Adverse Effects of Portland Water Bureau's Proposed Water Treatment Plant on Natural Resources

Failure to Satisfy Conditional Use Criteria MCC 39.7515(B)



Prepared For:

Multnomah County Hearings Officer
Multnomah County Commission
Oregon Land Use Board of Appeals

Prepared By:

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Cover photos: *Images of some of the Portland Water Bureau's water treatment plant site impacts. Construction aggressively began during the Land Use Board of Appeals review, resulting in irreparable harm to natural resources before a proper evaluation of potential effects could be conducted. Erosion (upper left), stormwater runoff and sedimentation (upper middle), tree clearing (upper right), and soil excavation and relocation (bottom) are among the numerous impacts documented at the site. All photos were taken of actual impacts caused by the project at the site and nearby properties.*

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CONTENTS

Executive Summary 1
Background 4
Interpretation of Natural Resources Criteria 6
Regulatory Protections for Natural Resources in the West of Sandy River Planning Area 6
Natural Resource Impacts 10
- Water 10
  - Surface water resources 10
  - Groundwater resources 23
- Air 28
- Soil 29
  - Erosion 29
  - Slope Stability and Landslide Risk 30
  - Offsite Soil Relocation and Erosion 34
- Birds, Mammals, and Pollinating Insects 37
  - Hedgerows and Field Edges 42
  - Communication towers 48
- Fish, Amphibians, and Aquatic Insects 49
  - Fine Sediment Inputs 54
  - Toxic Runoff 55
  - Temperature Increases 55
  - Flashy Flows 56
- Aesthetic Resources: Scenery, Landscape, Soundscape, Natural Darkness 57
- Agricultural Resources 63

Conclusion 65
References 66
Author Qualifications 69

List of Figures

Figure 1. Aerial photo (March 2025) of the 90-acre water treatment plant construction site (looking north) showing its proximity to the Sandy River just 750 feet to the east of the designated "Natural River Area" boundary under the Wild and Scenic Rivers Act. 8

Figure 2. Aerial photo (March 2025) of the 90-acre water treatment plant construction site (looking east) showing its proximity to the Sandy River, designated "Natural River Area" under the Wild and Scenic Rivers Act. 9

Figure 3. Aerial photo of the 90+ acre water treatment plant construction site (looking northeast) showing its proximity to Johnson Creek and the federally designated Wild and Scenic Sandy River. Stormwater collection and facility retention basins were intentionally sited 200 ft from the creek to facilitate discharge of excess storm water into the creek, away from the site. The creek is also currently being used to convey pumped groundwater from the local aquifer out from the construction site. 11

Figure 4. Pre-construction topography of the filtration site (*GoogleMaps*). Dotted red lines are the approximate outline of the filtration project. Arrows indicate water conveyances permanently removed or impacted by the project. 12

Figure 5. Stormwater discharge from PWB's construction site directed into Johnson Creek and its associated riparian area through the use of hay bales and silt fencing (February 2025). Hay bales were installed as a form of erosion control after formal complaint made by community members to Oregon Water Resources Department and the Oregon Department of Environmental Quality in January 2025. Hay bales did not alleviate erosion, channelization, or increased sedimentation of Johnson Creek. 13

Figure 6. Property associated with raw water portal near 37077 SE Lusted Rd. before raw water portal staging construction (A) Street view of the entrance of impacted property (October 2023, *GoogleMaps*); (B) Existing wetland, associated wetland grasses, pasture and surrounding trees (February 2024). 15

Figure 7. Impacts at property associated with raw water portal near 37077 SE Lusted Rd. after raw water portal staging construction (photos taken February 2025) (A) Approaching pond with access bridge and concrete sound barrier; (B) Pond with erosion control material viewing from constructed bridge; (C) Pond-associated wetland with stream on other side of bridge; (D) Cleared deciduous trees prior to grading and gravel (Winter 2024/2025); and, (E) Current state of construction site entrance. 16

Figure 8. Finished pipeline route (*blue hashed line*) crosses existing high value farmland from SE Dodge Park Blvd northerly to SE Lusted Road. Pipeline route impacts both the middle fork and north fork of Beaver Creek. 18

Figure 9. Proposed filtration facility location in relation to the nearby waterways of Beaver Creek, Johnson Creek, and the Sandy River. 19

Figure 10. Area's lack of stormwater drainage infrastructure results in poorly controlled overland runoff and drainage negatively impacting residences and farms on SE Lusted Rd and the north fork of Beaver Creek (*photo credit: Guy Meacham*). (A) Muddy runoff with ineffective storm water control (i.e., hay bales) at the construction staging for the finished water pipe route at 33444 SE Lusted Rd; (B) Runoff draining and directed from staging area, headed east and downhill toward Beaver Creek; (C) Runoff directed into residence (33608 SE Lusted Rd) adjacent to Beaver Creek, and downhill from staging area; and, (D) Runoff entering north fork Beaver Creek (*red arrow*) from residence at 33608 SE Lusted Rd. 20

Figure 11. Significant negative impacts of altered landscape and erosion control measures on agricultural resources and existing farmland in fall of 2024 (*photo credit: Surface Nursery*). The location captured in the photos are along the finished pipeline route between SE Dodge Park Blvd and SE Lusted Road. (A) Excessive flooding of Surface Nursery property following fall rain events causing inaccessibility for farm operators; and (B) Flooded field of newly planted nursery stock saplings. 21

Figure 12. Overland flow of groundwater pumped from the filtration construction site and directed into Johnson Creek. (*Photo credit: Jennifer Hart; January 30, 2025*). (A) Approximately 1,600 gallons per minute, or 3-4 cfs, is being pumped into Johnson Creek on workdays (6 days per week), 10-11 hours per day, suddenly increasing and decreasing stream flow on a regular basis. (B) Excessive discharge of significant volumes of water creates channelization and sediment transport into Johnson Creek (*see white arrows*) negatively impacting the riparian habitat and the naturally occurring water quality conditions of the creek. 23

Figure 13. Map of domestic wells proximate to the proposed facility. 26

Figure 14. Example of erosion occurring at PWB's construction site. 30

Figure 15. Map of proposed facility and local geologic features, including historic landslides. . 33

Figure 16. Photos taken in November 2022 at the Oxbow property documenting erosion at the site and mobizing directly into the Wild and Scenic Sandy River. (A, B) Extensive erosion and channelization; (C, D) Bare loose soils surrounding extreme channel incision that is 4 feet deep and 3 feet wide. 36

Figure 17. Photos taken by DEQ on 12/27/24 at the Gramor property on SE Highway 212 documenting uncontrolled runoff from contaminated soils deposited at the site. 37

Figure 18. Photos of resident and migratory mammals near the raw water portal, filtration facility, site, and Johnson Creek. Black bear, cougar, deer, coyote, bobcat, elk, and beaver are regularly seen. The Wild and Scenic Sandy River is a federally-protected migratory corridor for species such as Roosevelt elk (two bottom right tiles). Animals migrate through the Sandy River canyon and regularly forage at residences and farms near SE Lusted Rd and SE Dodge Park Blvd. All photos were previously submitted into the Multnomah County record in 2023 except the river otter photo (upper right tile). The river otter was photographed in 2025 from a resident who lives at the headwaters of Johnson Creek. These are just a few of the hundreds of wildlife photos collected from local residents during development of this report. 39

Figure 19. Resident and migratory bird species observed adjacent to Johnson Creek headwaters. From left to right: red-breasted nuthatch, varied thrush, black-capped chickadee, grosbeak, red-winged blackbird, northern flicker, downy woodpecker, bushtits. 40

Figure 20. Representative photos of birds of prey regularly observed at and near filtration site and raw water portal. (A) Bald eagle perched in nearby Douglas fir; (B) Perched resident red-tailed hawk on tree on filtration site (tree was cleared for site preparation); (C) Bald eagle perched in nearby cottonwood tree. 40

Figure 21. Hedgerows are high quality habitats OSU Extension (2022), consisting of foliage similar to the former hedgerow on SE Dodge Park Blvd. Preconstruction hedgerow was an established habitat similar to this (see proceeding Figure 22) 43

Figure 22. Before tree removal along SE Dodge Park Blvd (*GoogleEarth, accessed April 10, 2025*). Hedgerow was a mix of mature deciduous and coniferous/evergreen trees and shrubbery. (A) Approximately 0.7 miles of continuous hedgerow existed to the west of SE Cottrell Rd (*imagery from April 2023*); (B) Corner of SE Cottrell Rd and SE Dodge Park Blvd and looking at hedgerow looking west along SE Dodge Park Blvd (*imagery from June 2023*); (C) Approximately 0.3 miles of hedgerow was present east of SE Cottrell Rd. (*imagery from April 2023*); (D) Corner of SE Cottrell Rd and SE Dodge Park Blvd and looking at hedgerow looking east along SE Dodge Park Blvd (*imagery from June 2023*). 44

Figure 23. Representative tree diversity and ages of SE Dodge Park Blvd hedgerow removed in October 2024. 45

Figure 24. Owls observed in SE Dodge Park hedgerow prior to hedgerow removal and clearing. (A) Great horned owl (*Bubo virginianus*), perched in bitter cherry tree surveying nearby agricultural field on March 5, 2024 (*photo credit: Jennifer Hart*); (B) Western screech owl (*Megascops kennicottii* – identified by call) perched in Bigleaf maple (*see white arrow*), March 20, 2024. Western screech owls are considered a "species of concern" by ODFW. 46

Figure 25. Following hedgerow tree and habitat removal on SE Dodge Park Blvd, October 2024 (*photo credit: Guy Meacham*). Between 320-400 trees (> ½ foot in diameter) and countless shrubs were removed across one contiguous mile. (A) Stumps of old conifers (Douglas fir, multiple aged at ~80 years old) at the corner of SE Cottrell Rd and SE Dodge Park Blvd, looking west; (B) Cleared portion of SE Dodge Park Blvd where hedgerow existed, looking east to SE Cottrell Rd; (C) Stump of old red cedar (~100 years old, foreground) and stumps of big leaf maple, cherry, and Douglas fir trees, looking west toward SE Cottrell Rd; (D) Stumps of Douglas fir, including one that was aged at 80+ years old, near the intersection of SE Cottrell Rd and SE Dodge Park Blvd looking west. 47

Figure 26. Row of four mature, 60+ year old red cedars (left) on SE Carpenter Lane near hedgerow on SE Dodge Park Blvd that were harvested in fall of 2024. All trees and shrubbery along SE Carpenter has been cleared (right) to double the width of the lane to accommodate filtration project traffic. 48

Figure 27. Salmon and trout distribution within Johnson Creek, Beaver Creek, and the Sandy River adjacent to the proposed filtration facility and associated pipelines. 51

Figure 28. Pictures from a stream survey conducted on August 22, 2023 in Johnson Creek directly adjacent to PWB's proposed development site at Carpenter Lane. (left) Snorkel survey to confirm fish presence (center). Water quality measurements indicating suitable dissolved oxygen (>8 mg/L) and summer temperature (<18 ºC) conditions for native cold-water fish species. Measurements taken at 17:00 PDT when stream temperature was at its daily peak. (right) Dense riparian vegetation surrounding the creek. 52

Figure 29. Amphibian species present at the filtration site and within the Johnson Creek habitat directly adjacent to the site (~150 ft from construction boundary) (*photo credit – all: Lauren Courter).* (A) Native northern red-legged frog, *Rana aurora* (August 22, 2023) located at 45°27'40.7"N 122°18'00.8"W, within Johnson Creek riparian habitat; (B) Pacific tree frog, *Pseudacris regilla* (June 12, 2020) at filtration site; (C) Native rough-skinned newt, *Taricha granulosa* (white arrow, inset) (October 22, 2023), at filtration site; and (D) Cascades frog, *Rana cascadae* (August 22, 2023), located at 45°27'40.7"N 122°18'00.8"W, within Johnson Creek riparian habitat. 54

Figure 30. Aerial picture of the water treatment plant showing its contrast to the surrounding environment. There are no facilities as large or remotely similar to Portland's proposed treatment plant anywhere within a 5-mile radius. All the industrial buildings in the region are agricultural businesses. PWB often cites to the existence of their Lusted Hill facility as a comparable site about 1-mile north of the proposed development area, but the Lusted Hill facility is tiny by comparison, barely visible from the air and hidden in the trees. 60

Figure 31. Wildlife migration corridors surrounding filtration (red outline) and pipeline projects, according to the Oregon Conservation Strategy. Orange star denotes location of blasting and boring for the raw water pipeline. Purple tiles represent *regions*, or "highest-value habitat for facilitating species movement". Yellow tiles denote *connectors*, or "the best available habitat for facilitating movement from *Region* to *Region*. *Connectors* may pass through high-quality habitat in intact, relatively undisturbed parts of the landscape, as well as the best remaining marginal habitat in developed or degraded areas." 61

Figure 32. This photo, taken from a property adjacent to the water treatment plant construction site, illustrates light intrusion and its impact on night-sky conditions. 24-hour lighting at the completed facility is expected to be of similar intensity. 62

EXECUTIVE SUMMARY

The Portland Water Bureau (PWB) has proposed the construction of a $2+ billion water filtration facility on a 90-acre parcel of farmland located at the east end of Carpenter Lane in rural east Multnomah County. The facility is intended to comply with state and federal requirements for treating cryptosporidium, despite no known cases of illness caused by Portland's water supply. Moreover, the project's scope has expanded to include numerous costly and impactful components unrelated to cryptosporidium treatment. The proposed site, zoned for Multiple Use Agriculture-20 (MUA-20), lies within a designated Rural Reserve and is adjacent to the federally protected Wild and Scenic Sandy River corridor. The project has triggered widespread concern due to its adverse impacts on natural resources and its failure to meet Conditional Use Criteria outlined in Multnomah County Code 39.7515(B).

Failure to Meet Land Use and Environmental Criteria

In January 2025, the Oregon Land Use Board of Appeals (LUBA) remanded a previously approved land use permit, citing significant errors in the analysis of natural resource impacts. Multnomah County hearings officer, Alan Rappleyea narrowly interpreted "natural resources" to only include designated overlay areas, disregarding broader ecological features such as surface water, wetlands, wildlife habitats, and rural character. Despite LUBA's ruling, PWB continued construction under a self-designated "wind-down" period, causing irreversible environmental damage and further eroding public trust. The project lacks a full inventory of natural resources, and its mitigation measures and "best management practices" fall short of meeting the non-negotiable standard that the proposed use "will not adversely affect natural resources." In fact, PWB's proposed mitigation and remedial measures indicate that the project fails to meet Conditional Use Criteria 39.7515(B), which is intended to prevent impacts to natural resources before they occur.

Documented Long-Term Environmental Damage

The site preparation and ongoing construction have already caused serious harm to natural resources. These adverse effects will persist long after the construction phase of the project is complete:

- Over **1 million cubic yards of soil has been excavated and removed or relocated on site**, altering natural topography over a large area.
- **Stormwater and groundwater are being discharged directly into Johnson Creek**, a tributary to the Willamette River and part of the region's Significant Environmental Concern overlay.
- **Groundwater pumping at rates exceeding 1 million gallons per day** has significantly modified riparian habitat and creek flow patterns, threatening fish and amphibian populations.
- **Destruction of two natural draws and wetland habitats** has altered local hydrology and affected wildlife reliant on seasonal wetland ecosystems.

- **Approximately 90 acres of high-value farmland have been permanently lost**, eliminating productive agricultural land and disrupting the area's rural land-use vision.
- **Scenic resources, including panoramic views and rural landscape patterns, have been severely compromised** by the introduction of large-scale industrial infrastructure, degrading the visual and aesthetic character of the region.
- **Over 300 mature trees were removed**, reducing wildlife habitat and extracting mature timber resources.
- **Unnatural noise and lighting have caused habitat fragmentation**, disturbed wildlife, and diminished the area's scenic and acoustic quality.
- **Aesthetic degradation**—through visual, auditory, and night-sky impacts—has substantially eroded the rural character of the Cottrell and Pleasant Home communities.

Regulatory Gaps and Oversight Failures

In addition to onsite impacts, PWB also transported contaminated soil (containing banned pesticides like DDT and Dieldrin) to nearby agricultural properties without proper erosion control or disclosure during land use hearings. The Gramor and Oxbow sites, both owned by T&K Sester Farms, have experienced unpermitted clearing, erosion, and wetland destruction. These activities have violated environmental standards and revealed a troubling lack of enforcement by regulatory agencies such as the Oregon Department of Environmental Quality (DEQ).

PWB staff have developed a reputation for ignoring environmental policies pertinent to their project. As an example, project proponents sidestepped the requirements of the National Environmental Policy Act (NEPA) by avoiding preparation of a formal Environmental Impact Statement (EIS)—despite using federal funding and constructing a facility within 750 feet of the federally designated Wild and Scenic Sandy River**.** Under NEPA, such a project would typically require an EIS due to its scale, location near sensitive habitats, and potential for irreversible environmental impacts. However, PWB proceeded without triggering a full federal review process, raising serious legal and procedural concerns about the adequacy of environmental oversight and interagency coordination.

Long-Term Consequences and Summary Conclusion

The cumulative effects of this mega project—including increased impervious surface area, erosion, loss of native vegetation, and groundwater interference—pose permanent threats to local ecosystems, farmland, community water sources, forest, and aesthetic resources. Furthermore, without a full Environmental Impact Statement (EIS), robust groundwater management, and stormwater infrastructure, impacts to natural resources are exacerbated. Sadly, we do not have to theorize about possible adverse effects on natural resources because numerous irreparable impacts have already occurred.

PWB's proposed water filtration facility and related infrastructure do not meet the conditional use standard required by Multnomah County to protect natural resources. The impacts

documented are not only substantial but irreversible. Restoration of the affected areas is unlikely within our lifetime, and mitigation proposals fall far short of offsetting the ecological and community damage already underway. Based on direct, observable evidence, this project threatens the long-term environmental integrity and rural character of the West of Sandy River Planning Area. Based on these findings, **we urge the Multnomah County Hearings Officer to deny Portland Water Bureau's application for a Conditional Use Permit.**

BACKGROUND

The Portland Water Bureau (PWB) is required by the Oregon Health Authority (OHA) to build a facility capable of treating cryptosporidium, a parasite that can cause non-life-threatening illnesses like diarrhea and stomach pain but poses a greater risk to immunocompromised individuals. The Environmental Protection Agency (EPA) mandates treatment for cryptosporidium when municipal water systems use uncovered surface water sources, as the parasite can enter the water supply through animal feces.

Although cryptosporidium is rarely detected at the source of Portland's water supply—and there have been no detections at the point of consumer use or any reported infections linked to the City of Portland's water—OHA still requires treatment. To comply, PWB has applied for a Conditional Use permit to build a water filtration plant on a 90-acre parcel at the east end of Carpenter Lane in rural east Multnomah County. The proposed $2+ billion industrial facility, covering a 50-acre footprint, is expected to take 5–7 years to construct and would primarily serve municipal water users in the City of Portland.

