PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

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December 19, 2013 WQ 0.10.12

Carrie Gentry
Oregon Health Authority
Drinking Water Services
PO Box 14450
Portland, OR 97293-0450

Subject: Annual Watershed Control Program Report for Water Year 2013

Dear Carrie:

As required by the Surface Water Treatment Rule and Section 333-61-0032 (2)(c)(B) of the Oregon Administrative Rule, the Portland Water Bureau herewith submits its Water Year 2013 Watershed Control Program Report for the Bull Run water supply system. The watershed control program for the Bull Run system continues to be an effective barrier for minimizing the potential for microbial contamination.

The OHA watershed and disinfection system survey for Water Year 2013 was conducted on August 20, 2013. OHA sent a draft of its annual on-site watershed control program inspection report on October 25, 2013.

Please note that the first annual Bull Run Treatment Variance Watershed Report for Water Year 2013, required per OHA's 2012 *Cryptosporidium* treatment variance Final Order, is being submitted separately.

If you have any questions about the enclosed report, please feel free to contact me at (503) 823-7648.

Sincerely,

Yone Akagi, P.E.
Water Quality Compliance Manager

Enclosure

Cc: Edward Campbell
Ann Richter
Chris Wanner
Jessica Letteney

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Portland Water Bureau

Annual Watershed Control Program Report for Water Year 2013

December 2013

Submitted to Oregon Health Authority

Public Health Division Drinking Water Services

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Annual Watershed Control Program Report for Water Year 2013

1. Introduction

For unfiltered water systems, the federal Surface Water Treatment Rule and the Oregon Administrative Rules (OARs) require annual reporting of the control programs in place for these systems' watersheds "identifying any special concerns about the watershed, the procedures used to resolve the concern, current activities affecting water quality, and projections of future adverse impacts or activities and the means to address them" [OAR 333-061-0032 (2)(c)(B)]. This Annual Watershed Control Program Report for Water Year 2013 is submitted to the Oregon Health Authority (OHA) in fulfillment of requirements for unfiltered systems. Water Year 2013 started on October 1, 2012, and ended on September 30, 2013.

This report covers the Bull Run water supply drainage, referred to hereafter as the Bull Run watershed. The Bull Run watershed encompasses 102 square miles of land upstream of the intake for the Portland Water Bureau (PWB) drinking water supply and is within the Bull Run Watershed Management Unit (BRWMU). The BRWMU is the legal boundary defined by federal law (Public Law 95-200 and amended by the Oregon Resources Conservation Act of 1996 and the Little Sandy Act of 2001) for 147 square miles of land (see Figure 1). An additional 1.3 square miles of City-owned land, closed by a 2010 City of Portland Code amendment, adds to the protected area and forms what is known as the Bull Run Watershed Closure Area.

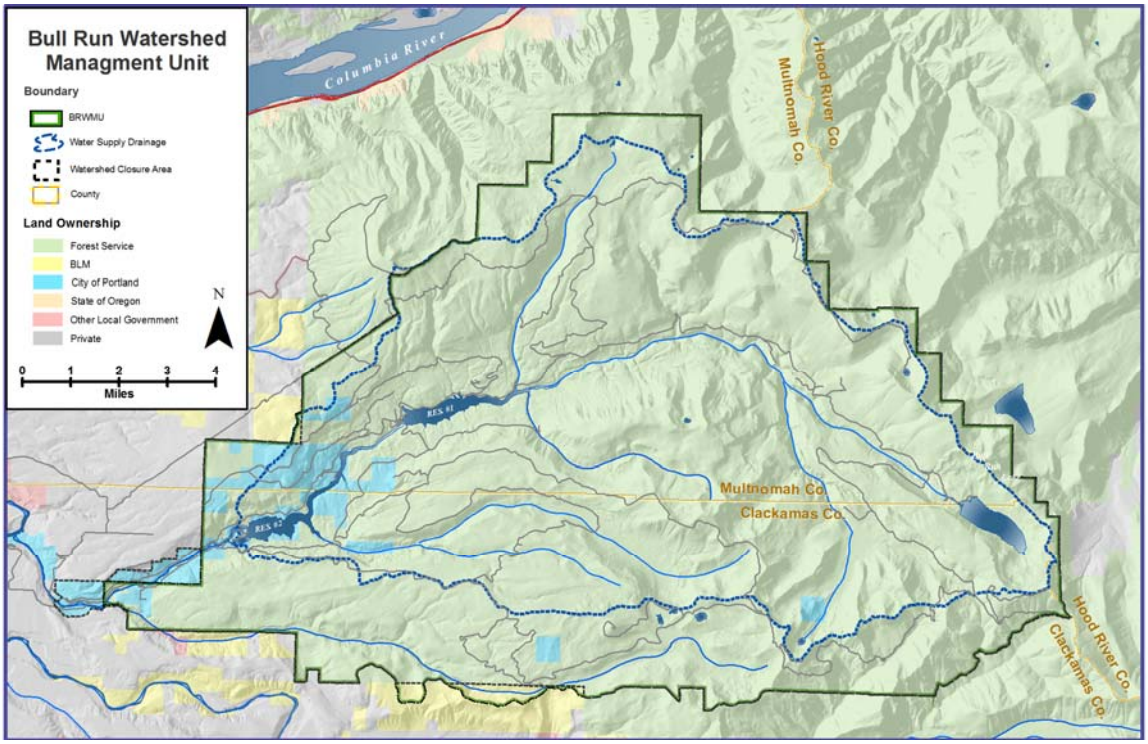

Figure 1. Bull Run Water Supply Drainage Within the Bull Run Watershed Management Unit and Closure Area Boundaries

