PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

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Subject: T3-2022-16220 Bull Run Filtration Projects

Filtration Facility Operations Supplemental Information

The filtration facility is designed to protect public health by reliably providing clean safe drinking water 24/7. The facility will be staffed with certified and trained operators to make sure the systems are managed in a manner that fully protects public health and the environment. All treatment chemicals currently used by the Water Bureau, and those proposed for future use at the filtration facility, are commonly and safely used at drinking water treatment facilities nationwide.

Operations History

The Water Bureau currently operates two water treatment facilities in the project area that have safety protocols and training in place to manage delivery, storage, and use of treatment chemicals.

Portland began adding chlorine to Bull Run water in 1929 to disinfect against waterborne bacteria and viruses, and ammonia in 1957 to help the disinfectant last. Corrosion control treatment was added using sodium hydroxide in 1997 and now soda ash and carbon dioxide since 2022 to adapt to changing science and regulations and further reduce lead leaching from some home plumbing.

These treatment steps for disinfection and corrosion control take place at Headworks in the Bull Run Watershed and at the Lusted Hill Treatment Facility located about half a mile from the filtration facility site. Both locations receive regular chemical deliveries year-round using the same road network as the filtration facility.

The Water Bureau has been operating the Lusted Hill Treatment Facility in the Rural Fire Protection District 10 boundaries since 1992 and, according to Water Bureau records, has not required an emergency response from a fire department as a result of facility operations during that time.

Treatment Deliveries

The Water Bureau has made decisions to use inherently safer technologies for drinking water treatment. Once the filtration facility is operating, the disinfection and corrosion control treatment steps at the existing treatment facilities in the project area will be integrated into the treatment process at the filtration facility. The associated deliveries of soda ash and carbon dioxide that currently go to Lusted Hill will go to the filtration facility instead.

Although gaseous chlorine has been safely used for disinfection at Headworks for more than 95 years, the filtration facility will instead use onsite generation of hypochlorite, which is an inherently safer technology. The typical process will be to have salt delivered to the filtration facility site where the hypochlorite (dilute bleach) will be made and stored until use in the treatment process. Once the filtration facility is online and operational, the Water Bureau will no longer need chlorine gas for the treatment process.

As noted in the *Traffic Impact Analysis* (September 2022, Staff's Exhibit A.31), "the filtration facility will see a maximum of 16 chemical delivery trucks entering and exiting the site during a 5-day work week." Nearly half of the estimated annual chemical deliveries will be dry products, salt and soda ash.

Some of the materials planned for use at the filtration facility have a hazardous materials classification for transport purposes – for example, carbon dioxide is classified as a non-flammable non-poisonous compressed gas. Transportation of hazardous materials is regulated by the U.S. Department of Transportation (DOT) and the Oregon Department of Transportation (ODOT). The authority of both agencies is derived from the Code of Federal Regulations Hazardous Materials Regulations (49 CFR 171-180). Under these regulations, hazardous materials carriers and shippers are subject to safety requirements that include material identification, employee training, security plans, and incident response among other safety requirements.

Trucks transporting chemicals to the filtration facility will be subject to applicable DOT, ODOT, Pipeline and Hazardous Materials Safety Administration, U.S. Environmental Protection Agency, Federal Motor Carriers Safety Administration, and other federal, state, and local codes and regulations for safe transportation of chemical products. Chemical delivery truck drivers are trained and follow strict industry standards to ensure safe and effective transfer of chemical year-round. In addition, the Water Bureau's typical chemical vendor contracts include site-specific driver safety training requirements related to safe handling, delivery, unloading operations, and spill prevention.

Standard practice, in the unlikely event of a spill, is for responders to follow applicable Safety Data Sheet recommendations for personal protection, containment, and cleanup of the material. For example, if a spill happened during transfer at the facility, the secondary containment would be used to restrict the spread, unnecessary personnel would avoid the immediate area, and a certified disposal service would be contacted. The Water Bureau's typical contracts with chemical vendors include provisions for the vendor to be accountable for appropriate clean up measures in the event of a spill during transport.

Inclement Weather

Certified operators will manage scheduled deliveries and onsite storage of treatment chemicals needed for filtration facility operation. Operators use industry standards and best practices to optimize treatment for seasonal changes in water quality and water demands as well as adjust to external factors such as supply chain considerations or inclement weather that may affect deliveries to the facility.

For example, facility operators monitor weather forecasts and may schedule a top off delivery of a particular chemical prior to or following a winter storm to avoid deliveries in inclement weather. In addition, average system demands in winter are generally lower (approximately 85 million gallons per day compared to the design capacity of 135 million gallons per day), which typically means less overall chemicals are used and onsite storage can serve the facility for longer stretches of time.