PWB proposed filtration as its preferred cryptosporidium treatment method in 2018 but included extensive additional treatment components to address unrelated water quality and system operation issues. The City's plans also include a new administrative office building within the treatment plant grounds, featuring extravagant design elements such as multiple conference rooms with mountain views, a yoga studio, and staff locker rooms. The estimated cost of the project has ballooned from roughly $300 million at its initial conception to over $2.13 billion and counting.

PWB has referred to this project as a "mega project," the largest infrastructure undertaking in its history (Portland City Council hearing, June 28, 2023). To avoid public opposition within Portland's city limits (Jacobs Engineering, 2018), PWB selected the Carpenter Lane site zoned for Multiple Use Agriculture-20 (MUA-20), located outside the urban growth boundary in a designated "Rural Reserve." The chosen 90-acre parcel of farmland, within the West of Sandy River Planning Area, is protected under Multnomah County land use policies to preserve natural resources and agricultural land outside the Portland metropolitan area. The proposed site is also less than a quarter mile from the Wild and Scenic Sandy River corridor, home to federally protected species such as Chinook salmon, steelhead trout, wolverines, red tree voles, northern spotted owls, and streaked horned larks, along with numerous other state and federally protected wildlife and game species. Notably, white tailed deer, Roosevelt elk, black bear, cougar, and bobcat inhabit and migrate through the area in significant numbers.

Facility design began in 2018. In early 2023, PWB submitted its plans and land use application materials to Multnomah County. A land use hearing was held on June 30, 2023, and on November 29, 2023, the hearings officer, Alan Rappleyea approved the project's conditional use permit.

However, the Cottrell Community Planning Organization (CPO), Pleasant Home Community Association, Rural Fire District 10, Hawk Haven Equine, 1000 Friends of Oregon, Oregon Association of Nurseries, Multnomah County Farm Bureau, and Gresham-Barlow School

District appealed the decision to the Oregon Land Use Board of Appeals (LUBA). On January 22, 2025, LUBA remanded the Multnomah County hearings officer's decision, citing a misinterpretation and incorrect analysis of Conditional Use Criteria MCC 39.7515(B)—which requires that the project "will not adversely affect natural resources." LUBA determined that the hearings officer interpreted the natural resources condition too narrowly. PWB did not provide an inventory of all natural resources at, and adjacent to, the site or documentation assessing the project's potential impacts on those resources. Additionally, the hearings officer improperly accepted PWB's definition of natural resources as limited to those within the County's Significant Environmental Concern (SEC) overlay areas. The hearings officer narrowly defined the scope of his analysis, considering only impacts within the proposed development area. Whereas LUBA took a broader approach, defining "natural resources" expansively and stating that *the hearings officer must determine whether <u>any</u> natural resources will be affected by the community service use and <u>ensure that the proposed use will not adversely impact those resources</u>*.

Rather than waiting for the land use appeal process to conclude, PWB aggressively moved forward with construction immediately after receiving initial approval from Multnomah County. As a result, significant natural resource impacts have already occurred, including removal of approximately one million cubic yards of agricultural soil, groundwater pumping and discharge into Johnson Creek (approx. 1-million gallons per day), untreated stormwater runoff into nearby waterways, erosion at the construction site and a nearby site used for soil relocation, destruction of a small tributary to Johnson Creek, the removal of over 300 mature coniferous and deciduous trees, and the release of thousands of tons of CO_2 emissions from construction equipment and haul trucks. Residents have also reported a decline in local wildlife, increased light and noise pollution, and severe aesthetic degradation. Additionally, the pre-construction natural resource inventories referenced in the LUBA decision can no longer be conducted, as many of the resources have already been destroyed or significantly altered by PWB's actions. Furthermore, with Multnomah County's approval, PWB disregarded LUBA's remand and continued construction under the guise of a "wind-down period," which has now extended beyond six weeks and is ongoing. Construction activities occurring at the site during the wind-down period have included additional excavation and earth moving and a large concrete poor involving hundreds of concrete trucks.

This report provides clear evidence of the adverse impacts that PWB's proposed project has already had on natural resources, as well as the anticipated future effects of its continued construction and eventual operation. While PWB claims that these impacts can be mitigated through onsite and offsite restoration attempts, or minimized through Best Management Practices, this argument is inconsistent with a proper interpretation of the Conditional Use Criteria (MCC 39.7515(B)). Moreover, it reflects a lack of understanding of the project's true effects. The natural resources being damaged by this project will take hundreds, if not thousands, of years to recover. As the following sections will demonstrate, allowing PWB to proceed will result in further irreparable harm to the area's natural resources.

INTERPRETATION OF NATURAL RESOURCES CRITERIA

The *West of Sandy River Land Use and Transportation Plan* (2002) outlines a clear vision for the area and establishes policies to guide future development. Given the significance of agriculture and natural resources in the region, non-agricultural uses within MUA-20 and EFU zoning are not typically allowed. Instead, non-agricultural uses must meet particularly stringent Conditional Use Criteria designed to protect agriculture and natural resources.

PWB and Multnomah County misconstrued both the definition and application standard for Conditional Use Criteria MCC 39.7515(B). First, while Multnomah County's Comprehensive Plan does not provide a singular, explicit definition of "natural resources," it is clear that the term encompasses various elements, including water bodies such as lakes, creeks, streams, and major rivers like the Columbia, Willamette, and Sandy. Additionally, it highlights wetlands, fish and wildlife habitats, scenic views, tree protection, air and water quality, and wilderness areas as integral components of the county's natural resources. The plan emphasizes the importance of preserving these resources to maintain environmental quality and the county's rural character, and it outlines policies for managing and protecting them.

Second, the standard for satisfying Conditional Use Criteria MCC 39.7515(B) is clear and unambiguous—it does not allow mitigation as a means of addressing impacts. If mitigation were intended as an option for conditional uses, the criteria would specify terms like “no net impact” or “to the extent practicable.” PWB has argued that a strict and literal interpretation of “will not adversely affect” is unreasonable because meeting such a standard would be impossible for their project, which is precisely the point, and reflects PWB’s lack of understanding of the long-term vision for the West of Sandy River Planning Area. The natural resources conditional use criteria is deliberately restrictive. There is no provision for merely minimizing or mitigating effects, nor does the policy define an acceptable degree of impact. This rigidity was intentional by Multnomah County planners to ensure that conditional uses do not degrade natural resources.

REGULATORY PROTECTIONS FOR NATURAL RESOURCES IN THE WEST OF SANDY RIVER PLANNING AREA

The West of Sandy River Planning Area is protected by a combination of regulations from Multnomah County, the State of Oregon, and federal agencies, all aimed at preserving its natural resources, agricultural lands, and sensitive habitats. Strict zoning laws, water quality regulations, and habitat conservation measures work together to safeguard the region’s ecological integrity while limiting industrial development and urban encroachment.

Multnomah County is responsible for enforcing land use regulations that protect natural resources and agricultural lands within the Multiple Use Agriculture-20 (MUA-20) zoning designation. The county’s Conditional Use Criteria (MCC 39.7515) impose strict limitations on industrial and large-scale infrastructure projects to prevent adverse environmental impacts. Additionally, the *West of Sandy River Land Use and Transportation Plan* (Multnomah County, 2002) provides a long-term vision for the area, prioritizing farmland preservation, watershed

protection, and habitat conservation. This plan explicitly discourages development that could degrade natural resources or disrupt the region's agricultural economy.

At the state level, the Oregon Department of Agriculture (ODA) regulates land use and water quality within designated agricultural zones to ensure the long-term viability of farmland and the protection of soil and water resources. The ODA enforces the Agricultural Water Quality Management Program, which prevents pollution from both agricultural and non-agricultural sources, ensuring clean water for ecosystems and farming operations. Additionally, state laws restrict urban expansion into Exclusive Farm Use (EFU) and MUA-20 zones to preserve the region's rural character and protect agricultural production areas.

Further protections exist at the federal level. The Sandy River is designated as a Wild and Scenic River, granting it additional safeguards under the Wild and Scenic Rivers Act. This designation helps protect water quality, fish and wildlife habitats, and recreational values along the river corridor. The proposed project site is about 750 feet from the boundaries of the corridor designated *Scenic* and *Natural*[1] of the Sandy River (Figures 1 and 2). The area is also home to federally protected species, including Chinook salmon, steelhead trout, northern spotted owl, wolverine, and red tree vole, necessitating strict environmental oversight. Agencies such as the U.S. Forest Service, Oregon Department of Fish and Wildlife (ODFW), and the National Marine Fisheries Service (NMFS) enforce regulations to prevent habitat degradation, pollution, and erosion near the river. Due the project's size, proximity to a Wild and Scenic River, and use of federal funding, we surmise that construction of this project without completing an Environmental Impact Statement (EIS) would be a violation of the National Environmental Policy Act.

Together, these layered protections reflect a comprehensive effort to maintain the region's ecological and agricultural integrity, ensuring that natural resources remain intact for future generations.

[1] According to the Bureau of Land Management (BLM 1993), "Natural River Area" is defined as *undeveloped, and generally in pristine or near pristine condition.* The management goal of the area within the boundary of the Natural River Area is to *preserve and protect the scenic waterway corridor in its primitive natural condition.*



Figure 1. Aerial photo (March 2025) of the 90-acre water treatment plant construction site (looking north) showing its proximity to the Sandy River just 750 feet to the east of the designated “Natural River Area” boundary under the Wild and Scenic Rivers Act.



Figure 2. Aerial photo (March 2025) of the 90-acre water treatment plant construction site (looking east) showing its proximity to the Sandy River, designated “Natural River Area” under the Wild and Scenic Rivers Act.

NATURAL RESOURCE IMPACTS

Water

Surface water resources

Irreparable Effects to Surface Water at the Filtration Site
Impaired Functioning Natural System: • Stream - Johnson Creek, associated unnamed ephemeral tributary
Site Preparation and Construction Effects: ⇒ Altered topography resulting in change to natural overland flow and drainage in draws and the deletion of two draws ⇒ Increased erosion and sediment mobilization into Johnson Creek ⇒ Altered streambed characteristics from increased sedimentation
Ultimate Use Effects – Filtration Facility, Associated Structures, Grounds: ⇒ Increased flow into Johnson Creek from extensive impervious surfaces and no stormwater infrastructure ⇒ Increased erosion and sediment mobilization into Johnson Creek ⇒ Altered streambed characteristics from increased sedimentation ⇒ Potential changes to macroinvertebrate assemblages due to altered riparian and streambed ⇒ Potential toxic effects to invertebrates and macroinvertebrates from stormwater runoff

The filtration facility is sited approximately 300 ft from the headwaters of Johnson Creek (Figure 3). To construct the filtration facility, PWB has excavated and relocated significant volumes of soil (~1.25 *million* cubic yards), leveled the natural topography of ~90 acres, filled in two natural draws, and has discharged all stormwater effluent and emerging groundwater solely into Johnson Creek. Overland flow patterns and the natural characteristics of Johnson Creek have been permanently changed from significant site preparations for the construction of the filtration facility.



Figure 3. Aerial photo of the 90+ acre water treatment plant construction site (looking northeast) showing its proximity to Johnson Creek and the federally designated Wild and Scenic Sandy River. Stormwater collection and facility retention basins were intentionally sited 200 ft from the creek to facilitate discharge of excess storm water into the creek, away from the site. The creek is also currently being used to convey pumped groundwater from the local aquifer out from the construction site.

The western corner of the facility abuts Multnomah County's Significant Environmental Concern for Water Resources (SEC-wr) overlay, which includes both the creek and riparian area. While it is true that project site itself does not overlap the county's designated SEC, the effects of the project on water resources of the SEC, the site itself, and the surrounding area are significant and permanent.

Prior to construction, the topography of the site was uneven and elevation varied from 720-740 ft at the property's NW, NE, and SE corners. At the SW corner and western edge, the property sloped to 660 ft. As a result of site preparations, the current topography is flat with no variation, except for the tall and wide mountain of spoil at the SE corner. This mountain is constructed with 600,000 cubic yards of soil and far exceeds the natural elevation of the property with an added estimated height of 100 feet. The topographical change of the ~90 acres has dramatically altered overland flow patterns during storm events. Prior to construction, storm runoff that did not

infiltrate into the farmland soil naturally mobilized toward portions of the property with the lowest elevation. These portions were the SW corner toward Johnson Creek's riparian area, the western edge of the property, and at the SE corner. At the western edge of the property, overland flow previously ran off into a small draw that led into an ephemeral tributary of Johnson Creek (Figure 4). Extensive earthwork during site preparations has permanently filled in this draw and it no longer exists. As a result, overland flow and runoff patterns have permanently changed from its previous existence (Exhibit H.1, pg. 24, demonstrates elevation and overland flow prior to construction). Stormwater from the construction site and groundwater being pumped out of extensive 20-30 foot deep excavations (estimated 1,600 gallons per minute at 11 hours per work day; *personal communication* MWH-Kiewit foreman Mr. Goldschmidt January 30, 2025) are solely directed to the southwest corner of the property. Aerial imagery and engineering site plans indicate that Johnson Creek was deliberately selected to channel stormwater and facility overflow (Figure 3, Figure 5, and Exhibit H.1). At the SE corner of the property, near the raw water pipeline portal, a shallow draw existed. During the winter and spring months, overland flow mobilized from the PWB's property and into the neighboring residential property to the east via the draw. The topographical lines in Figure 4 show the natural contour that previously favored drainage at the SE corner of the property prior to construction. Following PWB's excavations, mounding of excess spoils, and the leveling of the property, this drainage no longer exists.

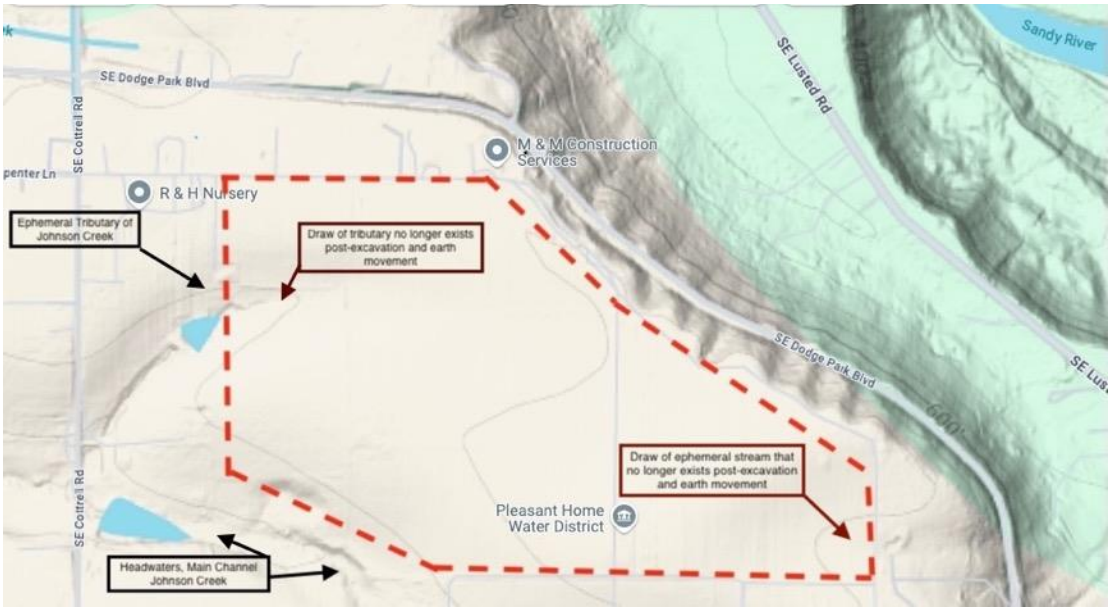


Figure 4. Pre-construction topography of the filtration site (*GoogleMaps*). Dotted red lines are the approximate outline of the filtration project. Arrows indicate water conveyances permanently removed or impacted by the project.



Figure 5. Stormwater discharge from PWB's construction site directed into Johnson Creek and its associated riparian area through the use of hay bales and silt fencing (February 2025). Hay bales were installed as a form of erosion control after formal complaint made by community members to Oregon Water Resources Department and the Oregon Department of Environmental Quality in January 2025. Hay bales did not alleviate erosion, channelization, or increased sedimentation of Johnson Creek.

We are not aware of whether the City of Portland has been monitoring stormwater and related surface soil erosion during construction activities. Geologist, David Rankin conducted a site visit on April 1, 2025, to provide a cursory review of stormwater handling at the Plant site from the publicly accessible perimeter of the Plant. Mr. Rankin also conducted a cursory review of the roadways approaching the Plant. There are open surface basins currently collecting water (including stormwater) from sources of water from the Plant. We presume that much, or all of the stormwater generated on the main Plant site is discharged into the Johnson Creek outfall located near the southwest corner of the main Plant site. Mr. Rankin also reviewed photographs of the treated water discharge outfall at Johnson Creek and conducted a walking review (April 1, 2025).

Following construction and throughout facility operations, stormwater runoff presents a risk to surface water, surrounding habitat, and the species that rely on these areas for breeding, nesting, foraging, and shelter. Since the area lacks stormwater infrastructure, runoff from the site's impervious surfaces flows directly into Johnson Creek. This runoff carries contaminants such as solvents, oils, hydraulic fluid, fuel, and chemical spills from substances stored on site. While PWB notes that the chemicals used are common in drinking water facilities nationwide, it is critical to emphasize that any chemical—whether considered highly or mildly toxic—can be

harmful in large enough quantities. As outlined in Exhibit D.1, nine of the chemicals expected to be stored on-site are classified as corrosive, toxic, oxidizing, combustible, or carcinogenic. These substances will be transported and stored in large volumes, increasing the risk of accidental spills—especially if such an event occurs during or immediately before a rainstorm—potentially contaminating the surrounding ecosystem. Even water treatment chemicals often labeled as "safe," such as sodium chloride and potassium chloride, are fatally toxic to sensitive species like amphibians and juvenile mussels at extremely low concentrations (parts per billion). At higher concentrations (parts per million), these chemicals can also be harmful to fish species that inhabit Johnson Creek and its riparian zone.

In general, the Pleasant Home and Cottrell communities are designated for agricultural use and interspersed residential, not for large-scale municipal development or properties with extensive impervious surfaces. Therefore, no stormwater collection system or related infrastructure exists in these communities, including the filtration project property. Without existing stormwater infrastructure, engineers intentionally designed runoff and excess groundwater to be directed into Johnson Creek. This decision has caused, and will continue to cause, significant harm to Johnson Creek and its fish, macroinvertebrates, and amphibians.