A separate report, the Bull Run Treatment Variance Watershed Report for Water Year 2013, describes inspections and monitoring conducted in the Bull Run watershed in fulfillment of conditions in OHA's Final Order in the Matter of Portland Water Bureau's Request for Variance Under 42 USC § 300g-4(a)(1)(B). The Final Order provides PWB with a method of alternative compliance to the Environmental Protection Agency's (EPA) Long Term 2 Enhanced Surface Water Treatment Rule. The variance report documents the results of field inspections and environmental monitoring conducted during each water year.[1]

2. Land Ownership and Management

About 95 percent of the BRWMU is federal land administered by the U.S. Forest Service (Forest Service); 4 percent is owned by the City of Portland; and 1 percent is federal land administered by the U.S. Bureau of Land Management (BLM). The land in the Bull Run watershed is protected through a variety of federal, state, and local legal controls, listed below.[2]

Federal Controls

- Bull Run Management Act (PL 95-200 (1977), as amended by PL 104-208 (1996) and PL 107-30 (2001); 16 U.S. Code, Section 482b Notes)
- 1990 Mt. Hood National Forest Land and Resource Management Plan (pages 4-295 through 4-317)
- 1994 Northwest Forest Plan
- 1995 Bureau of Land Management, Salem District, Record of Decision and Resource Management Plan
- 2012 Mt. Hood National Forest Closure Order for the Bull Run Watershed Management Unit—Closure Order MH-2012-05 [pursuant to 36 Code of Federal Regulations (CFR) 261.50(a) and (b), 36 CFR 261.52(a), 36 CFR 261.53(e), 36 CFR 261.54(e), and 36 CFR 261.55(a)]
- 2011 BLM Permanent Closure Order for the Bull Run Watershed Management Unit (pursuant to 43 U.S.C. 1733(a), 43 CFR 8360.0-7, and 43 CFR 8364.1)
- 2007 Bull Run Watershed Management Unit Agreement between the U.S. Department of Agriculture (USDA) Forest Service, Mt. Hood National Forest and the City of Portland

[1] The Bull Run Treatment Variance Watershed Report is available on the Portland Water Bureau website at www.portlandoregon.gov/water/treatmentvariance.

[2] Electronic copies of these documents are available on PWB's LT2 website under OHA Request for Additional Information, Question 2, Attachments 2-1 through 2-21: www.portlandoregon.gov/water/54913.

State Controls

- Oregon Revised Statute (ORS) 448.295 to ORS 448.325
- State of Oregon Department of Forestry Regulated Closure Proclamations (for the Bull Run Regulated Use Area during fire season, pursuant to ORS 477.35 to 477.550)
- Bull Run Treatment Variance Final Order, March 14, 2012

Local Controls

- Portland City Code Chapter 21.36, Bull Run Watershed Protection
- Section 00203, Bull Run Watershed Closure Area, of Portland Water Bureau contract specifications for construction projects in the Bull Run Watershed Closure Area
- Section 00202, Security, of Portland Water Bureau contract specifications for construction projects[3]

PWB and the Forest Service plan to pursue a land exchange that involves approximately 5,400 acres. The land exchange will allow PWB to acquire ownership of the federal land associated with the reservoirs, conduit rights-of-way, and the main arterial roads to Headworks and the reservoirs. The two agencies signed a formal agreement, referred to as the Agreement to Initiate (ATI), in February 2010. The ATI outlined the estimated costs, agency responsibilities, and schedule for the land exchange project. The ATI is a non-binding agreement whereby the parties agree to further evaluate the exchange through steps such as appraisals and completion of an environmental assessment. The exchange is currently expected to be completed in 2015.

In April 2009, PWB implemented a standard operating protocol to prevent the introduction and establishment of aquatic invasive and nuisance animals, plants, and diseases. The bureau's Bull Run Watershed and Sandy River Basin Aquatic Invasive and Nuisance Species Standard Operating Protocol, effective in May of 2009, was revised March 7, 2012. The Invasive Plant Standard Operating Protocol for the Bull Run Watershed Management Unit was approved August 23, 2013. A wheel-washing station for vehicles, located at the Bull Run main gate, became operational in the spring of 2013. The protocols and procedures of the Invasive Species Program are intended to reduce the risks to water quality from invasive species in the watershed.

3. Security and Trespass

Security measures and trespass restrictions are in place to protect the ecological features that make the Bull Run a source of high-quality water. PWB Security Rangers monitor all watershed ingress and egress. PWB Security and Forest Service law enforcement

[3] Available at www.portlandoregon.gov/water/47998.

officers patrol the watershed regularly. PWB controls watershed access through policies that limit entry privileges to approved staff and contractors, procedures that control keys, and surveillance at the main watershed gate including a camera and electronic programmable CyberKey entry. The limited-entry policy[4] includes a requirement for entry permits. Law enforcement and emergency response personnel are allowed to enter the BRWMU when necessary to perform their duties. Domesticated animals are expressly prohibited from entering the BRWMU. The Forest Service has similar policies and practices limiting access.