The Water Bureau currently operates two treatment facilities in locations subject to inclement weather and staff routinely monitor weather forecasts and make adjustments as needed to maintain safe operations. In the case of Headworks, Water Bureau staff clear snow and maintain the forest roads in the Bull Run Watershed to provide winter access for deliveries and operational needs.

Chemical Storage

The drinking water treatment chemicals that will be used at the facility are all certified as safe for use in drinking water by NSF International and will be stored in accordance with all applicable codes and standards, including the Oregon Fire Code and International Fire Code.

The treatment chemicals will generally be stored in dedicated spaces in or near the Chemical Building. In no case would the overflow basins be used to store hazardous materials.

The chemical storage systems at the facility are designed with multiple safety features, including physical separation of chemical types and secondary containment around storage tanks to facilitate containment of any chemical in the unlikely event of a leak. These engineered systems are in place to help contain a spill onsite until such time as the material can be properly collected and disposed of by certified personnel. Designated containment areas are designed to hold the contents of the largest tank plus 10 percent and 20 minutes of fire flow from the fire suppression sprinklers.

The treatment chemicals planned for use at the facility are summarized in the *Hazardous Materials Management Plan* (Staff's Exhibit E.6), Table 1. At the concentrations and storage volumes that will be used at the facility, no chemicals are considered "highly hazardous chemicals" according to the Occupational Safety and Health Administration's Standard 1910.119 Appendix A List of Highly Hazardous Chemicals, Toxics and Reactives.

Operations and Maintenance

Along with engineered safety features, the filtration facility will be staffed with trained and certified operators to make sure the systems are managed in a manner that fully protects public health and the environment. Operator responsibilities include overseeing the treatment

process and 24/7 monitoring and control of the Supervisory Control and Data Acquisition (SCADA) and other critical systems from the Administration Building. The Administration Building also includes a water quality analysis area equipped for staff to conduct testing to make sure drinking water continues to meet all federal and state standards.

During rounds, operators will perform routine monitoring and safety checks and follow standardized operating procedures. The Water Bureau also has a preventative maintenance program to make sure equipment and systems continue to operate safely and as expected.

Training and Emergency Response

Water Bureau operators are trained to use safety procedures, engineering controls, and personal protective measures to minimize risk of any incident requiring emergency response. These measures include standard safety and emergency response training in First Aid, Incident Command System, confined space entry, and Hazardous Waste Operations and Emergency Response (HAZWOPER). Operators use appropriate personal protective equipment (gloves, eye protection, etc.) and the facility is designed with eyewashes, safety showers, and other features for worker safety.

As part of current Water Bureau practices, operators take a 24-hour OSHA HAZWOPER training when hired and then an 8-hour refresher course annually. Operators receive training at the HAZWOPER "technician" level which prepares individuals to respond to releases or potential releases for the purpose of stopping the release. The courses include exercises based on potential realistic scenarios that could be encountered at the facility.

Water Bureau operators are trained annually on confined space entry. There are two types of confined spaces, as defined by OSHA: permit required confined space which has a rescue training requirement and alternate entry confined space which does not have a rescue training requirement. Most of the filtration facility's confined spaces will be alternate entry confined spaces. The Water Bureau hires trained rescue personnel to support work in any permit required confined space.

Facility Security

The Water Bureau's operation of current and future facilities prioritizes safety and security of critical infrastructure. The filtration facility will be accessible only to authorized personnel and is designed with safety and security monitoring systems. The facility will have 24/7 onsite operations staffing, security fencing, 24/7 offsite security personnel, remote monitoring, infrared cameras, and patrols.

Like other community water systems serving more than 3,300 persons, the Water Bureau complies with EPA America's Water Infrastructure Act requirements related to conducting risk and resilience assessments and developing emergency response plans that incorporate findings of that assessment. This process considers both potential malevolent acts and natural hazards as well as means to improve resilience of the system through physical and cybersecurity measures and monitoring practices.

Lighting and Sound

The facility is designed to be as unobtrusive as possible. This includes clustering the facility campus toward the center of the approximately 95-acre site to help screen views of the facility and provide a buffer from adjacent neighbors. The exterior facility lighting is designed with fixtures that meet Multnomah County's Dark Sky standards (MCC 39.6850), have no uplight component, create no light spill beyond the property line, and use warm light sources to minimize nighttime lighting impact on people and animals. Beyond meeting code requirements, the lighting controls are also set to be dimmed to the minimum needed for security and safety under normal conditions and only increased to full output when needed using motion sensors or manual switches.

Although filtration facilities operate 24/7, typical activities vary throughout the course of the day. For example, routine maintenance and deliveries are generally scheduled during the day shift, while the night shift will have fewer staff onsite. In addition, the filtration facility is designed to move water by gravity rather than by using pumped systems which tend to be the most noticeable noise sources at water treatment facilities. The facility also has sound attenuation for mechanical equipment so those sounds stay within allowable code limits at all times. Other operational noises, like water moving through basins when the backwash filters run, will be intermittent.