Irreparable Effects to Surface Water at the Raw Water Pipeline
• Impaired Functioning Natural System: Wetland habitat
Site Preparation and Construction: ⇒ Altered topography resulting in change to natural overland flow, drainage, and wetland ⇒ Increased erosion and sediment mobilization into wetland
Ultimate Use – Underground Pipeline: ⇒ Potential altered wetland assemblages of aquatic invertebrates and macroinvertebrates, including amphibian species

In the fall of 2024, PWB began equipment staging and site preparations at the property adjacent to the raw water pipeline portal on SE Lusted Road. Significant modification to the property was completed to accommodate heavy equipment, construction materials, and construction traffic. This disturbance has inherently impaired natural resources since the start of construction activity, including surface water, wetlands, and associated wetland habitat. Site preparation resulted in the removal of at least 24 trees (> 6 inches in diameter) and an undetermined loss of existing shrubs. Contrary to Winterbrook's report on habitat survey results that were conducted on October 19, 2021 (Exhibit G.1), a wetland features do exist on the affected properties (Figure 6). Exhibit G.1 nor any other evidence submitted into the record acknowledges the existence of the pond or wetland. With a *singular* survey completed in October, it was not possible for Winterbrook's environmental scientist to adequately determine seasonal changes in the landscape and wildlife

utilizing the area. This includes amphibian species that nest, breed, and rear in the surrounding wetland grasses in the late winter/early spring. Common amphibians to other wetlands in the area include but are not limited to: Northern red-legged frog, Pacific tree frog, rough-skinned newt, and salamander. Common wetland birds of the area include: Great blue heron marsh wren, common yellowthroat, Yellow Warbler, Rails, Coots, Cranes, Bald Eagles, and various waterfowl. Exhibit E.9 (pg 17) listed a variety of avian species known to utilize habitat in the raw water pipeline project area listed by U.S. Fish and Wildlife Service (USFWS) as "birds of conservation concern".

Furthermore, the habitat assessment in Exhibit G.1 entirely focused on the forested vegetation and forest habitat at the portal. Without an accurate wildlife habitat assessment and thorough inventory, PWB proceeded to classify the area as “degraded and consists of disturbed vegetation”, ignoring the wetland and the importance of the tall “pasture grasses” for amphibian habitat.

Construction and site preparation of the raw water portal has caused long-term damage to the wetland and forest habitat at the site that abuts the county’s designated SEC-h overlay (Figure 7). Negative impacts are widespread and include (but are not limited to):

(i) An unknown quantity of trees have been cleared, including decades old Douglas fir, Western red cedar, and bigleaf maple;
(ii) Contractors have filled, leveled, and the graveled over of the property for vehicle access and construction material staging, thereby changing natural drainage patterns and infiltration;
(iii) Erosion control materials have modified natural flow into and out of the pond and surrounding wetlands
(iv) Newly constructed bridge over existing pond and wetlands for traffic access, potentially limiting breeding sites for amphibians and access for waterfowl



Figure 6. Property associated with raw water portal near 37077 SE Lusted Rd. before raw water portal staging construction (A) Street view of the entrance of impacted property (October 2023, *GoogleMaps*); (B) Existing wetland, associated wetland grasses, pasture and surrounding trees (February 2024).



Figure 7. Impacts at property associated with raw water portal near 37077 SE Lusted Rd. after raw water portal staging construction (photos taken February 2025) (A) Approaching pond with access bridge and concrete sound barrier; (B) Pond with erosion control material viewing from constructed bridge; (C) Pond-associated wetland with stream on other side of bridge; (D) Cleared deciduous trees prior to grading and gravel (Winter 2024/2025); and, (E) Current state of construction site entrance.

Irreparable Effects to Surface Water at the Finished Water Pipeline
Impaired Functioning Natural System: • Stream - Beaver Creek, Middle and North Fork
Site Preparation and Construction: ⇒ Altered topography resulting in change to natural overland flow and drainage within the middle fork of Beaver Creek ⇒ Increased sedimentation in middle fork Beaver Creek due to poor stormwater and erosion control methods ⇒ Altered topography and installation of impervious materials resulting in change to natural overland flow and drainage leading to flooding of agricultural resources
Ultimate Use – Underground Pipeline: ⇒ Altered topography resulting in change to natural overland flow and drainage at the middle fork of Beaver Creek

The filtration site is located less than a quarter mile from the north fork of Beaver Creek and approximately 1 mile from the middle fork of Beaver Creek. The finished pipeline route crosses existing farmland, crosses the middle fork of Beaver Creek, and also impacts the north fork of Beaver Creek (Figure 8). Beaver Creek is a tributary of the Sandy River (Figure 9), a federally designated Wild and Scenic River. Site preparations for the finished pipeline have included tree removal, soil movement and excavation, and grading. It is unknown to what extent PWB has implemented culverts or drainage control systems to direct overland flow and erosion. Figure 10 provides evidence that current systems are inadequate and inefficient. Therefore, overland flow is leaving the site, east flowing and downhill on SE Lusted Road, subsequently entering the north fork of Beaver Creek. Uncontrolled runoff is thereby adding increased sedimentation into Beaver Creek.

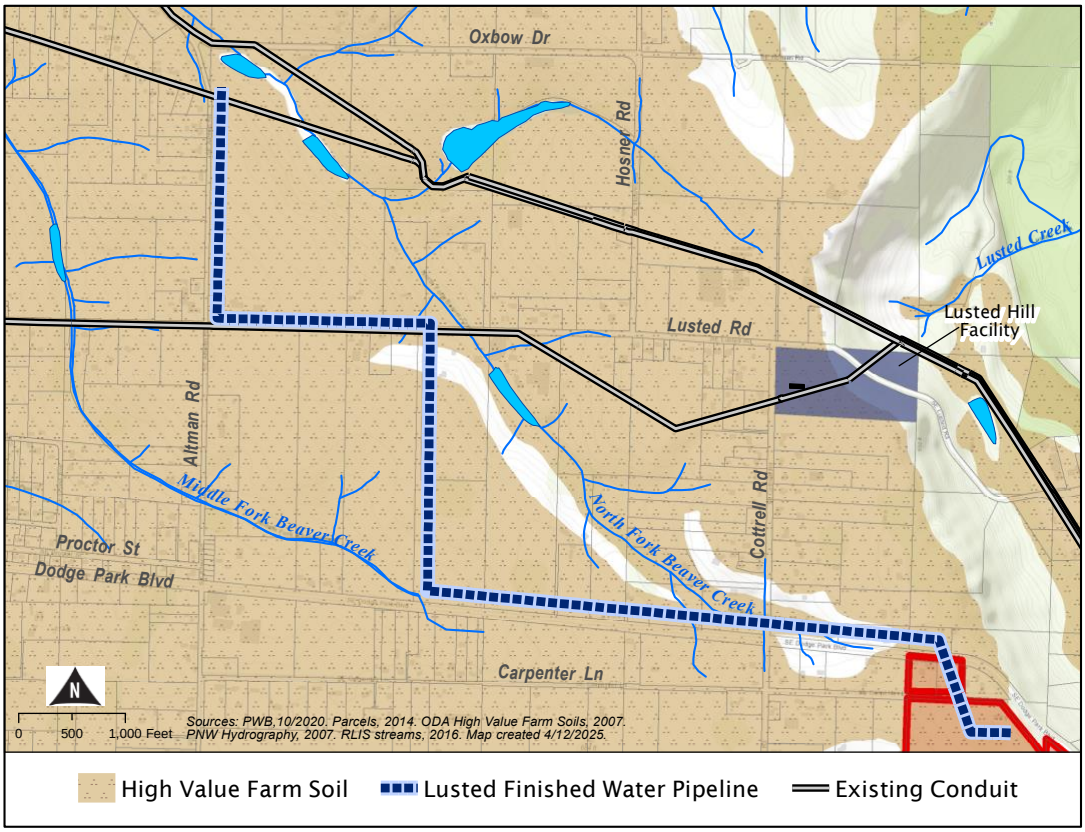


Figure 8. Finished pipeline route (*blue hashed line*) crosses existing high value farmland from SE Dodge Park Blvd northerly to SE Lusted Road. Pipeline route impacts both the middle fork and north fork of Beaver Creek.

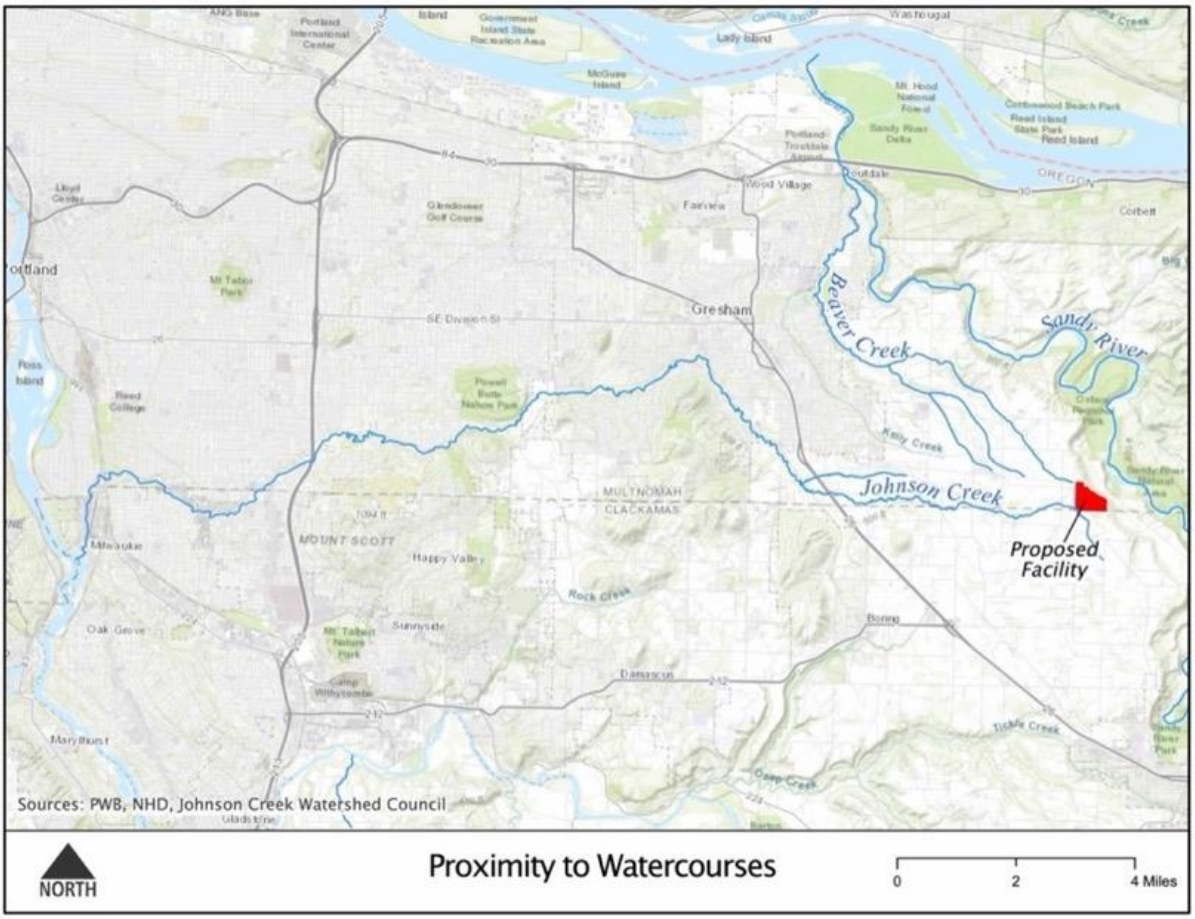


Figure 9. Proposed filtration facility location in relation to the nearby waterways of Beaver Creek, Johnson Creek, and the Sandy River.



Figure 10. Area's lack of stormwater drainage infrastructure results in poorly controlled overland runoff and drainage negatively impacting residences and farms on SE Lusted Rd and the north fork of Beaver Creek (*photo credit: Guy Meacham*)[2]. (A) Muddy runoff with ineffective storm water control (i.e., hay bales) at the construction staging for the finished water pipe route at 33444 SE Lusted Rd; (B) Runoff draining and directed from staging area, headed east and downhill toward Beaver Creek; (C) Runoff directed into residence (33608 SE Lusted Rd) adjacent to Beaver Creek, and downhill from staging area; and, (D) Runoff entering north fork Beaver Creek (*red arrow*) from residence at 33608 SE Lusted Rd.

The new easement road along the finished pipeline route is also negatively impacting farm operations and agricultural resources in a significant way. When the recent rainy season began in the fall of 2024, Surface Nursery experienced extreme impacts of the new PWB access road and altered landscape. To control dust and erosion, PWB implemented measures that included the installation of heavy impervious materials and silt fencing. As a result, significant flooding occurred (and continues to occur) during rain events (Figure 11). According to Surface Nursery[3], operators (including the neighboring farm, Ekstrom Nursery) experienced unprecedented flooding causing the inability to operate and access farmland, destruction of seedlings, and unworkable soils for farming (Figure 11B).

[2] Photos taken during February and March 2025.
[3] Personal communication, Dianne McGown, Surface Nursery, November 2024.

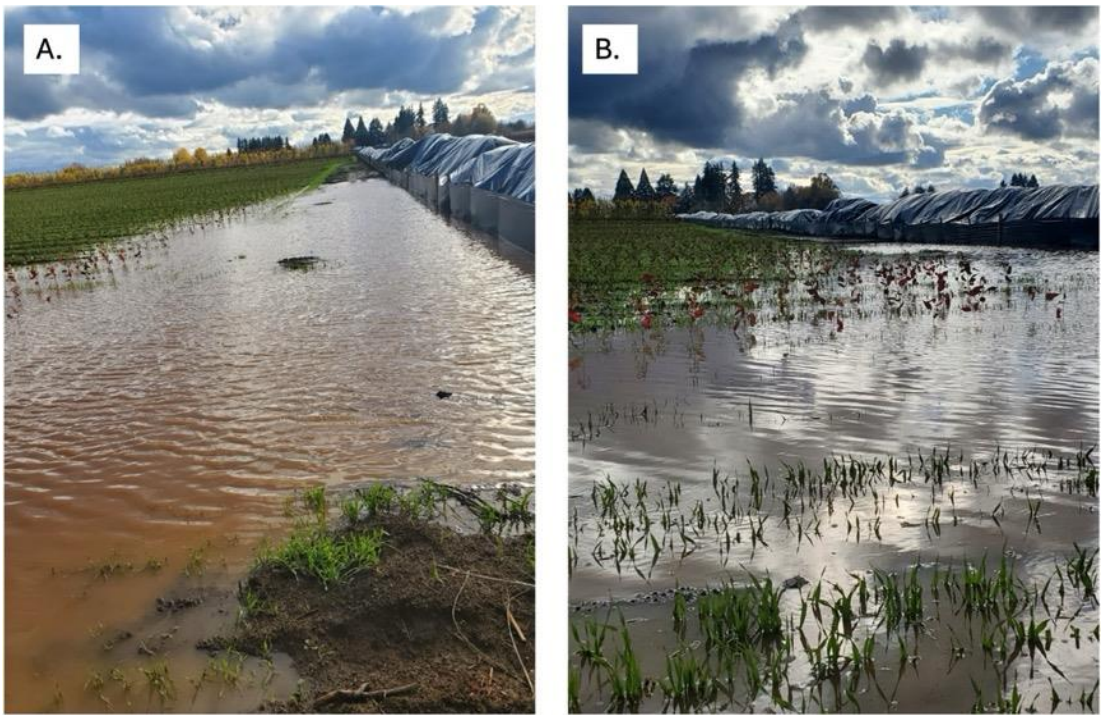


Figure 11. Significant negative impacts of altered landscape and erosion control measures on agricultural resources and existing farmland in fall of 2024 (*photo credit: Surface Nursery*). The location captured in the photos are along the finished pipeline route between SE Dodge Park Blvd and SE Lusted Road. (A) Excessive flooding of Surface Nursery property following fall rain events causing inaccessibility for farm operators; and (B) Flooded field of newly planted nursery stock saplings.

Groundwater Pumping into Johnson Creek

In the winter of 2025, residents observed a substantial volume of water being discharged into Johnson Creek following several days of dry weather (Figure 12). Upon inquiry, the onsite foreman for Kiewit, Mr. Goldschmidt, explained that groundwater was being pumped from the construction site into the creek at a rate of approximately 1 million gallons per day, or 3-4 cubic feet per second (cfs) over a typical 11-hour workday. This operation was occurring daily and was expected to continue as long as groundwater infiltrated excavated sections of the construction site. In short, PWB is using Johnson Creek like a cannel instead of respecting it as a natural waterway. It should be noted that this section of Johnson Creek is designated by the County as an area of Significant Environmental Concern.

The headwaters of Johnson Creek typically experience flows ranging from 1-10 cfs. Rapid fluctuations in stream flow, such as those caused by PWB's groundwater pumping activities, can have significant ecological consequences for fish, macroinvertebrates, and amphibians. These impacts stem from changes in flow dynamics, water temperature, dissolved oxygen levels, and potential shifts in water chemistry. Unfortunately, PWB and its contractors appeared to be unaware of these effects. When neighbors raised concerns with foreman Goldschmidt, he

remarked that the groundwater discharge was “good for the creek,” revealing a startling lack of understanding of stream ecology and the potential risks of sudden, unnatural flow changes.

Fish species in small creeks are adapted to natural flow variations, and the sudden daily influx of water caused by human activity can disrupt their habitat. For example, if the groundwater is significantly colder or warmer than the creek water, rapid temperature shifts could stress fish, affecting their metabolism, feeding behavior, and reproductive cycles. Additionally, sudden increases in flow alters sediment transport, potentially displacing eggs or reducing habitat quality for juvenile fish.

Macroinvertebrates, such as aquatic insects, are highly sensitive to changes in flow and water chemistry. The daily fluctuation in discharge may lead to habitat instability, particularly for species that depend on consistent substrate conditions. Increased flow could also wash away smaller, less mobile macroinvertebrates, reducing overall biodiversity and disrupting the food web.

Amphibians, particularly those with aquatic larval stages, depend on stable water conditions for survival and development. Rapid, daily fluctuations in flow may strand eggs or larvae, disrupt breeding sites, or alter water temperature in a way that impacts development. Amphibians are also sensitive to changes in dissolved oxygen and potential shifts in pH or pollutant levels that may accompany groundwater inputs. If groundwater contains contaminants or has significantly different chemical properties than the creek water, this would negatively impact amphibian populations.



Figure 12. Overland flow of groundwater pumped from the filtration construction site and directed into Johnson Creek. (*Photo credit: Jennifer Hart; January 30, 2025*). (A) Approximately 1,600 gallons per minute, or 3-4 cfs, is being pumped into Johnson Creek on workdays (6 days per week), 10-11 hours per day, suddenly increasing and decreasing stream flow on a regular basis. (B) Excessive discharge of significant volumes of water creates channelization and sediment transport into Johnson Creek (*see white arrows*) negatively impacting the riparian habitat and the naturally occurring water quality conditions of the creek.

Groundwater resources

Depth to Groundwater and Direction of Groundwater Movement

Our review of boring logs associated with the Portland Water Bureau's Filtration Facility project near SE Carpenter Lane in Gresham reveals key insights into the area groundwater conditions. The depth to regional groundwater was observed in borings drilled within the main Plant property. These borings show static water levels measured between approximately 24 and 31 feet below ground surface (bgs). It appears that these static wells reflect the highest regional groundwater depth within the main Plant area typically occurring within more permeable layers of sand and gravel that underlie finer-grained, less permeable materials.

Locally groundwater, perched above the regional groundwater, appears to exist at much shallower depths (between 3 and 4 feet). Several borings encountered wet/saturated conditions in upper soil layers, particularly in fine-grained units such as silt (ML) and fat clay (CH) above more permeable soils found deeper. These shallow water levels likely represent perched conditions, where water accumulates above clay-rich soil horizons due to limited vertical permeability.