Forest Service lands in the BRWMU are closed through a combination of policy in the Bull Run Management Act (PL 95-200, as amended in 1996 and 2001) and an administrative closure order that was most recently updated by the Mt. Hood Forest Supervisor in October 2012. In the mid-2000s, PWB approached BLM to request an administrative closure of BLM-managed land within the BRWMU. In 2008, BLM issued a temporary closure order on its land, including approximately 60 acres inside the water supply drainage. BLM published a notice in the Federal Register in September 2011 that announced its intent to issue a permanent closure order for its land within the BRWMU. BLM's permanent closure order took effect December 2, 2011.

In February 2010, the Portland City Council approved adoption of new City code (Chapter 21.36) that prohibits entry into Forest Service lands within the BRWMU and City of Portland-owned lands to the west of the unit. The new code provides the City with additional enforcement capabilities to deal with trespassers. This code is in addition to the Forest Service closure regulations.

In accordance with Public Law (PL) 107-188, the Public Health Security and Bio-terrorism Preparedness and Response Act of 2002, the bureau completed a Security Vulnerability Assessment, required by Congress for all water systems serving populations of over 100,000 people. The assessment included a review of the watershed from a security perspective. In 2010, Water Bureau facilities inside the BRWMU were assessed by a special team from the U.S. Department of Homeland Security. This team proposed no new recommendations for protection of the management unit as a whole.

In 2011, PWB and the Forest Service took several actions to reduce the risk of trespass in the portion of the BRWMU along Lolo Pass Road. PWB installed road signs along Lolo Pass Road that alerted motorists that the area west of the road was within the BRWMU and closed to public entry. Lockable steel barriers were installed on all spur roads used by the Bonneville Power Administration (BPA) right-of-way and transmission line maintenance crews. The Forest Service completed the decommissioning of Road 1800210 and blocked an access to an area that had been the site of illegal dumping and campfires.

[4] Portland Water Bureau. Bull Run Watershed Security Access Policies and Procedures (S.02), Final Revision. 2012. Portland Oregon.

The security and access measures implemented by PWB and the Forest Service support the legal direction to manage the watershed in a way that protects the ecological features of the water source. PWB and the Forest Service coordinate access policies and security efforts. A list of specific access, entry, and security control measures follows.

Access and Entry

- All roads leading into the Bull Run watershed are gated.
- Five of the seven access routes into the Bull Run have at least two gates (an outer gate and an inner, secondary gate).
- The main watershed gate is opened by electronic programmable CyberKey that records the badge number, time, and date of entry every time the gate is opened.
- Access cards, CyberKeys, or physical keys are issued through a security control process and only to agencies (and contractors) with a demonstrated need for watershed access.
- In addition to the access controls, PWB and the Forest Service issue vehicle permits to contractors to authorize the use of contractors' vehicles in the Bull Run.
- Most PWB contractors receive an electronic programmable CyberKey for the automated main gate only. The electronic CyberKeys can be disabled after the authorized use period expires.
- Keys to conventional padlocks that are used on gates other than the main gate are generally not issued to contractors.
- All authorized public access to the watershed is through public tours or escorted access by PWB or Forest Service staff.

Security

- In 2006, PWB acquired a private property at the main gate and converted the dwelling into an office and residence for the ranger who conducts security patrols for trespassers in the Bull Run watershed.
- The main gate entrance has a surveillance camera that is monitored by PWB's security staff.
- Security staff have access to all electronic CyberKey transaction data
- Each year, PWB hires two additional seasonal rangers to patrol the watershed from May until October.
- PWB Rangers conduct patrols to check for evidence of trespass and confirm the condition of boundary signage.
- Security patrols are also provided by the Forest Service law enforcement officer assigned to Zigzag Ranger District of the Mt. Hood National Forest. The Multnomah

and Clackamas County Sheriff's Offices are available to assist with incidents as well.

- PWB monitors surveillance cameras on Dam 1 and Dam 2—the live video feed is monitored by Headworks operators who staff the facility 24 hours a day, 7 days a week, 365 days a year. PWB's Security Dispatch Center and Water Control Center staff also have the capacity to monitor the video.
- Motion-activated cameras provide surveillance at several undisclosed locations. PWB Security staff collect digital image files from these cameras as part of regular surveillance and patrols.
- The only recreational trail access in the BRWMU is a 8.3-mile segment of the Pacific Crest Trail (PCT), the Huckleberry Trail (which accesses the PCT from Lost Lake at the easternmost reach of the BRWMU, 15 miles from the water supply intake), and a 1.0-mile segment of the Oneonta Creek trail in the Larch Mountain area. Except for a 1.2-mile segment, the full length of the PCT and secondary access trail are located outside the Bull Run water supply drainage. The 8.3-mile segment of the PCT within the BRWMU is well-signed with Bull Run "No Trespassing" signs instructing hikers not to trespass on the drainage side of the trail. Access into the Bull Run water supply drainage from the PCT is difficult because of the steep terrain and dense underbrush. During Water Year 2013, PWB Rangers conducted a total of six patrols: two on the Pacific Crest Trail to the east, two on the Oneonta trail to the north, and two on the BLM Sandy Ridge bike trails to the south.

Human Incursion

PWB rangers reported a total of 13 trespass incidents for Water Year 2013. Of the 13 trespass incidents, 2 were inside the water supply drainage boundary. Based on the evaluation of the circumstances around the trespass events, there were no concerns for contamination that required further investigation.

