiam River Near Foster, OR	44.41235/-122.6887
14187500	South Santiam River At Waterloo, OR	44.49846/-122.8234
14187600	Lebanon Santiam Canal Near Lebanon, OR	44.51485/-122.8648
14188800	Thomas Creek Near Scio, OR	44.71207/-122.7701
14189000	Santiam River At Jefferson, OR	44.71472/-123.0142
14190500	Luckiamute River Near Suver, OR	44.78318/-123.2345
14191000	Willamette River At Salem, OR	44.94429/-123.0429
14197900	Willamette River At Newberg, OR	45.28456/-122.9615
14200000	Molalla River Near Canby, OR	45.24429/-122.6873
14202000	Pudding River At Aurora, OR	45.23318/-122.7501
14207000	Oswego Canal Near Lake Oswego, OR	45.38873/-122.7207
14207500	Tualatin River At West Linn, OR	45.35068/-122.6762
14210000	Clackamas River At Estacada, OR	45.29984/-122.354
14211010	Clackamas River Near ORn City, OR	45.37929/-122.5773
14211315	Tryon Creek Near Lake Oswego, OR	45.43067/-122.6737
14211500	Johnson Creek At Sycamore, OR	45.47746/-122.508
14211550	Johnson Creek At Milwaukie, OR	45.4529/-122.6431
14211720	Willamette River At Portland, OR	45.5175/-122.6692
14211814	Fairview Creek At Glisan St Near Gresham, OR	45.52762/-122.4487
14211818	Buffalo Slough At Ne 33rd Ave, Portland, OR	45.57659/-122.6331
14211820	Columbia Slough At Portland, OR	45.63901/-122.7632
14220500	Lewis River At Ariel, Wa	45.95178/-122.564
14246900	Columbia River At Port Westward, Near Quincy, OR	46.18122/-123.1835

Table 53: Instantaneous flow measurements from DEQ and others in the Willamette River mainstem and major tributaries QAPP project area.

Station ID	Station	Latitude/Longitude	Data Source
USACE BON	Columbia River at Bonneville Outflow		USACE

Table 54: Summary of existing flow data in the Willamette River mainstem and major tributaries QAPP project area. Columns Jan – Dec indicate the number of daily mean flow results in each month.

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14163000	Gate Creek At Vida, OR	31	28	31	30	31	30	31	31	30			
1990	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14207000	Oswego Canal Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1991	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14207000	Oswego Canal Near Lake Oswego, OR	31	28	31	30	31	30	31	31	29			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1991	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1991	14246900	Columbia River At Port Westward, Near Quincy, OR						3	31	31	30	31	30	31
1992	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14187600	Lebanon Santiam Canal Near Lebanon, OR					31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1992	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14211814	Fairview Creek At Glisan St Near Gresham, OR					31	30	31	31	30	31	30	31
1992	14211820	Columbia Slough At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
1992	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31
1993	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14202000	Pudding River At Aurora, OR						10	31	31	30	31	30	31
1993	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	25
1993	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1993	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1994	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14211820	Columbia Slough At Portland, OR	26	28	31	30	31	30	31	31	30	21	30	31
1994	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1994	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1995	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14211820	Columbia Slough At Portland, OR	31	21	31	30	31	30	31	31	30	31	28	16
1995	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1995	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
1996	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14202000	Pudding River At Aurora, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	14211820	Columbia Slough At Portland, OR	31	15	24	30	31	28	31	31	30	31	30	26
1996	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
1996	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31
1997	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30			
1997	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1997	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1997	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14211820	Columbia Slough At Portland, OR	31	28	31	20	23	30	31	31	30	31	26	2
1998	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1998	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14142800	Beaver Creek At Troutdale, OR										31	30	31
1999	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14211820	Columbia Slough At Portland, OR	4	28	31	30	29	30	31	31	30	31	30	31
1999	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
1999	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2000	14142800	Beaver Creek At Troutdale, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR										31	30	31
2000	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14200000	Molalla River Near Canby, OR										31	30	31
2000	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14211820	Columbia Slough At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
2000	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31
2001	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14164700	Cedar Creek At Springfield, OR										31	30	31
2001	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14197900	Willamette River At Newberg, OR										31	30	31
2001	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14211010	Clackamas River Near ORn City, OR						30	31	31	30	31	30	31