Within the main Plant site, the estimated flow direction of the regional groundwater is presumed to generally follow surface topography and natural drainage patterns—east to west toward Johnson Creek. Within the raw water pipeline alignment, we assume that groundwater flow direction generally follows ground surface topography, which generally slopes down to the east and southeast. This direction aligns with broader hydrogeologic studies and the characteristics of valley-fill alluvium common in the Gresham area. On the other hand, perched groundwater flow is expected to be localized and variable, likely moving downward and laterally along the interfaces between finer- and coarser-grained layers until it either discharges to the surface or reconnects with the regional water table at depth.

Neighboring Water Wells

PWB's proposed project is situated in a rural area where many properties rely solely on domestic groundwater wells for drinking water, irrigation, and household use. Within 1,000 feet of the pipeline corridors and excavation zones, thirteen domestic wells have been identified, including the Walter Well and the Courter Well, which are located approximately 500 feet east of the tunnel portal. These two named wells are the most proximate to the vertical shaft and other major excavation activities at the main Plant.

The owners of the Walter Well reported changes in water quality and quantity, including sediment, reduced pressure, and/or pump cycling issues following drilling conducted nearby by PWB for geologic testing. The PWB finally accepted responsibility and drilled a replacement well in 2021, but the process was slow, uncoordinated, and left the homeowner without water for an extended period. This incident highlights the sensitivity of these neighboring wells to drilling activity on the PWB property and validates community concerns about the PWB's adverse impacts on wells in the area. When asked to provide assurances that wells would not be impacted, PWB engineers suggested that residents file a complaint with the PWB if they notice a change in water supply. This response reveals a surprising lack of understanding about how the project could impact water resources.

Table 1 provides a summary of nearby wells, including well ID numbers, owner names, and available static depth data. Figure 13 shows the mapped locations of these wells relative to project features. The table includes long-term local residents and a mix of well depths, with some wells, such as the Dugger well, as shallow as 50 feet—making them particularly vulnerable to construction-related disturbance such as Plant well dewatering, and Plant and pipeline excavation and blasting.

Table 1. Nearby wells (See Figure 13 for location by number)

WELL MAP #	ID	TYPE	OWNER	STATIC DEPTH (FEET)
1	15797	Water Well	ROGER BARTH	150
2	487604	Water Well	ARNOLD HEIMAN	397
3	351300	Water Well	PAUL BUSS	386
4	12315	Water Well	BILL L DUGGER	50
5	12382	Water Well	MARV BEHRENS	200
6	454366	Water Well	DOUG DAVIDSON	201
7	12368	Water Well	ROBERT W HAWORTH	260
8	12206	Water Well	DAVE LETTERMAN	139
9	34198	Water Well	RAY KAYS	160
10	35490	Water Well	ROBERT PITTS	165
11	224158	Water Well	NEAL BUND	150
12		Water Well	COURTER	
13		Water Well	WALTER	

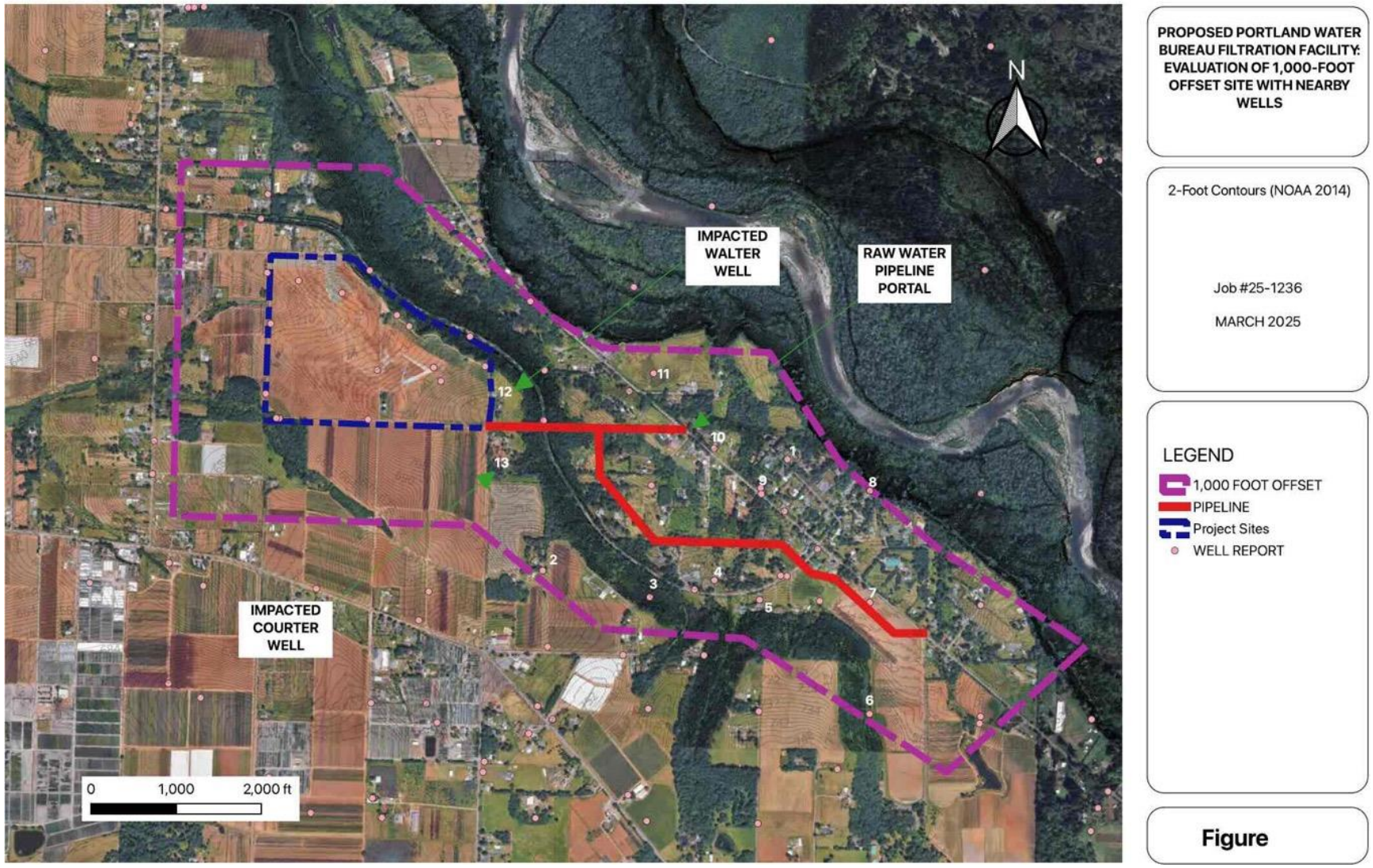


Figure 13. Map of domestic wells proximate to the proposed facility.

Groundwater Impacts

A central concern associated with the Filtration Facility project is the potential for significant and potentially irreversible impacts to nearby residential groundwater wells caused by deep excavation, tunneling, dewatering, and groundwater discharge. Construction of the plant is already underway, including excavation of large detention basins and a vertical shaft up to 217 feet deep. Although construction has been temporarily paused, the potential effects on the surrounding groundwater system remain a key issue.

Despite the scale of excavation and the sensitivity of the hydrogeologic setting, no formal hydrogeologic impact assessment has been publicly released by PWB or its consultants. This absence of documentation is concerning—especially considering anecdotal evidence from nearby residents who have observed changes in water yield and quality since construction began. Without verified baseline data or transparent ongoing monitoring, it is difficult to confirm whether these effects are directly caused by construction activities. However, the risk that dewatering or blasting could alter groundwater flow paths, lower the water table, or introduce sediment or contaminants into well systems remains very real.

Additionally, Plant dewatering wells are extracting groundwater and discharging it to Johnson Creek. During construction dewatering wells could lower regional groundwater, affecting shallow or perched aquifers and deeper aquifers that feed water to private wells. Given these concerns and other concerns discussed in this report, a more robust, transparent, and independent groundwater assessment is urgently needed.

Minimally, PWB should fund a comprehensive groundwater monitoring program to study the potential for well impacts both during and after construction. The work should be conducted by an independent consultant with the appropriate expertise and no previous business ties to PWB. Monitoring should include consideration of static water level measurements, drawdown testing, turbidity and water quality sampling, and the installation of monitoring wells near high-risk zones. Without this work, the PWB cannot verify that it can meet the Conditional Use Criteria. Moving forward with the project and trying to lessen or mitigate the impact after harm has already been done does not align with the intent of County policies, which are designed to prevent harm before it occurs.

In the absence of a thorough assessment, nearby residents remain vulnerable to unmonitored and potentially permanent changes to their domestic water supply. Ensuring protective measures are in place is not only responsible planning—it is also necessary to comply with Multnomah County Conditional Use Criteria MCC 39.7515(B), which prohibits adverse impacts to natural resources, including groundwater.

Air

Irreparable Effects of Filtration Facility and Pipeline on Air Quality
Impaired Functioning Natural System: • Air Quality Regulating System • Air Quality Supporting Ecosystems
Immediate and Ultimate Use Impacts: ⇒ Destabilization of area's air quality maintenance system, moving from *carbon sink* to *carbon source* ⇒ Loss of supporting ecosystem: nutrient cycling and photosynthesis

Farmland acts as a natural carbon sink (when managed sustainably) due to crop density and well-managed soils. A carbon sink is something that absorbs more carbon dioxide (CO_2) than it gives off (see proceeding equation), helping to reduce greenhouse gases in the atmosphere. Omission and fragmentation of farmland, leads to more CO_2 in the air, contributing to climate change. When farmland is replaced by industrial development, the CO_2 equation flips, and the ecosystem no longer benefits from the carbon sink; industrial development increases carbon emissions. Carbon sinks are vital to support ecosystem resilience and biodiversity by curbing greenhouse gases.

$$C_{in} - C_{out} = C_{stored}$$

Where,

C_{in} = Carbon absorbed (e.g., by crops, farmland soil)

C_{out} = Carbon released (e.g., by industrial emissions)

C_{stored} = Net carbon stored

Therefore, nursery stock cultivation on the 90+ acre parcel served as a carbon sink ($C_{in} > C_{out}$). Impervious surfaces and facility-associated carbon emissions from the ultimate use facility forces the existing land to switch to a carbon source ($C_{in} < C_{out}$).

Soil

Irreparable Effects to Soil at Filtration Site
Impaired Functioning Natural System: • Stream Habitat - Beaver Creek, Middle and North Fork • Stream Habitat – Johnson Creek • River Habitat – Sandy River
Site Preparation and Construction: ⇒ Overland flow of unstable surfaces increase the risk of erosion causing high sediment negatively impacting stream habitats across filtration and pipeline sites ⇒ Increased landslide risk from boring and blasting at steeper slopes that have existing moderate to high landslide risk
Ultimate Use: ⇒ Increased slope instability and landslide risk at steeper slopes that have existing moderate to high landslide risk

Erosion

At the native pre-construction ground surface, a thin layer of topsoil or cultivated zone is typically present, likely consisting of moist to wet, dark brown silt (ML) with organic matter and rootlets. Beneath this layer, wind-deposited loess (Ql) is commonly encountered in the area. This silt- and fine sand-rich unit, deposited by strong easterly winds following the Missoula Floods, typically ranges 2 to 6 feet in thickness. The loess is massive, unstratified, and lightly indurated/compacted (i.e., lower density). These soils are highly moisture-sensitive, displaying competent strength when dry but rapidly losing strength when saturated. Consequently, they are susceptible to erosion, piping, and shallow sloughing, making them problematic for use in slopes, shallow foundations, and unprotected excavations (e.g., Figure 14).

According to the U.S. Department of Agriculture (USDA)-Natural Resource Conservation Service (NRCS), the predominant surface soil is Cazadero silty clay loam (0 to 8 percent slopes) and covers about 30% of the area. This soil has a relatively high T value (tolerable soil loss) of 5 tons per acre per year, underscoring the erosion sensitivity of the native silty clay soils. In combination with loess deposits (particularly within the main Plant area) and steep topography and mapped landslides (to the east of the main Plant and along the raw water pipeline), this creates a high potential for surface erosion and sedimentation.

Given the soil type, there is a high potential for erosion. During construction, there have been multiple observations of channelization and erosion proximal to Johnson Creek. Erosion has also been observed on the mound of the ~600,000 CY of excavated soil at the southeastern portion of the property (Figure 12), which is likely attributed to the high volume of excavated loess and Cazadero silty clay loam concentrated in one location.



Figure 14. Example of erosion occurring at PWB's construction site.

Slope Stability and Landslide Risk

Geologic Setting: The subsurface conditions within the vicinity of the proposed Filtration Plant consist of a layered sequence of soil and rock materials resulting from surficial deposition, regional volcanic activity, and glacial or fluvial reworking. The stratigraphy reflects complex depositional histories typical of the region.

The project site is located near SE Bluff Road and SE Stone Road in Sandy, Oregon, on a prominent bluff overlooking the Sandy River valley. The regional terrain reflects a dynamic geologic history shaped by volcanic activity, glacial outburst flooding, fluvial erosion, and wind deposition. This bluff marks the edge of an elevated terrace left behind as the Sandy River migrated eastward and incised into older floodplain sediments and volcanic deposits. During the late Pleistocene, the Pacific Northwest experienced numerous catastrophic flood events known as the Missoula Floods. These glacial outburst floods carried immense volumes of water and sediment through the Columbia River Gorge, depositing thick sequences of gravel, sand, silt, and clay. While the project site lies west of the main flood path, fine-grained sediments from these events were redistributed by easterly winds and deposited across the region as loess. These deposits form the modern surficial soils found at the site and throughout the elevated bluffs in the Sandy area. Following the floods, continued fluvial incision by the Sandy River carved steep-walled canyons and left behind a series of river terraces. The project site is located on one such terrace, approximately 2,500 feet west and 230 feet above the modern river channel. The long-term erosion of the bluff face, combined with periodic slope failures and toe undercutting, has created a highly variable and geomorphically active landscape.

The subsurface stratigraphy is also influenced by the Boring Volcanic Field, a zone of Quaternary-aged volcanic activity in the Portland Basin. The resulting deposits include lahar and debris flow materials consisting of andesitic and basaltic gravel, cobbles, and boulders in a fine-grained matrix. According to mapping by the Oregon Department of Geology and Mineral Industries (DOGAMI), the site is underlain by a thin veneer of loess (Ql) over older gravel of Boring Lava origin (QTca) (Burns and Madin 2009; Madin et al. 2006). This layering of fine-grained loess above coarse volcaniclastic gravel represents a stratigraphic contrast that strongly influences groundwater flow, erosion susceptibility, and slope stability. Additionally, the Statewide Landslide Information Database for Oregon[4] (SLIDO-3) (Figure 15) identifies mapped landslides and a scarp feature immediately southeast of the site, further emphasizing the area's history of mass-wasting events and its geotechnical sensitivity (SLIDO 2021).

Geologic Hazards: Landslide risks can exist, particularly on steeper slopes. State mapping from the SLIDO (Statewide Landslide Information Database for Oregon) was developed to guide development planning and compel developers to conduct site-specific study to refine SLIDO's assessment of landslide risk and, if needed, site-specific mitigation if these risks potentially impact a property and surrounding properties.

SLIDO shows steeper slopes to the east and northeast of the main Plant site. These steeper slopes also exist to the southeast of the main Plant along the raw water tunnel under construction. Tunnel construction will involve blasting with explosives. Area topography is shown on both Strata-generated figures.

SLIDO shows mapped landslide scarps (i.e., arc-shaped topography remaining after landslide failure) locations in the areas of steeper slopes noted above. Although not shown on Figure 15, downslope of the scarps there are also oblong-shaped topographic features suggestive of disturbed slide debris. Based solely on the steepness of the slopes near and within portions of the Plant, SLIDO maps indicate that there is a moderate to high landslide hazard (not shown on Figure 15) to the east of the main Plant and within the area of the raw water pipeline.

Based on specific geologic mapping (Burns and Madin, 2009; SLIDO 2021) and State review of other data, the SLIDO map (Figure 15) identifies the landslide scarps and debris flows below the scarps "historic" movement (i.e., estimated movement last occurred within the past 150 years). The larger mapped slide shown further down slope to the north and SE of the Plant on Figure 15, are considered by SLIDO to have moved in ancient times. Based on geologic conditions and our review of the Plant site and nearby properties, these features are typically associated with rotational and translational failures along the contact between the loess and underlying gravels or bedrock, or within zones of weakened, saturated silt/clay.

Several factors contribute to landslide susceptibility in this area. The steep slope gradients, which in some cases exceed 50 percent, significantly increase the driving forces acting on slope materials. The presence of weak, fine-grained loess overlying coarser, pervious gravels or expansive clay creates discontinuities that can act as slip surfaces. Groundwater fluctuations, particularly during wet seasons or after snowmelt events, reduce effective stress in slope materials and increase the risk of failure. Additionally, erosion of the toe of the slope by the

[4] https://gis.dogami.oregon.gov/maps/slido/

Sandy River—either historically or during high-flow events—can remove support at the base of the slope, leading to retrogressive failure. The risk is further elevated under seismic loading, particularly from the Cascadia Subduction Zone, which could rapidly reduce slope stability.

Field observations and regional datasets indicate shallow scarps, hummocky topography, and uneven drainage patterns—common indicators of previous or incipient slope movement. Based on the mapped conditions and site geology, the development area, particularly proximal to the raw water alignment/portal, should be considered potentially unstable.

To our knowledge, PWB has not conducted a detailed slope stability analysis, including field borings, shear strength testing, and groundwater monitoring. Long-term stormwater management is also a concern, as uncontrolled surface water may exacerbate instability or initiate shallow slides.