Domesticated Animal Incursion

PWB Rangers reported two incidents of domesticated animal incursion. Both incidents occurred in June 2013.

On June 18, 2013, PWB staff reported observing a domesticated dog on Road 10 between Dams 1 and 2. Security Rangers conducted an area check and inspected for canine feces. Neither dog nor feces were found. Through local "Missing Dog" listings, the PWB contacted the owner who confirmed that the dog observed was his and had since returned.

On June 29, 2013, a herd of five domesticated bison were observed on the western edge of the Bull Run Watershed Closure Area and reported to PWB Rangers. The Rangers contacted the farm from which the bison escaped. The bison were herded out of the closure area and towards the farm. Later that evening, PWB staff reported seeing the

bison in the closure area again. The owner confirmed that the bison were not successfully herded back to the farm before nightfall and had been left to bed outside the closure area. Rangers resumed area checks for the bison on June 30 and July 1. The bison were located on July 1 and successfully herded back to their pen at the farm.

During the incident, the bison had been observed just inside the water supply drainage on Forest Road 10. On July 2, PWB staff collected two bison scat samples to test for *Cryptosporidium*. Both samples indicated 0 oocysts of *Cryptosporidium* detected.

4. Wildlife

The potential sources of microbial contamination are mammalian species common to the Bull Run (such as beaver, black bear, and rodents) and Canada geese. As part of the Bull Run Treatment Variance, the Portland Water Bureau monitors wildlife in the watershed. The monitoring includes the following:

- Scat sampling to test for the presence of *Cryptosporidium* and *Giardia*
- Wildlife inspections of areas that are in proximity to the water intakes structures and other areas where there is habitat favorable to the listed wildlife species.

PWB has initiated wildlife studies to better understand the risk of microbial contamination posed by wildlife, particularly with regards to *Cryptosporidium*. The Bull Run Treatment Variance Annual Report contains detailed information on the scat monitoring and wildlife inspection programs as well as the wildlife studies initiated during Water Year 2013.

5. Weather, Turbidity, and Erosion

Water Year 2013 was, overall, wetter than average in the Bull Run watershed. A total of 91.5 inches of precipitation was recorded at Headworks during the water year. The long-term average annual precipitation for this location is slightly less than 80 inches. A comparison of monthly total precipitation levels at Headworks is shown in Figure 2. The months of October 2012 and September 2013 were considerably above the historical median; November–January and April and May were above their respective medians; February, March, and June–August were below the historical median.

Figure 3 shows mean daily flows at the Bull Run main stem key station, located upstream of Reservoir 1. A flow of 5,000 cubic feet per second (cfs) at this station typically heightens the concern that a turbidity event that approaches or exceeds 5 nephelometric turbidity units (NTU) may occur.[5] The maximum mean daily flow recorded at this site during Water Year 2013 was 2,690 cfs on October 29, 2012, and was not associated with a turbidity event.

[5] The source-water criteria for unfiltered systems include maintaining turbidity levels at less than 5 nephelometric turbidity units (NTU) for finished drinking water.

A landslide on the South Fork Bull Run tributary to Reservoir 2 occurred in January 2012, in the previous water year. The landslide caused two turbidity spikes at the raw water intake resulting in one shutdown in January 2012 and reducing conduit flows in February 2012. The landslide was inspected twice from the air in Water Year 2013—once in November 2012 and once in July 2013. Both inspections showed that there were no signs of further large-scale sediment movement toward the stream.