2001	14211315	Tryon Creek Near Lake Oswego, OR								31	30	31	30	31
2001	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14211820	Columbia Slough At Portland, OR	31	28	31	30	30	12	11	8	5	12	28	19
2001	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2001	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14188800	Thomas Creek Near Scio, OR										31	30	31
2002	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14202000	Pudding River At Aurora, OR										31	30	31
2002	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14211820	Columbia Slough At Portland, OR	31	28	31	26	21	14	28	22	20	27	30	31
2002	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2002	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	2	28	31	30	31	30	31	31	30	31	30	31
2003	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14211818	Buffalo Slough At Ne 33rd Ave, Portland, OR								24	30	12		
2003	14211820	Columbia Slough At Portland, OR	31	28	31	28	24	30	31	31	30	29	28	31
2003	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2003	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2004	14142800	Beaver Creek At Troutdale, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14164700	Cedar Creek At Springfield, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14188800	Thomas Creek Near Scio, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14197900	Willamette River At Newberg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14200000	Molalla River Near Canby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14202000	Pudding River At Aurora, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211010	Clackamas River Near ORn City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211315	Tryon Creek Near Lake Oswego, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14211818	Buffalo Slough At Ne 33rd Ave, Portland, OR			9	30	31	30	31	31	29			
2004	14211820	Columbia Slough At Portland, OR	28	28	31	30	30	30	31	30	30	31	30	31
2004	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
2004	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31
2005	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14181750	Rock Creek Near Mill City, OR										31	30	31
2005	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR										31	30	31
2005	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14187500	South Santiam River At Waterloo, OR	31	28	31	25						31	30	31
2005	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14211820	Columbia Slough At Portland, OR	27	28	30	30	31	30	28	30	30	31	30	31
2005	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2005	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14159110	Mckenzie River Above South Fork, Near Rainbow, OR	31	28	31	30	31	30	31	31	30			
2006	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14181750	Rock Creek Near Mill City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14187500	South Santiam River At Waterloo, OR	31	28	31	30	12					31	30	31
2006	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	10	21	31
2006	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2006	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR			10	30	31	30	31	31	30	31	30	31
2007	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14181750	Rock Creek Near Mill City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14182400	Little N Santiam R Blw Canyon Ck, Near Mehama, OR									11	31	30	31
2007	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14211820	Columbia Slough At Portland, OR	31	28	31	30	30	25	31	31	30	31	30	31
2007	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2007	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2008	14142800	Beaver Creek At Troutdale, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14164700	Cedar Creek At Springfield, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14181750	Rock Creek Near Mill City, OR	31	29	31	30	31	30	31	31	30	22		
2008	14182400	Little N Santiam R Blw Canyon Ck, Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14188800	Thomas Creek Near Scio, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14197900	Willamette River At Newberg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14200000	Molalla River Near Canby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14202000	Pudding River At Aurora, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211010	Clackamas River Near ORn City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211315	Tryon Creek Near Lake Oswego, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14211820	Columbia Slough At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
2008	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31
2009	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14171600	Willamette River At Corvallis, OR										31	30	31
2009	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2009	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14144805	Flushing Channel At Vancouver Lk At Vancouver, Wa										31	30	31
2010	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	9					
2010	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2010	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14144805	Flushing Channel At Vancouver Lk At Vancouver, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2011	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14165500	Mckenzie River Near Coburg, OR										31	30	31
2011	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211820	Columbia Slough At Portland, OR	25	28	31	30	31	30	31	31	26	29	11	31