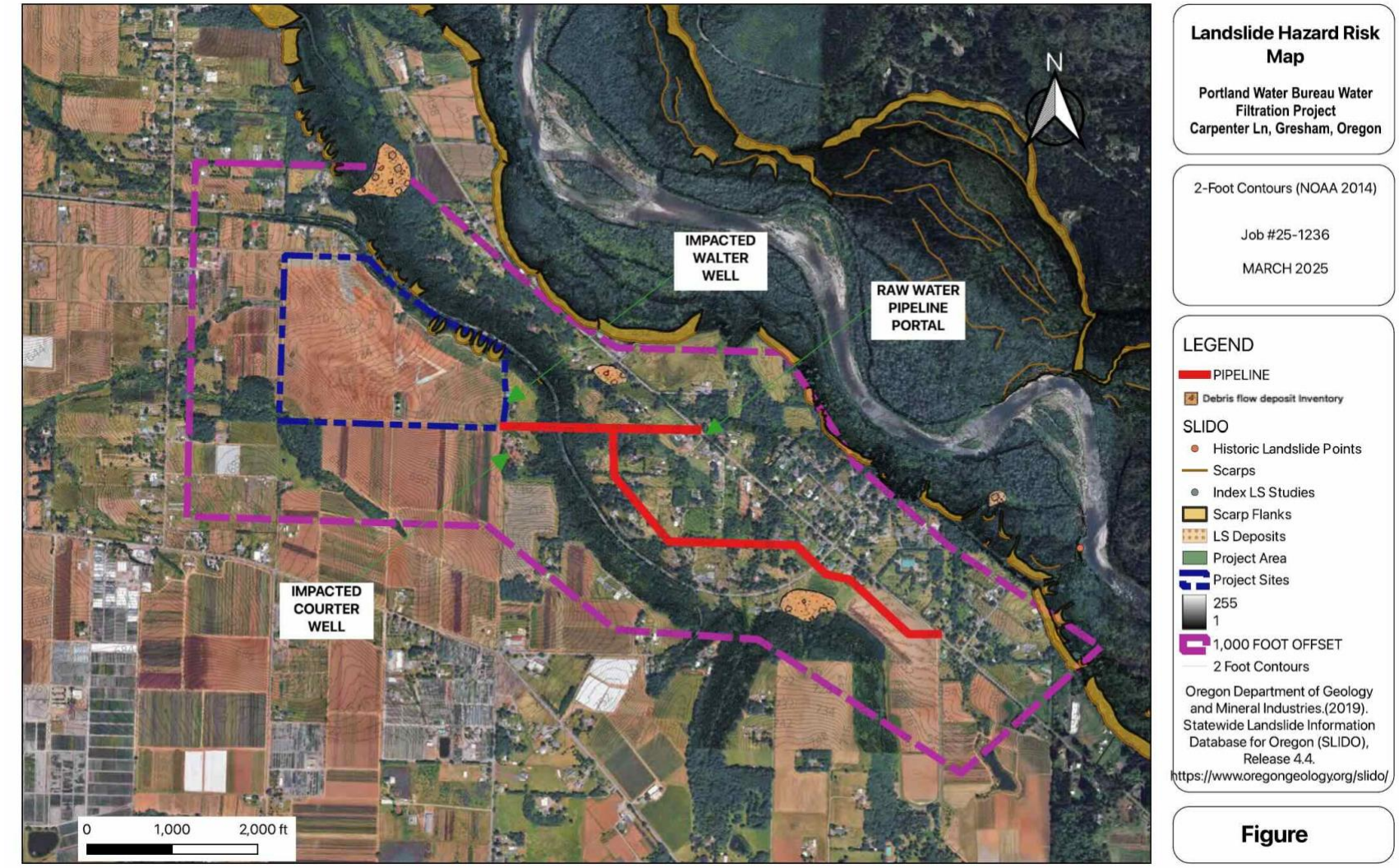


Figure 15. Map of proposed facility and local geologic features, including historic landslides.

Offsite Soil Relocation and Erosion

The environmental impacts of the Portland Water Bureau's (PWB) activities extend far beyond the immediate construction sites of its project components. Two significant areas affected by these activities, both owned by T&K Sester Farms LLC, include the Gramor property in Clackamas County and the Oxbow property in Multnomah County.

Gramor Property: Contaminated Soil Disposal

The Gramor property, a 29-acre agricultural site, was designated to receive 125,000 cubic yards of excavation spoils from the Filtration Facility site, soils contaminated with DDT, DDE, and Dieldrin. Despite PWB and the Department of Environmental Quality (DEQ) referring to the soil as only slightly contaminated, DEQ required a Tier 2 Beneficial Use Determination (BUD), a classification used for solid waste containing hazardous substances at significantly higher concentrations than comparable raw materials or commercial products.

An Environmental Risk Assessment showed that soil samples from the PWB project site contained DDT, DDE, and Dieldrin levels five to eight times greater than DEQ's thresholds for clean fill. DDT and Dieldrin, banned in the U.S. since the 1970s, are known for their persistence in the environment and their detrimental effects on wildlife, particularly birds. Both chemicals are classified as probable or likely human carcinogens, with Dieldrin also linked to liver damage, immune system suppression, and reproductive harm in animal studies.

PWB was aware of the presence of these contaminants as early as 2019, based on samples collected and analyzed by Assessment Associates. However, it failed to disclose this information in its land use applications submitted to Multnomah County. Had this contamination been revealed, it would have likely drawn significant public scrutiny and regulatory attention.

Despite concerns raised by the Oregon Department of Agriculture (ODA), which explicitly stated that the placement of this fill was not considered an agricultural activity, PWB proceeded to transport and deposit the contaminated soil at the Gramor property during the wettest months of the year. This created a high risk of uncontrolled movement of contaminated sediments. DEQ required that the contaminated soil be covered with 1.5 feet of virgin soil and blended through discing to minimize risk. Instead, contaminated soil was dumped into excavated pits, some filled with water, and simply covered—without the required mixing.

DEQ eventually acknowledged that the soil was not handled as required but failed to take corrective action. A January 2025 email from DEQ staff indicated that mixing would be conducted in the spring, yet this expectation ignored the reality that the failure to blend the soils had already invalidated the Environmental Risk Assessment's conclusions. Under the terms of the BUD, failing to comply with its conditions should have resulted in revocation and a requirement that the soil be disposed of at a DEQ-approved landfill. However, no such action was taken. DEQ also issued a Pre-Enforcement Notice (PEN) to T&K Sester Farms for stormwater violations but did not hold PWB accountable, despite its role as the responsible party for BUD compliance.

Oxbow Property: Unpermitted Clearing and Environmental Damage

The “Oxbow property” is located on the crest of the Sandy River Canyon, which is both a designated Oregon Scenic Waterway and a federally recognized Wild and Scenic River. The site includes state-regulated wetlands, a perennial stream, and areas classified as significant environmental concern. An agreement was established between the property owner and the City of Portland to use the Oxbow property as a fill site for spoils from the future water filtration project.

In November 2022, a complaint was filed with Multnomah County Land Use and Planning regarding unpermitted clearing, grading, and partial filling of 10.75 acres of the Oxbow property.

The landowner had applied for an agricultural fill permit to deposit 1.9 million cubic yards of excavation spoils from the filtration project to develop a "can yard" (a flat graveled area for containerized plant propagation). Though Multnomah County denied the permit, the circuit court ultimately required its issuance due to missed statutory deadlines. Following additional complaints, the Department of State Lands (DSL), DEQ, and ODA investigated and issued a Pre-Enforcement Notice in August 2023 for Class 1 violations[5]. These violations included the destruction of the headwaters of a perennial stream and its associated wetlands, resulting in pollution of state waters (Figure 16).

Despite this notice, DEQ failed to enforce corrective measures, allowing severe sediment erosion that continued through 2024 and currently continues. In December 2024, DEQ reissued the Pre-enforcement notice (PEN) but provided no details on potential enforcement actions, while the landowner continued pursuing approvals to proceed with the fill.

ODA confirmed that the clearing and proposed fill were not part of a common and accepted agricultural practice. Agency reports documented significant erosion on steep slopes, with *hundreds of cubic yards of soil displaced into the Sandy River*. DSL's February 2024 assessment determined that previous work did not qualify for agricultural exemptions and identified extensive unauthorized impacts to regulated wetlands and waterways. PWB failed to disclose its intent to dispose of excavation spoils at this sensitive site during public land use proceedings.

Summary Soil Relocation Impacts

- PWB was aware of contaminated soils at the Filtration Plant site in 2019 but failed to disclose this information in land use applications.

[5] DSL WD2024-0685. Prepared by Evren Northwest, 12/20/24, page 9. "*The property remained fallow until late 2022 or early 2023, when it was cleared and prepared for receiving soil from the Portland Water Bureau’s planned infiltration facility. Channelization visible on the 2023 aerial photograph appears as erosional rills in the recently disturbed soils along the bottom of the swale. Drainpipe was placed in the major rills, covered by soils, and the swale was planted and covered with straw in 2024, ready again for soil placement*."

- PWB transported and deposited 125,000 cubic yards of contaminated soil nine miles away at the Gramor property against expert recommendations and without proper erosion control measures in place (Figure 17).
- DEQ issued a Pre-Enforcement Notice to the landowner for stormwater violations but failed to hold PWB accountable for mismanaging the contaminated soil.
- The contaminated soil at the Gramor site was not properly blended as required by the Environmental Risk Assessment, voiding its conclusions and regulatory compliance.
- PWB failed to disclose its intent to dispose of 1.9 million cubic yards of excavation spoils at the environmentally sensitive Oxbow property, leading to severe erosion and habitat destruction.
- Despite multiple regulatory violations and enforcement notices, DEQ failed to take meaningful action against either the landowner or PWB.
- During early stages of the excavation of pre-existing topsoil, dust (containing agricultural use related contaminants) was generated and impacted surrounding neighbors.

The continued environmental degradation at both sites demonstrates significant regulatory failures and a lack of accountability on the part of PWB. Below are photographs documenting the ongoing stormwater runoff, erosion, and contamination at these sites.

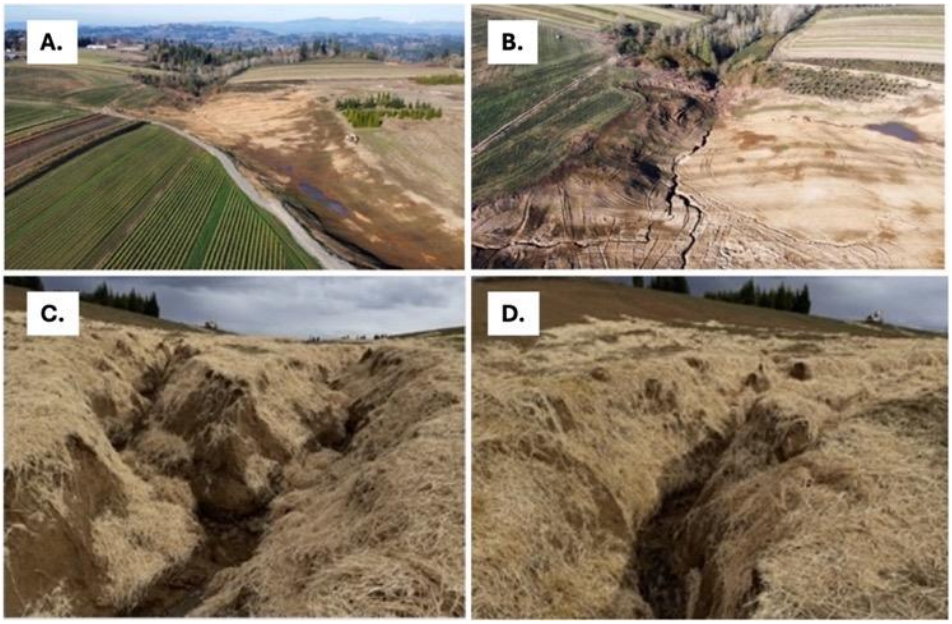


Figure 16. Photos taken in November 2022 at the Oxbow property documenting erosion at the site and mobizing directly into the Wild and Scenic Sandy River. (A, B) Extensive erosion and channelization; (C, D) Bare loose soils surrounding extreme channel incision that is 4 feet deep and 3 feet wide[6].

[6] Oregon Department of Agriculture. Agricultural Water Quality Management Program – Compliance Investigation Report, Case #23-0034 – CI#1 – SAT & K Sester Family LLC, page 26. October 23, 2023.



Figure 17. Photos taken by DEQ on 12/27/24 at the Gramor property on SE Highway 212 documenting uncontrolled runoff from contaminated soils deposited at the site.

Birds, Mammals, and Pollinating Insects

Irreparable Effects to Wildlife at Filtration and Pipeline sites
Impaired Functioning Natural System: • Foraging and migratory habitat for mammalian wildlife, include large game. • Nesting and foraging habitat for resident and migratory avian species
Site Preparation and Construction: ⇒ Construction activity changes migratory patterns and nesting of mammalian and avian species ⇒ Clearing and fragmenting avian habitat (i.e., agricultural lands, hedgerows)
Ultimate Use: ⇒ Decreased habitat diversity ⇒ Modified landscape and habitats yield a shift in the flora, thereby changing the complexion of avian and mammalian assemblages

Goal 3 of Oregon's Statewide Planning Goals, the Exclusive Farm Use Zone (EFU) emphasizes the importance of preserving and protecting agricultural lands for providing natural resource values. Reference to wildlife habitat can be found in the Oregon legislature's founding Land Use Law (Senate Bill 10) in 1973. Natural resource values, including fish and wildlife habitat, were recognized as a component of Goal 3 and Goal 4 resource lands. Wildlife having special status such as Threatened, Endangered and Sensitive species were additionally recognized as Goal 5 Resources. Counties were given additional flexibility to identify Multi-purpose Agricultural lands allowing for small farms, some residential development and community scale service

projects. Multi-purpose zoned lands also contribute significant fish and wildlife habitat primarily due to their rural nature, crop diversity and contribution to habitat diversity.

Specific criteria have been established that allows change of land use designation for Farmland Exclusive Farm Use (EFU), Multi-purpose lands (MP-20) or Forest Lands (Goal 4). The criteria state that there will be “no adverse affects to natural resources” as a result of a proposed land use change.

In our assessment, we considered wildlife resource values associated with the site when it was in agricultural production prior to the degradation and loss of wildlife habitat resulting from construction of the facility. Mitigation actions were found to be inappropriate and inadequate for replacing natural resource values impacted to date. Furthermore, mitigation actions are not recognized as a solution to adverse effects, since the language is clear that the action will not cause adverse effects on natural resources.

The Portland Water Bureau has caused significant adverse effects to wildlife resources and their habitats and migration corridors by eliminating a large piece of farmland, cutting down hundreds of mature trees, and grading over wetlands. Examples of local wildlife that utilize habitats impacted by the filtration project, and raw and finished water portal are shown in Figure 18, Figure 19, and Figure 20.



Figure 18. Photos of resident and migratory mammals near the raw water portal, filtration facility, site, and Johnson Creek. Black bear, cougar, deer, coyote, bobcat, elk, and beaver are regularly seen. The Wild and Scenic Sandy River is a federally-protected migratory corridor for species such as Roosevelt elk (two bottom right tiles). Animals migrate through the Sandy River canyon and regularly forage at residences and farms near SE Lusted Rd and SE Dodge Park Blvd. All photos were previously submitted into the Multnomah County record in 2023 except the river otter photo (upper right tile). The river otter was photographed in 2025 from a resident who lives at the headwaters of Johnson Creek. These are just a few of the hundreds of wildlife photos collected from local residents during development of this report.



Figure 19. Resident and migratory bird species observed adjacent to Johnson Creek headwaters. From left to right: red-breasted nuthatch, varied thrush, black-capped chickadee, grosbeak, red-winged blackbird, northern flicker, downy woodpecker, bushtits.

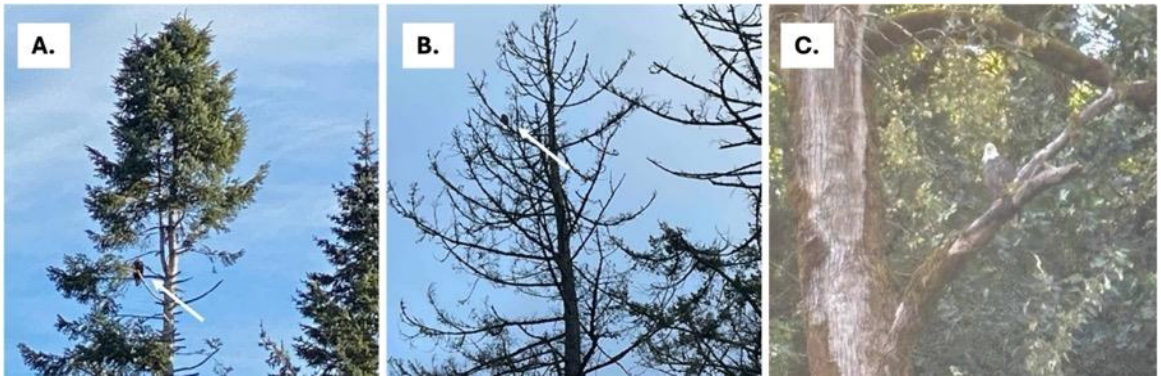


Figure 20. Representative photos of birds of prey regularly observed at and near filtration site and raw water portal. (A) Bald eagle perched in nearby Douglas fir; (B) Perched resident red-tailed hawk on tree on filtration site (tree was cleared for site preparation); (C) Bald eagle perched in nearby cottonwood tree.

Agricultural Field

Nursery stock field conditions can vary significantly over time as crop rotations occur and cover crops are established between crops. The pre-construction conditions appear to have had several habitat features important to wildlife. These features have been lost as a result of the project.

Open or bare ground is a dominant feature in nursery stock fields and attracts several species of wildlife. Without seasonal surveys, it is not possible to determine which species were using this site. Review of the literature and based on my 20 plus years of habitat assessment and restoration experience, I identified several species of concern.

Streaked horned lark is a Federal and State bird of concern. This species nests on the ground in sparsely vegetated fields. They prefer fields with seasonal waterways and wetlands which provide abundant insect populations for foraging and feeding young. (USFWS 2025, personal communication) (OCS 2016).

Other ground feeding birds such as western meadowlark and western bluebird are ground foragers feeding primarily on invertebrates. Both species prefer open ground with sparse or low growing vegetation. While streaked horned larks and meadowlarks are ground nesting birds, western blue birds are secondary cavity nesters relying on trees large enough to provide natural or excavated nesting cavities. Many birds that winter in the Willamette Valley tend to migrate throughout the geographic area utilizing food and cover resources depending on weather conditions such as freezing cold and snow. These song birds can be observed moving in flocks throughout the winter. During this time, adult birds may "scout" the area for suitable spring nest sites.

The open ground attracts numerous pollinators (beetles, bees, butterflies) that prefer ground that is not annually cultivated. Wasps and bees may move up to several miles from their natal areas to seek nectar and prey. Their ability to travel longer distances a service to local producers needing crop pollination or insect control on vegetable crops. Bumble bees are important and recognized as contributing significant pollination critical for blueberry and clover crops (Rao, S. And W.P. Steven 2016).

Seasonal wetlands and waterways provide excellent habitats for invertebrate populations. These insects are essential food resources for birds and small mammals. Wetlands provide nectar and invertebrates for food late into the growing season when other food resources may become limited. Wetlands and waterways provide spring breeding sites used by red-legged frogs, chorus frogs, newts, and three-toed salamanders. These species provide examples of wildlife that need water for breeding and egg laying but spend most of their life as terrestrial species using adjacent woodlands or hedgerows for food and cover.

Species using the cropland may vary over time, but cropland has numerous intrinsic natural resource values. While most wildlife species are not currently considered Goal 5 resources, habitat conditions on this site reinforces the original basis for protecting agricultural lands. Wildlife populations depend on and thrive in managed croplands making forest and farm lands integral to sustainable wildlife populations.