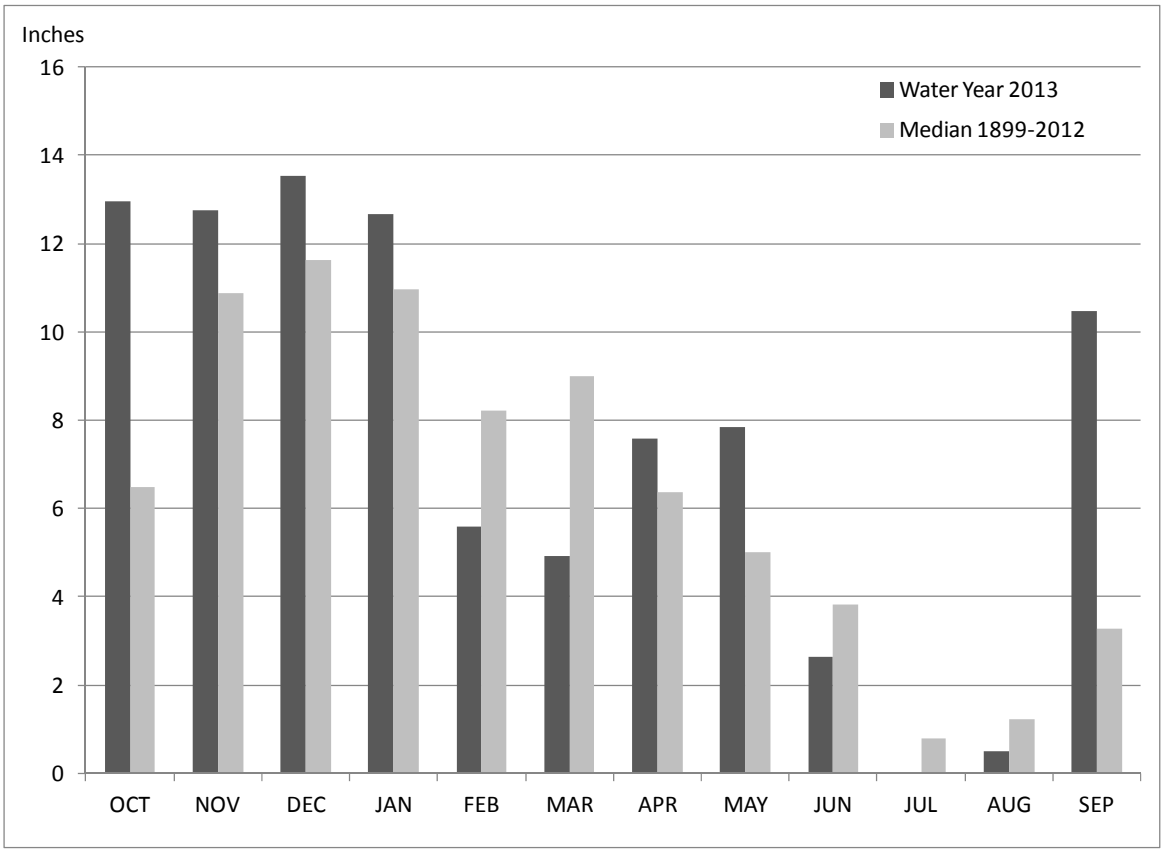

Figure 2. Monthly Precipitation at Headworks, Bull Run, Oregon, Median and Water Year 2013 Results

During Water Year 2013, the bureau used online turbidimeters (HF Scientific Microtol 3 process) at each raw water intake location for compliance with the Surface Water Treatment Rule. One pair of these turbidimeters was used at each raw water intake location—the Primary Intake Structure and Screenhouse 3. One unit in each pair of online turbidimeters was set up to read turbidity in the range of 0–6 NTU; the second unit was set up for turbidities in the range of 0–25 NTU (Screenhouse 3) or 0–20 NTU (Primary Intake Structure). Bureau staff calibrated these turbidimeters monthly with ProCal® (a styrene divinylbenzene co-polymer) and verified them twice weekly using the high and low secondary standards. In addition, a laboratory bench-top turbidimeter was used for routine measurement of grab samples. In Water Year 2013, two such

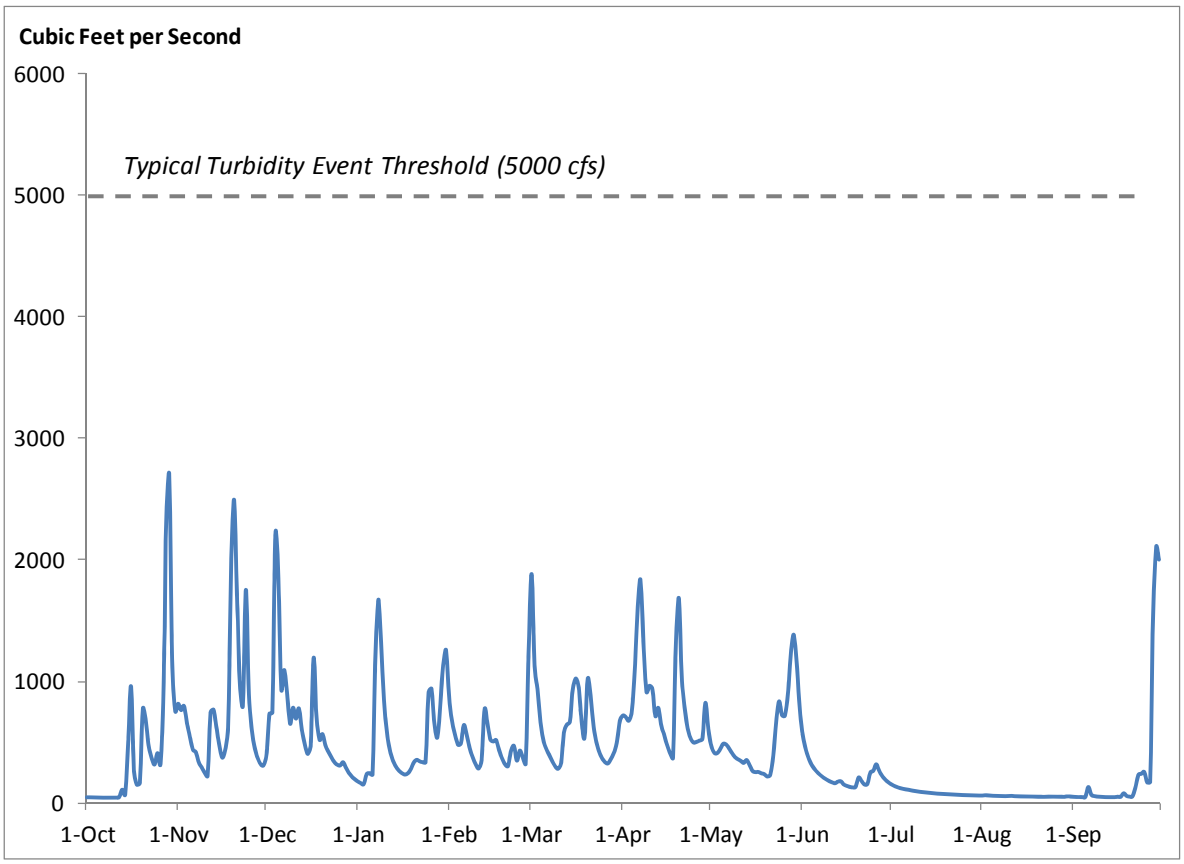

Figure 3. Stream Flow in the Main Stem Bull Run River Measured at Key Station 18 above Reservoir 1, Water Year 2013

bench-top meters were used. To start the Water Year, the bureau utilized a Hach 2100N. On March 28, 2013, the Hach unit was replaced with an HF Scientific Micro 1000 turbidimeter in order to use the same technology as the online turbidimeters.