2011	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2011	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2012	14142800	Beaver Creek At Troutdale, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14144805	Flushing Channel At Vancouver Lk At Vancouver, Wa	31	29	31	30	31	30	31	31	30	31	13	
2012	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR										31	30	31
2012	14164700	Cedar Creek At Springfield, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14165500	Mckenzie River Near Coburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14171600	Willamette River At Corvallis, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14188800	Thomas Creek Near Scio, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14197900	Willamette River At Newberg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14200000	Molalla River Near Canby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14202000	Pudding River At Aurora, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211010	Clackamas River Near ORn City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211315	Tryon Creek Near Lake Oswego, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211820	Columbia Slough At Portland, OR	31	29	31	30	31	30	31	31	30	31	25	31
2012	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
2012	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31
2013	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14164550	Camp Crk At Camp Crk Rd Bridge, Nr Springfield, OR	31	28	31	30	31	30	31	31	30	20		
2013	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14165500	Mckenzie River Near Coburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211820	Columbia Slough At Portland, OR	29	28	30	30	31	30	30	31	30	31	30	31
2013	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2013	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14165500	Mckenzie River Near Coburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2014	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14165500	Mckenzie River Near Coburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2015	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2016	14142800	Beaver Creek At Troutdale, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14144700	Columbia River At Vancouver, Wa			28	30	31	30	31	31	30	31	30	31
2016	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14164700	Cedar Creek At Springfield, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14165500	Mckenzie River Near Coburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14171600	Willamette River At Corvallis, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	29	31	30	31	30	31	31	30	30	30	31
2016	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	29	31	30	31	30	31	31	30	23	30	31
2016	14188800	Thomas Creek Near Scio, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14197900	Willamette River At Newberg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14200000	Molalla River Near Canby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14202000	Pudding River At Aurora, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211010	Clackamas River Near ORn City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211315	Tryon Creek Near Lake Oswego, OR	31	29	31	30	30	30	31	31	30	31	30	31
2016	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211820	Columbia Slough At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
2016	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31
2017	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14144700	Columbia River At Vancouver, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2017	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14165500	Mckenzie River Near Coburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2017	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14144700	Columbia River At Vancouver, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2018	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14164700	Cedar Creek At Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14165500	Mckenzie River Near Coburg, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14197900	Willamette River At Newberg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14142800	Beaver Creek At Troutdale, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14144700	Columbia River At Vancouver, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2019	14150000	Middle Fork Willamette River Near Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14152000	Middle Fork Willamette River At Jasper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14155500	Row River Near Cottage Grove, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14157500	Coast Fork Willamette River Near Goshen, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14159500	South Fork Mckenzie River Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14162200	Blue River At Blue River, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14162500	Mckenzie River Near Vida, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14163900	Mckenzie River Near Walterville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14164700	Cedar Creek At Springfield, OR	31	28	31	26	31	30	31	31	30	31	30	31