Hedgerows and Field Edges

Irreparable Effects of Hedgerow Removal for Finished Pipeline
Impaired Functioning Natural System: • Bird, invertebrate/pollinator, and small mammal habitat
Immediate and Ultimate Use Impacts: ⇒ Irradication of migratory and resident bird breeding, nesting, and foraging habitat ⇒ Irradication of insects and pollinator habitat ⇒ Irradication of small mammal habitat, shelter, and cover ⇒ Removal of field borders for agricultural resources ⇒ Increased overland runoff

Hedgerows serve as high quality habitats (Figure 21). The hedgerow located along Dodge Park Boulevard was a significant natural resource in terms of wildlife habitat quality and quantity. Mature hedgerows are rare within the Willamette Valley landscape. Replacing the structure and function is unlikely within the next several decades. Oregon State Extension Service, the Natural Resource Conservation Service (NRCS) and Oregon Department of Fish & Wildlife (ODFW) encourage landowners to protect and enhance these declining habitats throughout Oregon. These agencies provide technical and financial assistance to agricultural producers with a goal of maintaining and increasing the distribution and quality of field borders, and hedgerows.

Forested field edges and hedgerows are known to modify winds, moderate air temperature, protect soils, improve water quality, and provide a diverse array of plants used by pollinators, birds and mammals. They also provide important linkages between farm ownerships which are used as dispersal corridors for many species ensuring biological and genetic diversity within wildlife populations. Removal of large conifers and hardwood trees significantly impacts resident and migratory birds and small mammals which depend on trees (>18 inch diameter) for cavities, food, and shelter from heat and cold. Replacing large trees is a long-term process and it may be 50-80 years before habitat quality is restored.

Beneficial insects, often referred to as pollinators, include numerous species of butterflies, wasps, moths, lady beetles, and ground beetles. Nesting and wintering pollinators seek shelter in hedgerows that offer protection from predators and the elements. Functional, high value habitat includes stems and branches of trees, shrubs, wildflowers, leaf litter, undisturbed ground, bare ground, dead wood, brush piles and rock piles. Pollinators and predatory insects often travel from natal and cover areas searching for pollen, nectar and food resources. This movement is beneficial to local agricultural producers that rely on insects to pollinate crops such as berries, fruit and nut trees. Retaining and incorporating as many hedgerow features as possible into the landscape (rather than “cleaning” them away) is recommended by OSU Extension, ODFW’s

Conservation Strategy, and the Natural Resource Conservation Service. Attracting and supporting a diversity of bees and other beneficial insects within the rural landscape can be essential to sustaining agricultural production.

Insect populations provide a diverse food resource for resident and migratory birds. Migratory birds, in particular, depend on high quality food resources during the winter and during the breeding and nesting season. Migratory birds expend vast amounts of energy during migration and must replace those resource in order to be successful in producing young capable of migrating several thousands of miles by fall. Examples of these migratory birds include the yellow bellied chat, yellow warbler, yellow crowned warbler, Audubon's warbler, warbling vireo and American goldfinch. Resident birds depend on hedgerow habitat in winter months for food and shelter from wind and cold. These include species such as the spotted towhee, scrub jays, robins, black capped chickadee, chestnut backed chickadee, American robins, and dark eyed junco.



Figure 21. Hedgerows are high quality habitats OSU Extension (2022), consisting of foliage similar to the former hedgerow on SE Dodge Park Blvd. Preconstruction hedgerow was an established habitat similar to this (see proceeding Figure 22)

As documented in Exhibit E. 9, the subject hedgerow (Figure 22) was diverse in tree species and age (Figure 23), canopy diversity, and shrub species diversity. Together, this hedgerow provided high quality habitat for resident birds, raptors, and mammals, migratory birds, and a wide variety of pollinators (e.g. butterflies, honeybees) known to be critically important for healthy ecosystems and agriculture. Functions now lost due to hedgerow clearing include cover, roosting (for example, Figure 24), nesting, foraging, travel corridor, heat and cold attenuation, carbon dioxide sequestration, and storm water filtration.

Approximately 0.7 contiguous miles along SE Dodge Park Blvd west of SE Cottrell Rd and 0.3 miles of SE Dodge Park Blvd east of SE Cottrell Rd was fully cleared (Figure 22, Figure 25), and that ecosystem no longer exists. Nearby on SE Carpenter Lane – the entering roadway to the filtration site – the mature trees and shrubbery along the roadside was also cleared (Figure 26).

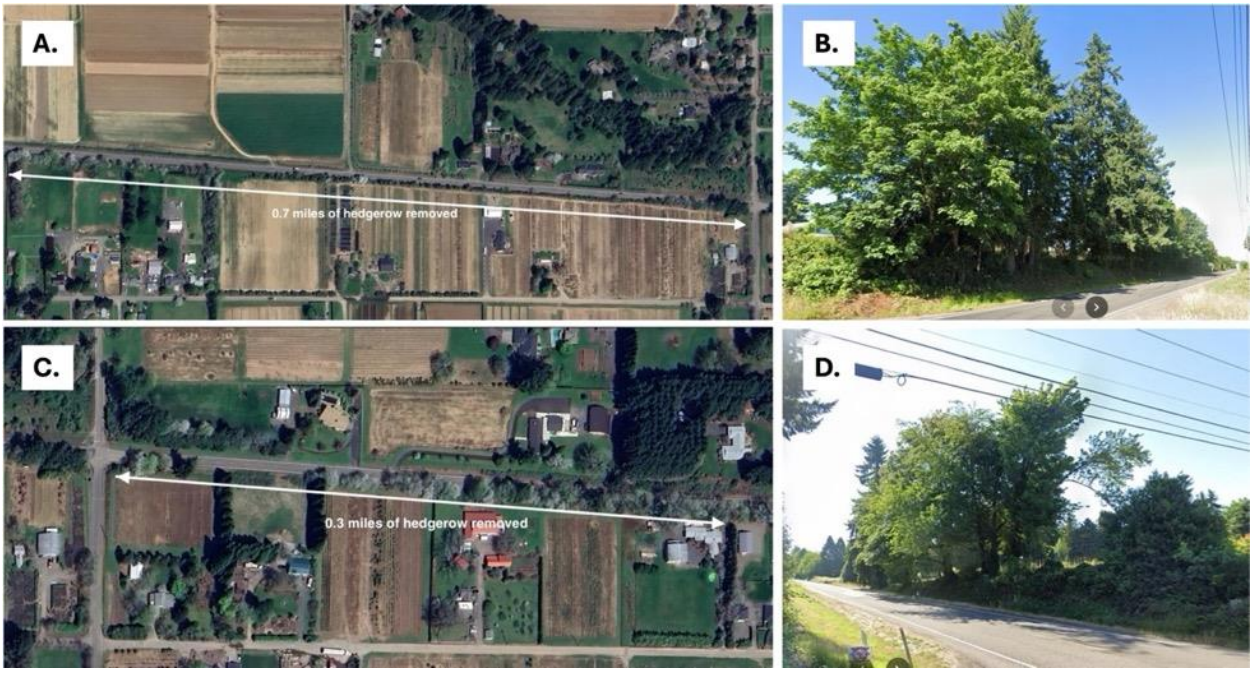


Figure 22. Before tree removal along SE Dodge Park Blvd (*GoogleEarth, accessed April 10, 2025*). Hedgerow was a mix of mature deciduous and coniferous/evergreen trees and shrubbery. (A) Approximately 0.7 miles of continuous hedgerow existed to the west of SE Cottrell Rd (*imagery from April 2023*); (B) Corner of SE Cottrell Rd and SE Dodge Park Blvd and looking at hedgerow looking west along SE Dodge Park Blvd (*imagery from June 2023*); (C) Approximately 0.3 miles of hedgerow was present east of SE Cottrell Rd. (*imagery from April 2023*); (D) Corner of SE Cottrell Rd and SE Dodge Park Blvd and looking at hedgerow looking east along SE Dodge Park Blvd (*imagery from June 2023*).

The forested edges of within and adjacent to this property provide many of the same natural resources important to wildlife. In addition to hedgerow species, forest edges may support larger numbers of species due to the presence of large trees, interior forest conditions, dead and down wood, and thermal regulation. Removing vertical structure and species composition diversity through construction activities such as tree cutting, has an adverse impact to plant species composition and forest structure, therefor wildlife habitat. Of particular concern is the removal of mature hardwood and conifer species. These impacts are long lasting (60+ years) and open the site to establishment of invasive species and noxious weeds. Spread of noxious weeds may impact adjacent farm, forests, and natural resource lands. Clearing of the hedgerow was the removal of a unique habitat.

Mammals benefit from food, cover and travel corridors provided by hedgerows and forest edges. The primary use is by small mammals such as squirrels, chipmunks, voles, raccoons, skunks and deer mice. Larger mammals use hedgerows as visual screens from roadways and as travel corridors between sites.

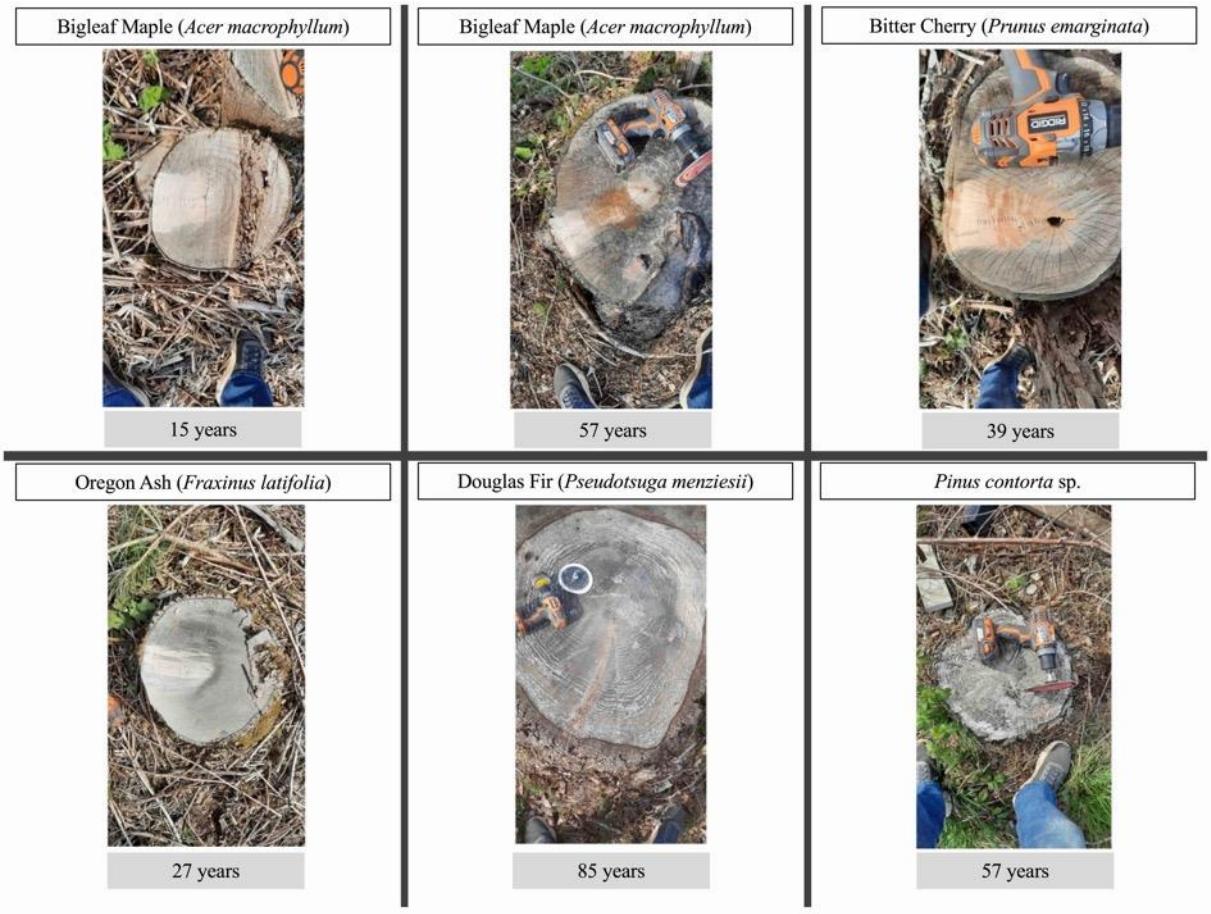


Figure 23. Representative tree diversity and ages of SE Dodge Park Blvd hedgerow removed in October 2024.



Figure 24. Owls observed in SE Dodge Park hedgerow prior to hedgerow removal and clearing. (A) Great horned owl (*Bubo virginianus*), perched in bitter cherry tree surveying nearby agricultural field on March 5, 2024 (*photo credit: Jennifer Hart*); (B) Western screech owl (*Megascops kennicottii* – identified by call) perched in Bigleaf maple (*see white arrow*), March 20, 2024. Western screech owls are considered a "species of concern" by ODFW.



Figure 25. Following hedgerow tree and habitat removal on SE Dodge Park Blvd, October 2024 (*photo credit: Guy Meacham*). Between 320-400 trees (> ½ foot in diameter) and countless shrubs were removed across one contiguous mile. (A) Stumps of old conifers (Douglas fir, multiple aged at ~80 years old) at the corner of SE Cottrell Rd and SE Dodge Park Blvd, looking west; (B) Cleared portion of SE Dodge Park Blvd where hedgerow existed, looking east to SE Cottrell Rd; (C) Stump of old red cedar (~100 years old, foreground) and stumps of big leaf maple, cherry, and Douglas fir trees, looking west toward SE Cottrell Rd; (D) Stumps of Douglas fir, including one that was aged at 80+ years old, near the intersection of SE Cottrell Rd and SE Dodge Park Blvd looking west.



Figure 26. Row of four mature, 60+ year old red cedars (left) on SE Carpenter Lane near hedgerow on SE Dodge Park Blvd that were harvested in fall of 2024. All trees and shrubbery along SE Carpenter has been cleared (right) to double the width of the lane to accommodate filtration project traffic.

Communication towers

According to the *Biological Diversity Guide for the Greater Portland-Vancouver Region*, published by Intertwine:

> *"Communication towers and the aviation lighting and high-tension lines or guy wires that are sometimes associated with them pose a hazard to birds in flight, especially night-migrating birds. Communication towers kill an estimated 4 to 5 million birds in the United States each year."*

The proposed Bull Run Communication Tower, specified in Multnomah County Exhibits A.134, A.136, and A.138, will be constructed to a height of 180 feet. No mention of potential impacts of the tower on resident and migratory avian species by the Portland Water Bureau has been documented. Given that the tower will be constructed in a sensitive and threatened habitat of several migratory avian species (e.g., crucial habitat[7] for Northern Spotted Owl and night-migrating chipping sparrow), the applicant must provide an assessment of the habitat and species present at the filtration site and the areas surrounding the proposed tower. This assessment should be ground-truthed and completed during different migratory seasons to ensure take on these affected species are will not occur.

The does show record shows that PWB intends to not use guy wires to secure the communication tower. However, literature is clear that although fatalities are less than towers with guy wires, bird fatalities do occur (Gehring et al 2011).

[7] State designated crucial habitat, as listed under the Oregon Conservation Strategy (OCS).

There is growing concern about the potential impacts of 5G and other wireless technologies on wildlife such as honeybees, migratory birds, and butterflies. However, current scientific evidence does not conclusively link 5G technology to negative effects on honeybee populations. Honeybees are known to be sensitive to electromagnetic fields (EMFs), which they use for navigation and communication. While some studies suggest that EMFs from sources like cell phone towers and power lines may disrupt bee behavior and orientation, these studies generally focus on lower frequency EMFs. The specific effects of 5G, which operates at higher frequencies, remain largely unstudied, leaving a gap in knowledge about its impact on pollinators.

In contrast, the impact of communication towers on migratory birds, particularly songbirds, has been better documented. A study by Gehring et al. (2011) found that the height and design of towers—especially whether they are guyed or not—play a significant role in bird collisions and mortality. Guyed towers were found to cause up to 16 times more bird strikes than non-guyed towers, and towers taller than 146 meters resulted in up to 70 times more impacts compared to shorter, non-guyed towers.

In summary, while bird mortality due to tower collisions is a well-documented issue, especially for migratory species, the effects of 5G on pollinators like honeybees remain uncertain due to limited and inconclusive research.

Fish, Amphibians, and Aquatic Insects

Irreparable Effects to Fish, Amphibians and Insects at Filtration Site and Finished Water Pipeline
Impaired Functioning Natural System: • Stream Habitat - Beaver Creek, Middle and North Fork • Stream Habitat – Johnson Creek
Site Preparation and Construction: ⇒ Flashy flows causing sudden increases in stream volume leading to altered stream and riparian habitat ⇒ Altered habitat from ongoing erosion causing sediment mobilization into functioning riparian habitat
Ultimate Use: ⇒ Flashy flows and disrupts fish migration and rearing ⇒ Flashy flows and altered riparian habitat disrupt amphibian and invertebrate breeding and rearing ⇒ Toxic runoff and temperature variability increase risk to fish, amphibians, and invertebrate viability

PWB sited their filtration plant at the headwaters of Johnson Creek, a tributary to the Willamette River (Figure 9). The subject property is so close to the creek that it includes a portion of the riparian corridor. Though much of the stream transits through urban areas, Johnson Creek continues to support natural production of migratory and resident salmonids including Chinook Salmon, Coho Salmon, Steelhead Trout, and Cutthroat Trout (Figure 27). Rainbow Trout are also present, but they have typically been classified as Steelhead, the anadromous (ocean-going) form of Rainbow Trout, due to spatial overlap between the two life-history types. All salmonids are protected by Oregon law as game fish and the anadromous species also receive federal protections under the U.S. Endangered Species Act (ESA). Chinook Salmon, Coho Salmon, and Steelhead Trout in Johnson Creek exist within the Lower Columbia River Evolutionary Significant Unit, listed as "threatened." This highlights the importance of fisheries resources in the creek and fragility of these populations. Only a handful of adult spawning salmon and their redds[8] are observed annually. Indeed, habitat restoration is ongoing with the aim of rebuilding fish runs in Johnson Creek, which once supported approximately 5,000 adult spawning salmon annually (JCWC 2023). The Oregon Department of Fish and Wildlife (ODFW) concluded that "persistence of native species, especially those most sensitive to habitat degradation, confirms the potential benefits of habitat protection and restoration" in Johnson Creek and other urban waterways in the Portland area (ODFW 2003).

The full extent of salmon and Steelhead distribution in Johnson Creek is unknown because survey crews are unable to reach some sections of stream on private property. ODFW does not perform comprehensive surveys and much of the data is collected by volunteers coordinated by the Johnson Creek Watershed Council (JCWC). However, available survey data indicate that Coho Salmon occur at least as far upstream as 307th Avenue, which is approximately two miles downstream of the proposed development site, and the upstream extent of Steelhead distribution is approximately one mile downstream of the site (Figure 27). Chinook Salmon are believed to utilize the lower five miles of the creek, and Cutthroat Trout occur throughout the drainage, including stream segments adjacent to the proposed project site. Cottrell CPO confirmed the stream directly adjacent to the proposed filtration plant is fish-bearing, has dense riparian vegetation, and good water quality suitable for native fishes (Figure 28). ODFW (2003) also report that headwater sites in Johnson Creek had the highest Indices of Biological Integrity relative to downstream survey sites (ODFW 2003).