6. Fire Protection

Fire-protection responsibilities for the Bull Run are shared among the Forest Service, the Oregon Department of Forestry (ODF), and PWB. In July 2006, staff from the Forest Service, ODF, and PWB coordinated to prepare an update to the Bull Run Fire Management Plan. The plan identifies fire-suppression resources available to respond to fires in the Bull Run, defines policies on the use of aerial resources, and defines the roles and responsibilities of the three agencies.

The Forest Service's Closure Order for the BRWMU was updated in October 2012 to prohibit hikers from building and using a fire, campfire, or fire stove (except for a pressurized liquid or gas stove) on trails located within the unit.

Although no wildland fires occurred in the BRWMU during Water Year 2013 and no significant fires burned in areas bordering the watershed, an isolated equipment fire occurred because of a vehicle malfunction. The equipment fire was immediately contained and is described in more detail in the Hazardous Materials Spills section, Table 2, which begins on page 17.

Fire Suppression Resources

The Forest Service has the primary responsibility for initial attack on Forest Service lands and ODF has primary responsibility for initial attack on City and BLM land. However, those two parties operate under the "closest forces" incident command policy, whereby the agency that arrives at the fire earliest assumes the role of incident commander until authority is transferred to the primary agency.

The Sandy Fire Department has responsibility for protection of structures in the Bull Run watershed because the wildland fire protection agencies are not trained to participate in extinguishing structure fires. Portland Fire & Rescue plays a secondary role and would respond to a structure fire or vehicle fire in the watershed if the Sandy Fire Department deemed that it needed additional resources.

PWB crews and contractors comply with the Industrial Fire Precaution Level guidelines on projects and maintenance activities that involve use of heavy equipment, power saws, and other spark-emitting equipment during fire season. PWB provides funding to the Forest Service to staff a fire lookout on Hickman Butte, located on the southern boundary of the Bull Run watershed, from early July through mid-to-late September. Aerial surveillance of the watershed from fixed-wing aircraft is routinely conducted after lightning storms.

7. Project Planning and Construction

Road Maintenance

In December 2007, the Portland Water Bureau (PWB) and the U.S. Forest Service signed the 20-year interagency Bull Run Watershed Management Unit Agreement. The agreement identifies the roles and responsibilities for the two agencies and formally assigns responsibility for roads maintenance to PWB. PWB has assumed responsibility for the maintenance of nearly all roads in the Bull Run necessary for long-term access. Routine maintenance includes activities such as trimming vegetation and cleaning ditches and culverts. The technical details of the roads maintenance program are described in the 2009 Bull Run Transportation System Maintenance Plan.

No major road repair projects were completed in the water-supply drainage during Water Year 2013. During the summer of 2013, the Water Bureau finalized a condition assessment of all the large culverts (those greater than or equal to 36 inches in diameter)

in the road network and began the condition assessment for culverts smaller than 36 inches in diameter.

Two large road-repair projects are anticipated to begin in the summer of 2014. Segments of the primary access and primary backup roads to Headworks and Dam 2 will be resurfaced. One project will include three miles of paving; the second project will include widening and wall-building. The bureau's erosion-control, invasive species, and portable sanitation requirements are part of PWB's standard contract language. Bureau inspectors will check for conformance to these requirements as part of standard construction project inspections.

Dam 2 Tower Project

The Dam 2 Tower Improvements Project modifies the north tower inlet to allow selective-depth withdrawal from Bull Run Reservoir 2. The intent is to help regulate temperatures for flows released to the lower Bull Run River for the benefit of anadromous fish species and to improve water quality by providing flexibility during turbidity events. A Construction Manager/General Contractor completed the final design in the spring of 2012. As of October 1, 2013, the project was approximately 80 percent complete.

As part of the project, dredging was required around the base of the tower. A silt curtain was placed around the tower to contain turbid water caused by the dredging process. During Water Year 2012 a portion of the sediment removed by dredging at the base of the tower was found to be contaminated with oil and diesel. Subsequent water sampling indicated that all results were below the Method Reporting Limit (MRL) for the contaminants sampled. The Annual Watershed Control Program Report for Water Year 2012 provides a detailed description of the sampling results.

In September 2013, the Dam 2 Towers project contractor placed a geotextile membrane over the area from which contaminated soils were dredged. This was placed to underlie a thick layer of large rock and concrete revetment mats. Although no indications of further contamination were found (no sheen rose to the surface of the water and no sheen was observed in other dredging spoils), the geotextile was placed as a conservative measure to cap the area in the event that any contamination remained in the soil.

During Water Year 2013, there were a few incidents of small amounts of oil and diesel leaking into the water in the contained area around the construction site. Table 1 lists the leak events, indicates whether sampling was conducted, and indicates whether sampling results are below the MRL.