2019	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14165500	Mckenzie River Near Coburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14166000	Willamette River At Harrisburg, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14169000	Long Tom River Near Alvadore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14170000	Long Tom River At Monroe, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14171600	Willamette River At Corvallis, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14174000	Willamette River At Albany, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14181500	North Santiam River At Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14182500	Little North Santiam River Near Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14183000	North Santiam River At Mehama, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14187200	South Santiam River Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14187500	South Santiam River At Waterloo, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14188800	Thomas Creek Near Scio, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14189000	Santiam River At Jefferson, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14190500	Luckiamute River Near Suver, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14191000	Willamette River At Salem, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14197900	Willamette River At Newberg, OR	31	27	31	29	31	30	31	31	30	31	30	31
2019	14200000	Molalla River Near Canby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14202000	Pudding River At Aurora, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14207500	Tualatin River At West Linn, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14210000	Clackamas River At Estacada, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211010	Clackamas River Near ORn City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211315	Tryon Creek Near Lake Oswego, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211500	Johnson Creek At Sycamore, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211550	Johnson Creek At Milwaukie, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211720	Willamette River At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211820	Columbia Slough At Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14220500	Lewis River At Ariel, Wa	31	28	31	30	31	30	31	31	30	31	30	31
2019	14246900	Columbia River At Port Westward, Near Quincy, OR	31	28	31	30	31	30	31	31	30	31	30	31
2020	14142800	Beaver Creek At Troutdale, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14144700	Columbia River At Vancouver, Wa	31	29	31	30	31	30	31	31	30	31	23	
2020	14150000	Middle Fork Willamette River Near Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14151000	Fall Creek Blw Winberry Creek, Near Fall Creek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14152000	Middle Fork Willamette River At Jasper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14153500	Coast Fork Willamette R Blw Cottage Grove Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14155500	Row River Near Cottage Grove, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14157500	Coast Fork Willamette River Near Goshen, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14159200	So Fk Mckenzie River Abv Cougar Lake Nr Rainbow OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14159500	South Fork Mckenzie River Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	14162200	Blue River At Blue River, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14162500	Mckenzie River Near Vida, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14163000	Gate Creek At Vida, OR											5	31
2020	14163150	Mckenzie River Blw Leaburg Dam, Nr Leaburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14163900	Mckenzie River Near Walterville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14164700	Cedar Creek At Springfield, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14164900	Mckenzie River Abv Hayden Br, At Springfield,OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14165500	Mckenzie River Near Coburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14166000	Willamette River At Harrisburg, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14169000	Long Tom River Near Alvadore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14170000	Long Tom River At Monroe, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14171600	Willamette River At Corvallis, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14174000	Willamette River At Albany, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14181500	North Santiam River At Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14182500	Little North Santiam River Near Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14183000	North Santiam River At Mehama, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14184100	North Santiam R At Greens Bridge, Nr Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14187200	South Santiam River Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14187500	South Santiam River At Waterloo, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14187600	Lebanon Santiam Canal Near Lebanon, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14188800	Thomas Creek Near Scio, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14189000	Santiam River At Jefferson, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14190500	Luckiamute River Near Suver, OR	31	29	31	30	31	30	31	31	30	31	30	28
2020	14191000	Willamette River At Salem, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14197900	Willamette River At Newberg, OR	31	29	29	30	31	29	31	31	30	31	29	31