Salmon and trout adjacent to, and/or downstream, of the development property are and will be impacted by sedimentation, toxic runoff, temperature increases, and increased flashy flows[9]. These impacts have already begun and will continue after construction of the project is completed. If the cumulative impact of all these factors is significant, severely depressed salmon and trout populations in the creek may be completely extirpated, or their distribution could be further constrained. However, even a small impact from the proposed facility fails Conditional Use Criteria MCC 39.7515(B), which does not allow any adverse effects from non-agricultural industries. PWB contends that implementation of BMPs and mitigation measures will reduce impacts to allowed levels defined by DEQ. However, we remind the Hearings Officer that

[8] *Redds* are salmon nests. The female salmon digs a depression in the gravel substrate with her tail, lays her eggs, and buries the eggs with gravel, leaving behind a circular-shaped mound of clean gravel visible to surveyors.
[9] *Flashy flows* are characterized by rapid increases in flow shortly after onset of a precipitation event, typically resulting in higher peak flows, high velocities, and substrate scour.

compliance with DEQ's general National Pollution Discharge Elimination System (NPDES) pollution control standards during construction of an industrial project is not sufficient to satisfy Conditional Use Criteria MCC 39.7515(B) within MUA-20, which is far more restrictive. Moreover, the general NPDES permit submitted by PWB to Multnomah County is not project-specific, and it was deceptive for PWB to represent it as such.

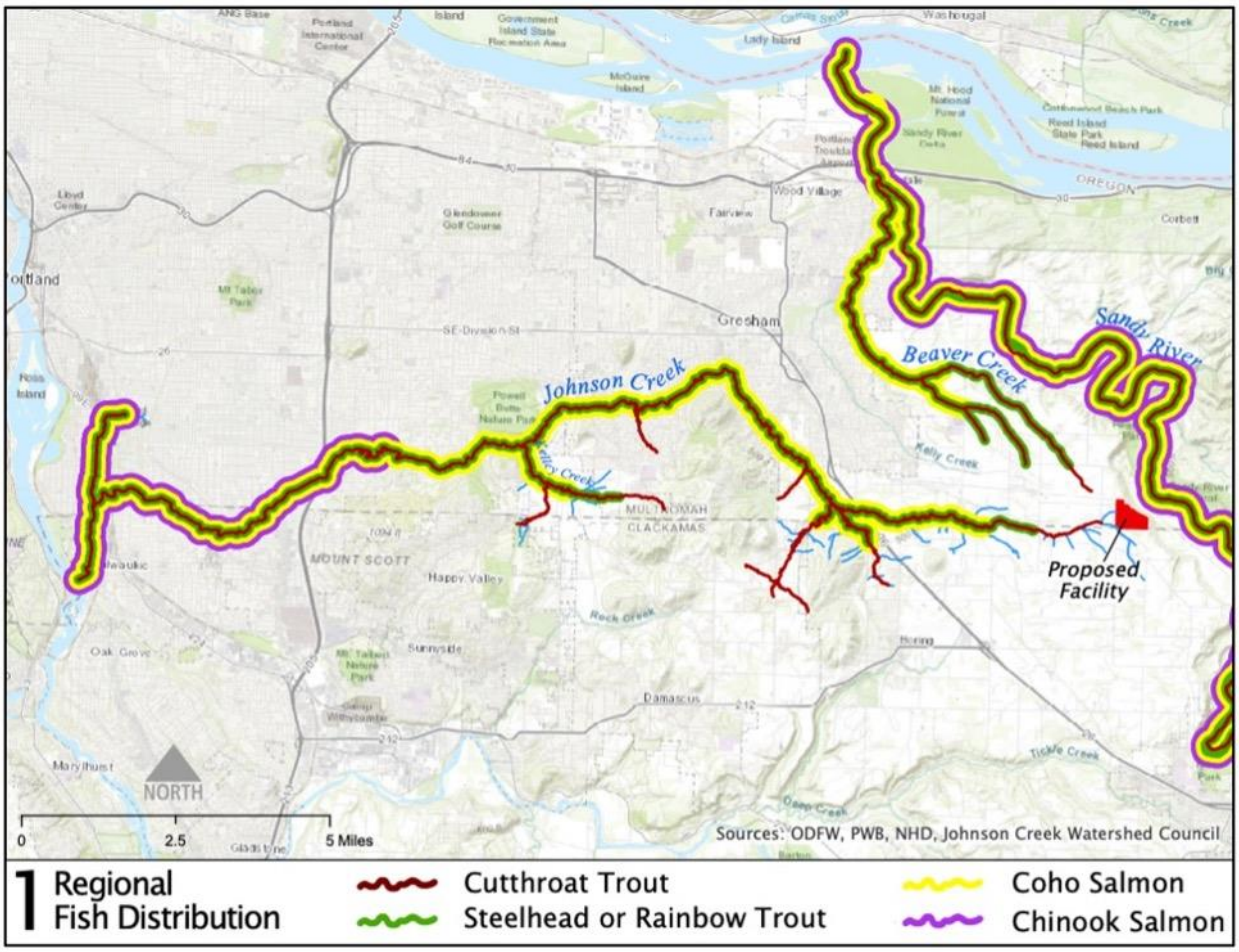


Figure 27. Salmon and trout distribution within Johnson Creek, Beaver Creek, and the Sandy River adjacent to the proposed filtration facility and associated pipelines.



Figure 28. Pictures from a stream survey conducted on August 22, 2023 in Johnson Creek directly adjacent to PWB's proposed development site at Carpenter Lane. (left) Snorkel survey to confirm fish presence (center). Water quality measurements indicating suitable dissolved oxygen (>8 mg/L) and summer temperature (<18 ºC) conditions for native cold-water fish species. Measurements taken at 17:00 PDT when stream temperature was at its daily peak. (right) Dense riparian vegetation surrounding the creek.

Riparian habitat at the headwaters of Johnson Creek adjacent to the filtration site is home to a variety of amphibians, including salamanders, frogs, and newts. Like fish, the effects of increased sedimentation, toxic runoff, temperature increases, and increased flashy flows to amphibians have occurred and will continue to occur during construction and throughout the operation of the completed facility. Amphibian species are particularly vulnerable and sensitive to habitat changes.

The northern red-legged frog (*Rana aurora*) (Figure 29) is designated an Oregon Conservation Strategy species, and are among many amphibian species that utilize the riparian habitat at the headwaters of Johnson Creek. Similar to other amphibian species, this species of frog requires a combination of aquatic and terrestrial habitats to support its life cycle. For breeding (late winter, early spring), these frogs depend on cool, clean, and still or slow-moving freshwater bodies like ponds, marshes, and slow streams with shallow water (15–60 cm) and abundant aquatic vegetation for egg-laying and cover. The current operations in which PWB is pumping 1,600 gpm into the riparian area (Figure 12) during breeding and egg-laying season reduces reproductive success of northern red-legged frogs and other amphibian species. Breeding sites must retain water long enough for tadpole development through late spring or early summer. Artificial flow increases inundate areas that attract aquatic species causing them to breed in locations that will dry out before offspring can fully develop. Outside the breeding season, the frog inhabits moist, shaded forests with ample ground cover such as leaf litter, logs, and rocks, typically within 1 mile of breeding sites. The Johnson Creek riparian zone is essential for amphibian migration and foraging. During winter, they seek shelter in damp, frost-protected areas like root masses or burrows that maintain stable temperatures and high humidity.

The rough-skinned newt (*Taricha granulosa*) (Figure 29) inhabits the riparian habitat of Johnson Creek. The rough-skinned newt requires both aquatic and terrestrial habitats to complete its life cycle. Newt breeding occurs late winter and early spring when temperatures are cool. Newts utilize still or slow-moving freshwater such as ponds, lakes, and quiet stream pools, often with submerged vegetation or woody debris for egg-laying. These water bodies must persist long enough into summer to allow larvae to develop. The current operations in which PWB is pumping 1600 gpm into the riparian area (Figure 12) during breeding and egg-laying season disturbs newts and other amphibian species. Outside the breeding season, newts live in moist terrestrial habitats like forests, especially under logs, rocks, or leaf litter that provide cover and retain moisture. They are most active in damp, shaded environments and migrate to breeding sites during the rainy season. For overwintering, they seek frost-free refuges such as burrows, root systems, or deep leaf litter that provide protection and stable humidity.

As highlighted in both amphibian examples, flashy flows, or sudden, high volume increases in streamflow can significantly threaten the viability of egg masses that are laid by resident amphibians. Flow variability and/or high flashy flows can dislodge or wash away eggs, scour streambeds, and increase sedimentation, which may smother eggs and reduce oxygen levels. Additionally, they can cause abrupt changes in water temperature and depth, disrupting proper embryonic development. Therefore, flashy flows that are created by the filtration plant construction and operation will negatively impact reproductive success of amphibians in the Johnson Creek watershed.

The effects of flashy flows and high-volume runoff in riparian habitats can also be dangerous to invertebrate species. Such disturbance disrupts food webs that depend on stable invertebrate communities. High flow events scour streambeds, displace or kill individuals, and destroy habitat structures like leaf packs, root mats, and sediment layers where many species live, feed, or lay eggs. Sudden high flows can wash away immature stages (like larvae and nymphs), reduce habitat complexity, and increase sedimentation. Furthermore, repeated disturbance also favors more tolerant, opportunistic species, reducing overall species diversity.

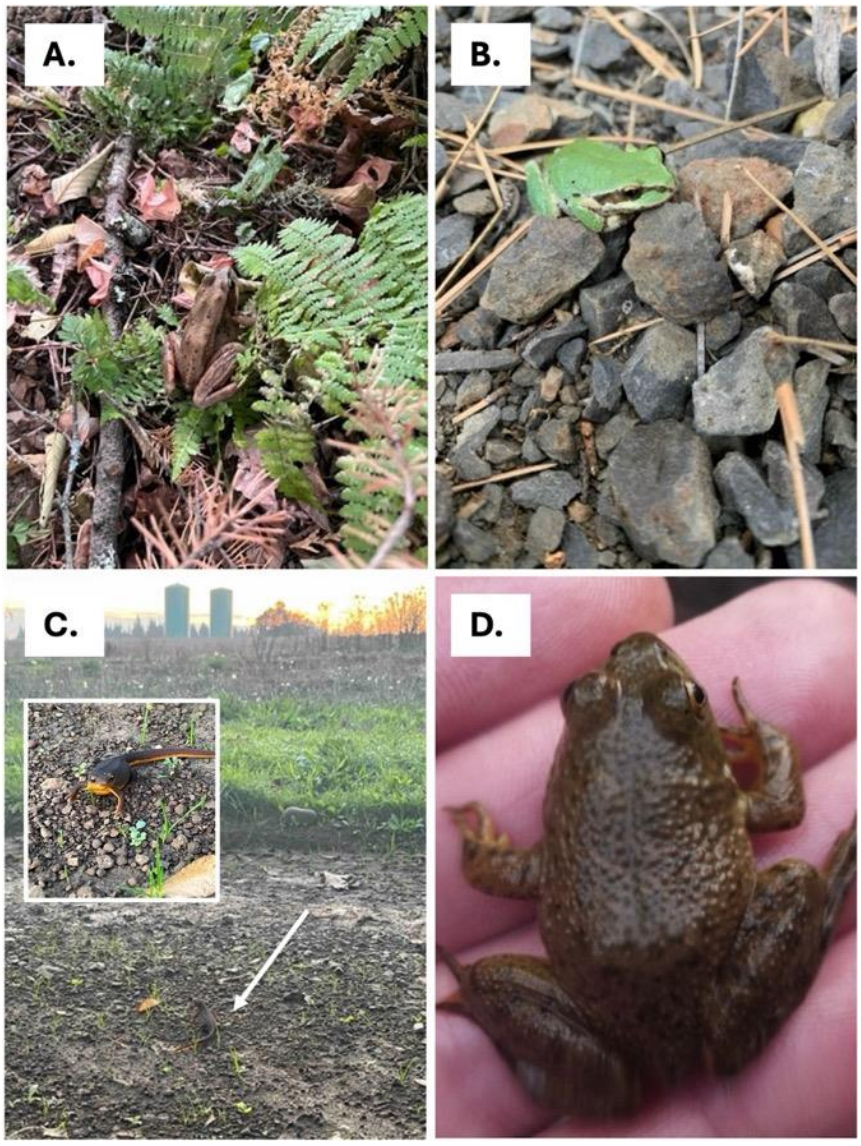


Figure 29. Amphibian species present at the filtration site and within the Johnson Creek habitat directly adjacent to the site (~150 ft from construction boundary) (*photo credit – all: Lauren Courter).* (A) Native northern red-legged frog, *Rana aurora* (August 22, 2023) located at 45°27'40.7"N 122°18'00.8"W, within Johnson Creek riparian habitat; (B) Pacific tree frog, *Pseudacris regilla* (June 12, 2020) at filtration site; (C) Native rough-skinned newt, *Taricha granulosa* (white arrow, inset) (October 22, 2023), at filtration site; and (D) Cascades frog, *Rana cascadae* (August 22, 2023), located at 45°27'40.7"N 122°18'00.8"W, within Johnson Creek riparian habitat.

Fine Sediment Inputs

Construction and operation of the proposed filtration plant will increase fine sediment loads in Johnson Creek from its headwaters to its confluence with the Willamette River. In addition, the north fork Beaver Creek is receiving excess fine sediment from construction work on the finished pipeline. Both creeks are salmon and steelhead bearing streams.

Fine sediment has a variety impacts on salmonids. For example, fines can smother and bury gravel beds, which are crucial for salmon spawning. When sediment fills the spaces between course gravel substrate, it impairs the ability of salmon and trout to dig their redds and deposit their eggs. This can significantly reduce successful spawning and egg-to-fry survival (Jensen et al. 2009). Fine sediment can also reduce water clarity and block sunlight penetration, negatively affecting aquatic plant growth. When plants are unable to photosynthesize, dissolved oxygen levels in the water can decrease, leading to oxygen-deprived conditions (Parkhill and Gulliver 2002). Finally, fine sediment deposition can also alter both macro- and microhabitat features. Excessive fine sediment can reshape the stream channel, changing flow patterns, and filling in riffles and pools that are essential for salmon feeding and refuge (Paddy 1991). Turbid water also smothers microhabitats where invertebrates live, such as within the interstitial spaces between gravel and cobbles, leading to a decline in abundance and diversity of benthic invertebrates and limiting the availability of prey for rearing salmon and trout (Cover et al. 2008).

Toxic Runoff

PWB is proposing roughly 50-acres of impervious surface within their filtration plant and administrative building complex. This includes both asphalt and concrete surfaces. The local area does not have stormwater runoff conveyance, nor stormwater treatment facilities. Therefore, most of the runoff from the proposed facility will flow into Johnson Creek, carrying with it numerous toxins. Contamination of waterways due to the discharge of pollutants has significant negative effects on salmon and trout populations. Salmonids are highly sensitive to changes in water quality, and the presence of toxic substances in their habitat can lead to a variety of detrimental impacts. Specifically, pollutants like heavy metals, pesticides, industrial chemicals, and petroleum products can disrupt salmonid physiological processes, cause organ damage, reduce feeding activity, alter migratory patterns, reduced predator avoidance, impair reproduction, and cause death (DiGiulio and Hinton 2008). Researchers in Washington recently discovered that chemicals deposited on roadways from tires cause widespread prespawning mortality in Coho Salmon following fall freshets (Tian et al. 2021), offering a contemporary example of how devastating toxic runoff from the proposed filtration plant could be for struggling salmon populations in Johnson Creek.

Temperature Increases

Temperature influences the abundance of salmonids because it changes physiological demands on fish (Li et al. 1994; Ebersole et al. 2003). Higher temperatures require higher rates of respiration and additional food consumption (Brett 1971). Above certain critical thresholds, temperatures become lethal, and salmonids exhibit avoidance behavior (Brett 1952). Oregon has established temperature water quality standards for the Lower Columbia River to protect migrating salmon and steelhead, which include a 20°C numeric criterion for limiting maximum water temperatures (USEPA 2021). Salmon and trout typically prefer water temperatures between 14 and 18 ^{o}C for optimum growth and survival. At approximately 18 ^{o}C, most salmonids seek thermal refugia (e.g. Brett 1971).

The headwaters of Johnson Creek currently has water temperatures suitable for salmonids[10], but even a small increase of less than 1°C will push summer temperatures above 18°C, impacting growth and survival of salmon and trout. Large, paved surfaces, such as the facility proposed at the headwaters of Johnson Creek, are known to cause thermal pollution, degrading stream habitat and harming coldwater fish species (Herb 2008). Moreover, PWB plans to hold stormwater in detention ponds prior to release into Johnson Creek. These ponds will increase the transfer of solar energy, heating up the water in the spring and summer prior to its release into the creek. In addition, turbidity from runoff at the site will raise water temperature because suspended particles absorb the sun's heat.

Flashy Flows

Flashy flows refer to rapid and unpredictable changes in water flow within rivers and streams. These changes are often caused by urbanization, deforestation, and changes in land use that alter the natural hydrological cycle. Impervious surfaces like asphalt and concrete increase ramping rates in streams following rain events. JCWC is working with Depave, another local non-profit, to reduce the amount of impervious pavement within the watershed. 50-acres of new impervious surface at the headwaters of Johnson Creek conflicts with this initiative.

Altered flow regimes have numerous negative impacts on fish and aquatic ecosystems (Sofi et al. 2020). Fish in Johnson Creek are adapted to a specific flow pattern that provide suitable conditions for spawning and rearing. Flashy flows scour course gravel and cobble substrate, dislodge instream wood, erode the stream banks, and simplify habitats, making it difficult for fish to find suitable areas for spawning, rearing, and refuge. Salmon and trout also rely on specific water velocity and depth conditions for successful reproduction. Sudden high flows can scour fish eggs and disrupt the development of young fish by eroding nesting sites and changing the distribution of important substrate materials. Sudden changes in flow can also wash away insects and other aquatic invertebrates that are an essential food source for rearing salmonids. Many fish species undertake seasonal migrations for feeding, breeding, or avoiding adverse conditions. Flashy flows can impede these migrations by creating barriers, disrupting navigational cues, and causing physical injuries.

[10] Water temperature was 17.2 °C in Johnson Creek adjacent to PWB's proposed development site on August 22, 2023 at 17:00 PDT.

Aesthetic Resources: Scenery, Landscape, Soundscape, Natural Darkness

Irreparable Effects on Aesthetic Resources at the Filtration Site and Along Finished Pipeline Route

Impaired Functioning Natural System:

- Altered natural landforms, vegetation, and topography
- Fragmented a once cohesive natural and agricultural setting
- Light and noise pollution disrupt nocturnal wildlife and natural soundscapes
- Light and extreme noise pollution disrupt migration corridor habitat for migratory large mammals, such as the Roosevelt Elk, leading to rerouting or abandonment of migratory route.