Table 1. Contaminant Leaks During Dam 2 Tower Construction Project

Date	Description	Sampling	Below MRL[a]
November 10, 2012	Hydraulic oil leaked from a concrete truck located on the work dock. The leak was within a spill containment boom already in place. Samples were collected inside the containment boom, outside the boom, and at the raw water intake. Contractors cleaned all of the resulting sheen quickly after the spill.	Raw water sampling for diesel and oil	Yes
February 28, 2013	A hydraulic fitting separated and food-grade hydraulic fluid spilled onto the barge deck. Although contractors cleaned up the fluid before it reached the water, PWB collected samples inside the containment boom, outside the boom, and at the raw water intake.	Raw water sampling for diesel and oil	Yes
March 5, 2013	A hydraulic fitting came loose underwater, resulting in food-grade hydraulic fluid leaking into the water. The fluid rose to the surface and the contractor cleaned up all of the resulting sheen with absorbent materials. PWB collected samples inside the containment boom, outside the boom, and at the raw water intake.	Raw water sampling for diesel and oil	Yes
June 13, 2013	A sheen was observed in the construction area in the morning. It was discovered that a new boom crane placed on top of the tower had a leak. Contractors cleaned up the sheen with absorbent materials and removed the boom crane from the top of the tower into containment on land. The leaky cylinder was replaced prior to replacing the boom crane on the tower. Samples were collected inside the spill containment boom, outside the containment boom, and at the raw water intake.	Raw water sampling for diesel and oil	Yes

[a]MRL is Method Reporting Limit—the smallest measured concentration of a substance that can be reliably measured using a given analytical method.

8. Hazardous Materials Spills

Hazardous materials spills are handled in accordance with the PWB's Emergency Operations Plan. The bureau also takes measures to prevent spills. For any project, a detailed plan is required to address potential problems—for example, machine operators are required to use absorbent spill pads. PWB personnel conduct on-site inspections for all projects with the potential to affect water quality.

During Water Year 2013, PWB staff received reports, observed, or experienced a few minor incidents with hazardous materials around the two reservoirs. Tables 2 and 3 provide descriptions of the incidents, indicate whether sampling was performed, and whether the results were below the MRL.

Table 2. Hazardous Materials Incidents Within the Bull Run Drainage Boundary

Date	Description	Sampling	Below MRL[a]
Reservoir 1 Vicinity			
April 9, 2013	Sheen on Reservoir 1 near the dam was observed by a PGE operator at Powerhouse 1. The operator conveyed information to Portland Water Bureau staff and a sample of the water with the sheen was collected shortly after the report. Downstream samples collected at Reservoir 2 for another purpose also showed no detections of contaminants associated with diesel and oil.	Raw water sampling for diesel and oil	Yes
May 31, 2013	PWB excavator operating off of Road 10 approximately 300 yards from Reservoir 1 caught fire. During the event, an estimated 15 gallons of hydraulic fluid and 15 gallons of diesel fuel were spilled from the excavator. A portion of these fluids were consumed in the fire. The excavator was surrounded by absorbent spill containment materials. No sheen on water downstream of the excavator or other indications of leaking fluids were observed following the incident. Shortly after the fire, Sandy River crews excavated all soil affected by the spill. The soil was moved to a location outside the drainage area and contained by tarps before being removed from the watershed for disposal.	No	NA
Reservoir 2 Vicinity			
January – September 2013	The turbine area inside Powerhouse 2 was slated for cleaning and refurbishment while it was inactive during the Dam 2 Tower project. In January and April 2013, deteriorated paint samples were tested for lead. Results showed from 6.7 milligrams per kilogram (mg/kg) to 5,100.0 mg/kg. Although no current regulations apply to this specific situation, the Reduction of Lead in Drinking Water Act (effective in January 2014) stipulates a maximum lead content of 0.25% (or 2,500.0 mg/kg) for wetted surfaces of all new components used for drinking water.	Paint sampling for lead upon discovery	No
	On July 30, 2013, a painting contractor removed the lead paint. The work was performed with double containment using lead-safe work practices to clean and contain all paint residue. The bureau's Water Quality and Inspection staff approved plans and ensured adherence to requirements. The removal, repainting, and recoating with NSF-approved material was completed in August 2013. The area was left open for three weeks in order for any volatile chemicals in the paint and coatings to evaporate at normal atmospheric pressure and ambient air temperatures (off-gas). In mid-September 2013, the bureau performed air sampling for volatile organic chemicals (VOCs). The results indicated low levels of VOCs, below health-concern levels. The area was left open for an additional week to allow further off-gassing.	Post-remediation air sampling for volatile organic compounds	No; but values below health-concern levels

[a] MRL is Method Reporting Limit—the smallest measured concentration of a substance that can be reliably measured using a given analytical method.

May 2012 Diesel Fuel Discovery Follow Up

In May 2012 a diesel fuel spill was discovered near the Portland Hydroelectric Project (PHP) Powerhouse 2, maintained and operated by Portland General Electric (PGE).[6] At the time of the event, PWB also implemented a water quality monitoring plan to collect water quality samples before, during, and after remediation. The events listed in Table 3 describe follow-up monitoring conducted by various agencies.