2020	14200000	Molalla River Near Canby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14202000	Pudding River At Aurora, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14207500	Tualatin River At West Linn, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14210000	Clackamas River At Estacada, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	14211010	Clackamas River Near ORn City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211315	Tryon Creek Near Lake Oswego, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211500	Johnson Creek At Sycamore, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211550	Johnson Creek At Milwaukie, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211720	Willamette River At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14211814	Fairview Creek At Glisan St Near Gresham, OR	31	29	31	30	31	30	31	31	29	29	30	31
2020	14211820	Columbia Slough At Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14220500	Lewis River At Ariel, Wa	31	29	31	30	31	30	31	31	30	31	30	31
2020	14246900	Columbia River At Port Westward, Near Quincy, OR	31	29	31	30	31	30	31	31	30	31	30	31

Appendix D Gage height data summary

Table 55: Summary of existing gage height data in the Willamette River Mainstem and Major Tributaries.

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	31
2010	14128870	Columbia River below Bonneville Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14144700	Columbia River at Vancouver, WA	31	28	31	30	31	30	31	31	30	31	30	31
2010	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR				9	31	30	31	31	30	31	30	31
2010	14186200	Middle Santiam River below Green Peter Dam near Foster, OR							30	31	30	31	30	31
2010	14207740	Willamette River above Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14211720	Willamette River at Portland, OR	31	23	31	30	31	30	31	25	30	31	30	31
2010	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31
2011	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	31
2011	14128870	Columbia River below Bonneville Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14144700	Columbia River at Vancouver, WA	31	28	31	30	31	30	31	31	30	31	30	29
2011	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	28	27	30	29	30	31	31	30	31	30	31
2011	14207740	Willamette River above Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14211720	Willamette River at Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31
2012	14128600	Columbia River at Stevenson, WA	31	29	31	30	31	30	31	31	30	31	30	31
2012	14128870	Columbia River below Bonneville Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14144700	Columbia River at Vancouver, WA	31	29	31	30	31	30	31	31	30	28	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	29	31	30	31	30	31	31	30			
2012	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	29	31	30	31	27	31	28	30	28	20	15
2012	14207740	Willamette River above Falls, at Oregon City, OR	31	29	27	30	31	30	31	31	30	31	30	31
2012	14207770	Willamette River below Falls, at Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14211720	Willamette River at Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14220500	Lewis River at Ariel, WA	31	29	28	30	31	30	31	31	30	31	30	31
2013	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	31
2013	14128870	Columbia River below Bonneville Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14144700	Columbia River at Vancouver, WA	31	28	31	30	31	30	31	31	30	31	30	31
2013	14149010	Lookout Point Dam Tailwater Near Lowell, OR										31	30	31
2013	14149510	Dexter Dam Tailwater at Dexter, OR										31	30	31
2013	14159410	Cougar Dam Tailwater Near Rainbow, OR									13	31	30	31
2013	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR										31	30	29
2013	14180510	Detroit Dam Tailwater Near Detroit, OR										31	30	31
2013	14181410	Big Cliff Dam Tailwater Near Niagara, OR										31	30	31
2013	14186110	Green Peter Dam Tailwater Near Foster, OR										31	30	31
2013	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	29	28	29	27	30	29	30	25	30	31	30	31
2013	14186610	Foster Dam Tailwater at Foster, OR										31	30	31
2013	14207740	Willamette River above Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14211720	Willamette River at Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31
2014	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	31
2014	14128870	Columbia River below Bonneville Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14144700	Columbia River at Vancouver, WA	31	28	31	30	31	30	31	31	30	31	30	31
2014	14149010	Lookout Point Dam Tailwater Near Lowell, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	14149510	Dexter Dam Tailwater at Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14159410	Cougar Dam Tailwater Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14180510	Detroit Dam Tailwater Near Detroit, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14181410	Big Cliff Dam Tailwater Near Niagara, OR	31	28	31	30	31	28	28	31	30	31	30	31
2014	14186110	Green Peter Dam Tailwater Near Foster, OR	31	28	31	28	31	30	31	31	30	31	30	31
2014	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14186610	Foster Dam Tailwater at Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14207740	Willamette River above Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14211720	Willamette River at Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31
2015	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	31
2015	14128870	Columbia River below Bonneville Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14144700	Columbia River at Vancouver, WA	31	28	31	30	31	30	31	31	30	31	30	31