Table 3. Follow Up to May 2012 Diesel Fuel Discovery

Date	Description	Sampling	Below MRL[a]
June 2012	Water sampling at the time of the diesel discovery by both PWB and the Oregon Department of Environmental Quality (ODEQ) indicated laboratory results below the Method Reporting Limit for contaminants associated with diesel fuel in the raw drinking water.	Raw water sampling for diesel and oil	Yes
October 16, 2012	Sampling in the Diversion Pool (which was drawn down and not used for drinking water) before site remediation indicated low levels of contaminants, near the MRL, associated with diesel fuel.	Sampling in the drawn-down Diversion Pool for diesel and oil	No
October 30, 2012	Water sampling in the drawn-down Diversion Pool during site remediation indicated laboratory results below the Method Reporting Limit for contaminants associated with diesel fuel.	Sampling in the drawn-down Diversion Pool for diesel and oil	Yes
November 13, 2012	PWB's water sampling in the drawn-down Diversion Pool after site remediation indicated laboratory results below the Method Reporting Limit for contaminants associated with diesel fuel.	Sampling in the drawn-down Diversion Pool for diesel and oil	Yes
November 13, 2012	A trace of naphthalene was detected at 0.024 micrograms per liter (µg/L) in the storm drain and downstream in the Bull Run River at 0.028 (µg/L). These levels are just above the laboratory's reporting limit and are presumed to have come from excavating pavement during the remediation process.	Sampling in the storm drain and downstream in the Bull Run River	No
December 13, 2012	PGE's first round of site monitoring as part of its remediation plan indicated laboratory results below the Method Reporting Limit for contaminants associated with diesel fuel in the groundwater monitoring wells around the site of the spill.	Groundwater sampling for diesel and oil	Yes
March 26, 2013	PGE's second round of site monitoring as part of its remediation plan indicated laboratory results below the Method Reporting Limit for contaminants associated with diesel fuel in the groundwater monitoring wells around the site of the spill.[b]	Groundwater sampling for diesel and oil	Yes
April 9, 2013	On April 9, 2013, PWB collected several follow-up samples. These included Reservoir 2, the Diversion Pool, the raw water intake, the	Sampling raw water and	Yes

[6] The Annual Watershed Control Program Report for Water Year 2012 provides a detailed description of the cleanup, the water sampling conducted, and PGE's remediation plan.

Table 3. Follow Up to May 2012 Diesel Fuel Discovery

Date	Description	Sampling	Below MRL[a]
	storm drain to the lower Bull Run River, and the lamprey barrier in the lower Bull Run River. All of these samples indicated laboratory results below the Method Reporting Limit for contaminants associated with diesel fuel.	various locations for diesel and oil	

[a] MRL is Method Reporting Limit—the smallest measured concentration of a substance that can be reliably measured using a given analytical method.
[b]The next round of monitoring will occur during Water Year 2014 and will be reported in the 2014 Annual Watershed Control Program Report.

9. Tours

The bureau typically conducts public tours of the Bull Run watershed from May through October. The purpose of public tours is to provide the public with access to the otherwise closed watershed and to educate the participants about the history, natural resources, and function of the watershed within Portland's drinking water system.

All public tours are conducted with an emphasis on protecting water quality. PWB staff inspect tour vehicles for fuel leaks before entering the watershed. At the beginning of the tour, all participants are informed of the watershed rules. These rules include requirements that participants use only the provided sanitary facilities and avoid contact with Bull Run raw water. To prevent the spread of invasive species, tour participants are also required to use a boot brush to clean shoes prior to boarding the tour vehicle.

From October 1, 2012 to September 30, 2013, 69 tours were conducted through PWB's tour program with a total of approximately 1,550 participants.

10. Compliance with Unfiltered Criteria

The criteria for unfiltered systems include source-water and site-specific criteria. The source-water criteria include source-water bacteriological quality and turbidity requirements. These are reviewed in the Annual On-Site Watershed Control Program Inspection Report prepared by OHA staff. The site-specific conditions include the following:

- Meet disinfection requirements:
  - (a) Three-log inactivation of *Giardia* cysts and four-log inactivation of viruses
  - (b) Redundant disinfection components or automatic shutoff of delivery of water to the distribution system when the chlorine residual is below 0.2 milligrams per liter (mg/L)

(c) The residual disinfection concentration at the entry point cannot be less than 0.2 mg/L for more than four hours

(d) Disinfectant residuals in distribution system cannot be undetectable in more than 5% of the samples each month for any two consecutive months

- Maintain a watershed control program and submit an annual watershed control program report
- Be subject to an annual on-site inspection of the watershed control program and the disinfection treatment by OHA
- Not be identified by OHA as a source of waterborne disease outbreak
- Comply with total coliform requirements for 11 of the previous 12 months
- Comply with requirements for total trihalomethanes, haloacetic acids, bromate, chlorine, chloramines, and chlorine dioxide

PWB has met all of these criteria during Water Year 2013.

11. Results of OHA Watershed and Disinfection System Survey

The watershed and disinfection system inspection for Water Year 2013 was conducted on August 20, 2013. OHA transmitted a draft of its annual on-site watershed control program inspection report to PWB on October 25, 2013. OHA's overview of the site visit states the following:

> Overall, the watershed is well protected and the treatment facilities have redundant disinfection options with auxiliary power. The Portland Water Bureau continues to do an excellent job maintaining the water quality from Bull Run and being proactive with the watershed control program.

No significant deficiencies were noted and the report concludes with the following:

> The Portland Water Bureau continues to meet all of the criteria for the exemption from filtration, and can therefore remain using an unfiltered surface water source as allowed in the Surface Water Treatment Rule.