2015	14149010	Lookout Point Dam Tailwater Near Lowell, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14149510	Dexter Dam Tailwater at Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14159410	Cougar Dam Tailwater Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	29	28	31	30	31	30	31	31	30	31	30	31
2015	14180510	Detroit Dam Tailwater Near Detroit, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14181410	Big Cliff Dam Tailwater Near Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14186110	Green Peter Dam Tailwater Near Foster, OR	31	27	31	30	31	30	31	31	30	31	30	31
2015	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14186610	Foster Dam Tailwater at Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14207740	Willamette River above Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14211720	Willamette River at Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31
2016	14128600	Columbia River at Stevenson, WA	31	29	31	30	31	30	31	31	30	31	30	31
2016	14128870	Columbia River below Bonneville Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14128895	Hamilton Creek Near Mouth, at N Bonneville, WA										24	30	31
2016	14144700	Columbia River at Vancouver, WA	31	29	31	30	31	28	31	31	30	31	30	31
2016	14149010	Lookout Point Dam Tailwater Near Lowell, OR	31	29	31	30	31	30	31	31	28	31	30	31
2016	14149510	Dexter Dam Tailwater at Dexter, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14158050	Willamette River at Eugene, OR									1	26	30	31
2016	14159410	Cougar Dam Tailwater Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14180510	Detroit Dam Tailwater Near Detroit, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14181410	Big Cliff Dam Tailwater Near Niagara, OR	31	24	30	30	31	30	31	31	30	31	30	31
2016	14186110	Green Peter Dam Tailwater Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14186610	Foster Dam Tailwater at Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14207740	Willamette River above Falls, at Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14207770	Willamette River below Falls, at Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14211720	Willamette River at Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14220500	Lewis River at Ariel, WA	31	29	31	30	31	30	31	31	30	31	30	31
2017	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	31
2017	14128870	Columbia River below Bonneville Dam, OR	31	28	31	30	31	28	23	30	30	31	30	31
2017	14128895	Hamilton Creek Near Mouth, at N Bonneville, WA	31	28	31	30	31	30	31	6		18	30	31
2017	14144700	Columbia River at Vancouver, WA	31	28	21	30	30	30	31	31	30	31	30	31
2017	14149010	Lookout Point Dam Tailwater Near Lowell, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14149510	Dexter Dam Tailwater at Dexter, OR	31	28	31	30	31	29	31	31	30	31	30	31
2017	14158050	Willamette River at Eugene, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14159110	Mckenzie River above South Fork, Near Rainbow, OR									1	31	29	28
2017	14159410	Cougar Dam Tailwater Near Rainbow, OR	28	28	31	30	28	30	31	31	30	31	30	31
2017	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14180510	Detroit Dam Tailwater Near Detroit, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14181410	Big Cliff Dam Tailwater Near Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14186110	Green Peter Dam Tailwater Near Foster, OR	31	28	31	30	29	30	31	31	30	31	30	31
2017	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14186610	Foster Dam Tailwater at Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14207740	Willamette River above Falls, at Oregon City, OR	31	28	31	30	31	24	31	31	30	31	30	31
2017	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14211720	Willamette River at Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31
2018	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	31
2018	14128870	Columbia River below Bonneville Dam, OR	31	28	27	28	31	30	31	31	30	31	30	31
2018	14128895	Hamilton Creek Near Mouth, at N Bonneville, WA	31	28	31	30	31	30	14			2	30	31
2018	14144700	Columbia River at Vancouver, WA	31	28	31	30	31	30	31	31	30	31	30	31
2018	14149010	Lookout Point Dam Tailwater Near Lowell, OR	27	22	31	30	31	30	31	31	30	31	30	31
2018	14149510	Dexter Dam Tailwater at Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14158050	Willamette River at Eugene, OR	31	28	31	30	31	30	31	28	28	31	30	31
2018	14159110	Mckenzie River above South Fork, Near Rainbow, OR	31	28	27	30	31	30	31	31	30	31	30	31
2018	14159410	Cougar Dam Tailwater Near Rainbow, OR	31	28	31	27	31	30	31	31	30	31	30	31
2018	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14180510	Detroit Dam Tailwater Near Detroit, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14181410	Big Cliff Dam Tailwater Near Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14186110	Green Peter Dam Tailwater Near Foster, OR	31	28	31	30	31	30	30	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	27	30	28	31	30	31	31	26	31	30	31
2018	14186610	Foster Dam Tailwater at Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14207740	Willamette River above Falls, at Oregon City, OR	31	28	30	30	26	30	31	31	30	31	30	31
2018	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14211720	Willamette River at Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31
2018	444650123134500	Luckiamute River Near Parker, OR												14
2019	14128600	Columbia River at Stevenson, WA	31	28	31	30	31	30	31	31	30	31	30	30
2019	14128870	Columbia River below Bonneville Dam, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14128895	Hamilton Creek Near Mouth, at N Bonneville, WA	31	28	31	30	31	30	10		9	31	30	31
2019	14144700	Columbia River at Vancouver, WA	31	28	31	30	31	30	31	31	30	31	30	30
2019	14149010	Lookout Point Dam Tailwater Near Lowell, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14149510	Dexter Dam Tailwater at Dexter, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14158050	Willamette River at Eugene, OR	31	28	31	30	30	30	31	31	30	31	30	31
2019	14159110	Mckenzie River above South Fork, Near Rainbow, OR	31	28	30	30	31	30	31	31	30	31	30	31
2019	14159410	Cougar Dam Tailwater Near Rainbow, OR	31	28	31	30	31	30	31	31	30	31	30	28
2019	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14180510	Detroit Dam Tailwater Near Detroit, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14181410	Big Cliff Dam Tailwater Near Niagara, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14186110	Green Peter Dam Tailwater Near Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	28	30	30	31	30	31	31	30	31	30	31
2019	14186610	Foster Dam Tailwater at Foster, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14207740	Willamette River above Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14207770	Willamette River below Falls, at Oregon City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14211720	Willamette River at Portland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14220500	Lewis River at Ariel, WA	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	444650123134500	Luckiamute River Near Parker, OR	30	28	29	30	31	30	31	31	30	31	30	30
2020	14128600	Columbia River at Stevenson, WA	31	29	31	30	31	30	31	31	30	31	30	31
2020	14128870	Columbia River below Bonneville Dam, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14128895	Hamilton Creek Near Mouth, at N Bonneville, WA	31	29	31	30	31	30	31	13	3	23	30	31
2020	14144700	Columbia River at Vancouver, WA	31	29	31	30	31	30	31	31	30	31	30	31
2020	14149010	Lookout Point Dam Tailwater Near Lowell, OR	31	29	31	30	31	21	31	31	30	31	30	31
2020	14149510	Dexter Dam Tailwater at Dexter, OR	31	29	31	28	31	29	30	31	30	31	30	31
2020	14158050	Willamette River at Eugene, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14159110	Mckenzie River above South Fork, Near Rainbow, OR	30	29	31	28	31	30	31	31	19	31	30	31
2020	14159410	Cougar Dam Tailwater Near Rainbow, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14164550	Camp Creek at Camp Creek Rd Bridge, near Springfield, OR	31	29	31	30	31	30	31	27	29	31	30	30
2020	14180510	Detroit Dam Tailwater Near Detroit, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14181410	Big Cliff Dam Tailwater Near Niagara, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14186110	Green Peter Dam Tailwater Near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14186200	Middle Santiam River below Green Peter Dam near Foster, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14186610	Foster Dam Tailwater at Foster, OR	31	29	31	30	31	30	31	29	29	31	2	
2020	14207740	Willamette River above Falls, at Oregon City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14207770	Willamette River below Falls, at Oregon City, OR	31	29	31	18	31	30	31	31	30	31	30	31
2020	14211720	Willamette River at Portland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14220500	Lewis River at Ariel, WA	31	29	31	30	31	30	31	31	30	31	30	31
2020	444650123134500	Luckiamute River Near Parker, OR	31	28	31	30	31	30	31	31	30	31	30	31

Appendix E HTML map

DEQ prepared an interactive HTML map to display relevant information described in this QAPP. The map will be posted to DEQ's website alongside this QAPP and saved in same location as the QAPP in DEQ's files. The interactive map contains the following layers and location information:

1. OpenStreetMap base map.
2. USGS hydro cache base map that represents hydrologic information of the National Hydrography Dataset (NHD).
3. 2017 and 2018 one foot Oregon Statewide Imagery Program (OSIP) aerial imagery.
4. TMDL project area boundary.
5. Available continuous stream temperature monitoring locations, organizations that collected that data, and the count of days per month for each year when temperature data are available.
6. Available stream flow monitoring locations, organizations that collected that data, and the count of days per month for each year when flow data are available.
7. The location of meteorological monitoring locations and the source of the data.
8. The location of active individual NPDES permitted facilities, the permit type, and DEQ file number.
9. The locations of current registrants covered under the general NPDES GEN01, GEN03, GEN04, GEN05, GEN19, or GEN40 (MS4) permits.
10. The extent of existing calibrated models described in this QAPP.
11. The extent of newly proposed calibrated models described in this QAPP.
12. The location of temperature calibration sites.
13. The location of temperature monitoring used for model boundary conditions and tributary inputs.
14. The location of flow monitoring locations used for model boundary conditions and tributary inputs.
15. Eight-digit hydrologic unit boundaries (HUC8 Subbasins).
16. Ten-digit hydrologic unit boundaries (HUC10 Watersheds).
17. Twelve-digit hydrologic unit boundaries (HUC12 Subwatersheds).
18. 2018/2020 303(d) Integrated Report status that are classified as water quality limited Category 5 and/or Category 4A for temperature.
19. Fish use designations depicted in OAR 340-041-0340 Figure 340A.

20. Salmon and Steelhead spawning use extent and period depicted in OAR 340-041-0340 Figure 340B.