Site Preparation and Construction Effects:

⇒ Site grading and vegetation removal caused immediate and irreversible changes to the landscape
⇒ Noise from heavy machinery and construction traffic disrupted the rural soundscape
⇒ Visual intrusion from equipment and temporary structures has reduced scenic quality
⇒ The initial phase of development has set a precedent for visual and ecological disruption
⇒ Extreme noise generated from drilling and blasting disrupting migration patterns of mammals and birds in migration corridor

Ultimate Use – Facility and Underground Pipeline Effects:

⇒ Large-scale, utilitarian architecture clashes with the surrounding rural landscape and scenic views
⇒ Continuous noise from facility operations and pipeline systems diminishes the area's natural tranquility
⇒ Permanent lighting creates ongoing light pollution, degrading night-sky visibility and impacting wildlife
⇒ Industrial presence reduces the area's recreational and tourism appeal and conflicts with local land use vision

Aesthetic resources refer to the features of an environment that contribute to its visual and sensory appeal. These resources shape how people perceive and experience a place, particularly in terms of beauty, tranquility, and harmony. Aesthetic resources can include elements such as scenic views, landscape patterns, natural landforms, vegetation, bodies of water, cultural landmarks, and even the quality of light and sound in an area.

In environmental planning and impact assessment, aesthetic resources are evaluated for their contribution to the character and identity of a region. They are especially important in areas where visual or sensory qualities attract tourism, support recreation, or enhance quality of life for local communities. Impacts on these resources—such as through construction, industrial development, or pollution—can lead to a diminished experience of the environment and long-term cultural and economic loss.

Construction of the water treatment plant and associated pipelines has significantly altered the aesthetic resources of the communities of Cottrell and Pleasant Home, including the natural scenery and landscape. The facility requires substantial land area, huge concrete structures, tanks, water holding basins, and mechanical equipment, which has, and will continue to, disrupt the visual harmony of the area—known for its natural beauty and rural character. The presence of the infrastructure introduces industrial elements into the environment, replacing open vistas or green spaces with visually stark, utilitarian architecture that clashes with the surrounding landscape. This visual intrusion reduces the area's appeal for residents, tourists, and recreational users and conflicts with the land use vision for the area.

The landscape itself has already undergone considerable transformation during the initial construction phase of the water treatment plant. Site grading, vegetation removal, and changes in land contour resulted in permanent modifications to the topography and ecological balance of the area. What was once a cohesive natural, agricultural setting is now fragmented by roads, fencing, and other support infrastructure. This contrast between the industrial site and the existing environment has been particularly jarring (Figure 30) and restoring the land to its prior state if construction is allowed to continue will be impossible.

In addition to visual impacts, the soundscape of the surrounding area has been, and will continue to be, affected by the operation of pumps, motors, and vehicular traffic associated with the treatment plant. These continuous and intermittent noises disrupt the ambient natural sounds that contribute to the peacefulness of the rural setting. Such auditory intrusions lead to a diminished experience of the outdoors and contribute to a sense of industrial encroachment, especially for nearby homes and farms, natural spaces like the Sandy River corridor, and parks such as Oxbow Regional Park and Dodge Park.

Loud sounds and ground vibrations can significantly disrupt elk migration patterns (Figure 30), altering both their routes and behaviors. Elk are highly sensitive to auditory and vibrational stimuli, and consistent exposure to noise—especially from human activities such as road traffic, logging operations, industrial development, or recreation—can lead to the abandonment or rerouting of traditional migratory corridors. This avoidance behavior often results in elk taking longer, less efficient paths that demand more energy and expose them to increased risks, such as predation or human encounters. Chronic noise can also induce stress responses, reducing foraging efficiency, disrupting rest, and lowering reproductive success. For example, studies have shown that elk will avoid areas within one to two kilometers of active natural gas fields and often delay or alter their migration in regions with frequent motorized recreation. Over time, if disturbances persist, entire generations may lose knowledge of historic migration routes, leading to a decline in corridor use and fragmentation of critical habitats. These changes compress

available habitat, potentially increasing competition for resources and susceptibility to disease. Thus, human-generated noise and vibration can have both immediate and long-lasting ecological consequences on elk populations and their movement patterns.

Extreme loud sounds and vibrations are expected to continue for 2-3 years to complete the raw water pipeline that begins at SE Lusted Rd and ends at the filtration site at the top of the Sandy River canyon. This portal is just feet away from the migration corridor that is utilized by animals such as the Roosevelt elk herd that frequents in the fall and early winter. To complete the pipeline, contractors will bore horizontally through basalt and other rock with the shaft stretching to the filtration site 300 ft above. This technically challenging task will require specialized boring equipment and explosives like dynamite. Recognizing the extreme sound required for boring, contractors have erected a sound barrier running east from the portal (seen in background of photo in Figure 7A). However, no sound barrier has been constructed in the zone where explosions are occurring at the southeast corner of the filtration property (see star denoting blasting in Figure 31). This blasting zone is about 400 feet from the SEC-h overlay to the east. According to PWB engineers, blasting with explosives may occur throughout the underground pipeline route if boring proves ineffective[11]. Blasting with explosives was not presented to the county during the 2023 land use proceedings. Public was not aware of the use of explosives until 2025.

[11] Personal communication during in-person meeting, Courter with PWB engineers, Bonita Oswald, and Walter family. Meeting occurred on Walter property in winter of 2025.



Figure 30. Aerial picture of the water treatment plant showing its contrast to the surrounding environment. There are no facilities as large or remotely similar to Portland's proposed treatment plant anywhere within a 5-mile radius. All the industrial buildings in the region are agricultural businesses. PWB often cites to the existence of their Lusted Hill facility as a comparable site about 1-mile north of the proposed development area, but the Lusted Hill facility is tiny by comparison, barely visible from the air and hidden in the trees.

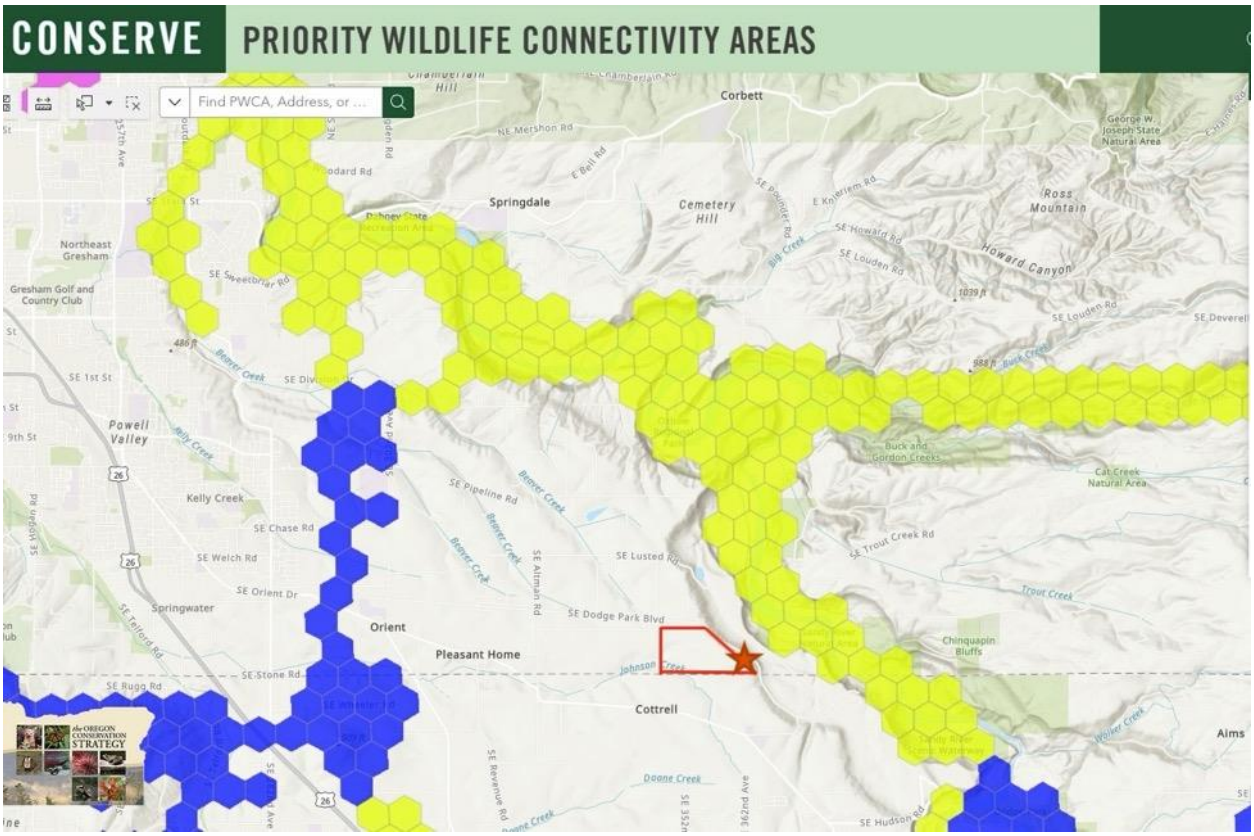


Figure 31. Wildlife migration corridors surrounding filtration (red outline) and pipeline projects[12], according to the Oregon Conservation Strategy. Orange star denotes location of blasting and boring for the raw water pipeline. Purple tiles represent *regions*, or "highest-value habitat for facilitating species movement". Yellow tiles denote *connectors*, or "the best available habitat for facilitating movement from *Region* to *Region*. *Connectors* may pass through high-quality habitat in intact, relatively undisturbed parts of the landscape, as well as the best remaining marginal habitat in developed or degraded areas."

Light pollution is another adverse consequence tied to the operation of the water treatment facility (Figure 32). For safety and operational efficiency, the plant will be illuminated around the clock with high-intensity lighting. This artificial light will spill into adjacent areas, washing out night skies and disrupting nocturnal wildlife behavior. In rural natural areas where dark skies are a valued part of the environmental and aesthetic experience, such light pollution has, and will continue to, significantly degrade the quality of the nightscape. Collectively, the visual, auditory, and lighting impacts of the water treatment plant will substantially erode the aesthetic character of the surrounding area.

[12] https://experience.arcgis.com/experience/6979b6598f904951bd0af1821e1595f1/ ; *accessed 4/14/2025*



Figure 32. This photo, taken from a property adjacent to the water treatment plant construction site, illustrates light intrusion and its impact on night-sky conditions. 24-hour lighting at the completed facility is expected to be of similar intensity.

Agricultural Resources

Irreparable Effects to Agricultural Resources at the Filtration Site and Along Finished Pipeline Route
Impaired Functioning Natural System: • Renewable, high-value Agricultural soils • Farmland and Surrounding ecosystem, generally
Site Preparation and Construction Effects: ⇒ More than 90 acres of *renewable* Class II soils converted to *nonrewable*; permanent loss of farmable soil ⇒ Modification of natural water drainage, permanently affecting surrounding agricultural resources ⇒ Ecosystem disruption
Ultimate Use – Facility and Underground Pipeline Effects: ⇒ More than 40 acres of high-value farmland out of production; permanent soil loss ⇒ Modification of natural water drainage, permanently affecting surrounding agricultural resources ⇒ Ecosystem disruption and decreased biodiversity

Agricultural resources are considered a natural resource because farming and food production rely on natural elements—such as soil, water, sunlight, and climate. Although shaped and managed by humans, these fields depend on natural systems to remain productive. The land used for farming is a renewable resource, but only if it is cared for in a sustainable way to prevent issues like soil erosion or loss of fertility. Because agricultural fields provide food, support livelihoods, and are tied to ecological processes, they are recognized as a valuable part of our natural resource base.

Soil is considered a renewable natural resource for agriculture. Current farming practices involve sustainable soil management to conserve the resource for long-term crop production, such as crop rotation, reduced tillage, and erosion control. These conservation practices were employed by the previous farming operators (Surface Nursery, Ekstrom Nursery)-at the filtration construction site and along the finished pipeline route-for several decades to maintain and enhance the soil classified as *high-value*[13], according to the State of Oregon and United States Department of Agriculture (USDA). More specifically, the excavated farmland with fertile soil destroyed at the filtration and finished pipeline route is identified as Class II soil. According to

[13] USDA classifies "high-value" based on soil quality, topography, water availability, land use capability (land designated for agriculture), soil classification. https://www.nrcs.usda.gov/state-offices/oregon/soil-survey-in-oregon

the USDA's Land Capability Classification system, Class II soil is considered the most productive. The fertile soil at these sites is no longer renewable and cannot be farmed. The entire 90+ acre filtration site has been adulterated to some capacity, and ~40 acres will never be farmed again due to structures and paving. The remaining acreage, if purposed for future farming, will require many years of extensive reconditioning and fortification that would come at a high monetary cost to farm operators. Thereby, this likely causes crop production to cease for the foreseeable future.

Not only has construction caused irreparable effects to agricultural resources, but the ultimate use, or the finished filtration facility, will as well. Both the permanent altered topography of the property and 40+ acres of impervious surfaces will disrupt natural water drainage. Altered topography from construction efforts have thus far proved this point, as previously described. Neighboring farms are now inundated with unprecedented flooding due to new drainage patterns, leading to crop loss (Figure 11).

Farmland supports pollinators, birds, and beneficial insects. Such biodiversity is characteristic farmland, and the larger, less fragmented farmland acreage, the better. Large, connected acreage provides uninterrupted and safe habitats for bees and butterflies, and undisturbed areas for resident and migratory bird species for foraging, shelter, and nesting. According to the recent USDA Census of Agriculture (2022)[14], the PWB's proposed filtration facility site is one of the largest contiguous pieces of farmland in Multnomah County, exceeding the county's average acreage at ~40 acres. It is surrounded by similarly sized farmland parcels. Removing 90+ contiguous acres from agricultural production fragments the area's natural resources. By removing this significant agricultural natural resource, PWB is disrupting the existing ecosystem and permanently altering the area's biodiversity.

[14] https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Census_by_State/Oregon/index.php; accessed April 10, 2025.

CONCLUSION

Based on the evidence presented throughout this report, the Portland Water Bureau's proposed water filtration facility fails to meet the Conditional Use Criteria outlined in Multnomah County Code 39.7515(B), which requires that a proposed use "will not adversely affect natural resources." The project has already caused significant, irreversible impacts to surface water, wetlands, wildlife habitat, groundwater systems, scenic and aesthetic resources, and prime agricultural land. These impacts are not speculative—they are ongoing and well-documented. Moreover, PWB's reliance on mitigation and restoration efforts to justify these harms directly contradicts the plain language of the Conditional Use Criteria, which does not permit mitigation as a substitute for avoidance.

The cumulative scope of environmental damage, regulatory oversights, and procedural missteps demonstrates that this project is fundamentally incompatible with the land use vision and environmental protections established for the West of Sandy River Planning Area. PWB's aggressive construction timeline, failure to complete full natural resource inventories, avoidance of the NEPA/EIS process despite proximity to a Wild and Scenic River, and disregard for the rural character and zoning of the area only reinforce this conclusion. Continued development under these circumstances not only violates local planning rules but threatens long-term environmental and community integrity.

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CHARLES CIECKO

Parks and Natural Resources Manager (retired)

Charles Ciecko has lived in rural east Multnomah County for 50 years. His 34-year career was in parks and natural resource management. Experience included: Regional Park Supervisor at Oxbow Regional Park; Director, Multnomah County Park Services Division; Director, Metro Regional Parks and Greenspaces Department; Director, North Clackamas Park and Recreation District. Formerly, owned and managed 56 acres of timberland. Currently serving third term as a member of the Board of Directors for Rural Fire Protection District 10 (RFPD10). OSU graduate, BS degree, 1974. Having raised a family near Oxbow Park along with his work and volunteer experience, Charles provides a unique perspective regarding the PWB's proposal to construct and operate an industrial scale water filtration plant and associated raw and finished water pipelines in this rural community.

STEVE SMITH

Wildlife Biologist (U.S. Fish and Wildlife Services, retired)

Steven Smith has had a 34-year career as a professional wildlife biologist. A 1978 graduate of Wildlife Science and Rangeland Resource Management programs at Oregon State University, Steven has worked for the U.S. Forest Service, Oregon Department of Fish and Wildlife, and U.S. Fish &Wildlife Service. Throughout his career, Steven has worked with farm and forest landowners to conduct habitat assessments, integrate farm, forest and wildlife management systems, and implement habitat restoration projects to benefit fish and wildlife resources. The private landowner assistance programs he implemented have been recognized nationally as a model for achieving cooperative wildlife management on private and public lands.

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David has over 45 years of Pacific Northwest experience as an engineering geologist and hydrogeologist providing planning, design, construction, and expert witness expertise. His geotechnical, engineering geologic, and environmental remediation areas of practice include the full range of engineering design & construction, strategic pre-purchase assessment and identification of extraordinary geotechnical and environmental development costs, landslide assessment and mitigation, subdrainage, seismic risk assessments, groundwater wells, directional drilling, health & safety, disaster response planning/implementation, regulatory compliance, and assessment/remediation of contaminated soil, groundwater, and buildings. He also has consulted with agencies on policy/code development.

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Toxicologist

Lauren Courter is a toxicologist and a co-founding scientist of Mount Hood Environmental (MHE), an Oregon-based science consulting company with additional staff in Washington and Idaho. MHE specializes in fisheries research, water quality monitoring, and aquatic toxicology. For nearly thirteen years she has been a principal investigator on aquatic toxicology and water quality research, regularly contributing to various MHE technical writing assignments covering a wide variety of topics. Prior to MHE, Lauren engaged in eight years of academic research in the fields of carcinogenesis, molecular toxicology and neurobiology. Her graduate and post-graduate work focused on the genotoxicity of polycyclic aromatic hydrocarbons and toxicant effects on neurodevelopment, respectively. She has a Ph.D in Toxicology from Oregon State University and a bachelor's degree in Biology with a minor in Business Administration from Pacific University.

Lauren is an expert in the study of non-target impacts of herbicides on aquatic and human health. She has written numerous reports and is well-published in her field. More specifically, her consulting research focuses on the effects of terrestrial and aquatic herbicide applications on sensitive aquatic species, relic sediment contamination on ESA-listed salmonid species, and water quality and nutrient monitoring. Her research has spanned basins across Oregon and Washington, including the Deschutes, Willamette and Upper Columbia basins. Lauren regularly serves as a consultant to several private timber companies leading herbicide monitoring efforts on the Oregon coast to determine non-target impacts of and the risks associated with silvicultural operations on human health and aquatic species. She has also served as a legal expert on several issues, including aquatic toxicity work in Douglas County, Oregon on an accidental release of concrete into the Umpqua River. More recently, she has been contracted as an expert to review and disseminate existing contaminant data and literature for the Portland Harbor Superfund Site.

IAN COURTER, M.S.
Fisheries Scientist

Ian Courter is a cofounder of Mount Hood Environmental (MHE), an Oregon-based science consulting company with additional staff in Washington and Idaho. MHE specializes in fisheries research, water quality monitoring, and aquatic toxicology. Prior to establishing MHE, Ian provided project leadership, management, design, analysis, and data collection for Cramer Fish Sciences in Gresham, Oregon. In addition to his role as a senior scientist, Ian served as the Program Lead for Oregon operations. Ian has served as principal investigator on a variety of salmon and steelhead research projects in watersheds throughout the Pacific Northwest including the Cowlitz, Klamath, Willamette, Yakima, Wenatchee, Methow, Deschutes, Owyhee, Snake, Upper Columbia, and Sacramento/San Joaquin River Basins. He has a Master's degree in Fisheries Science with a minor in Natural Resource Policy and Law from Oregon State University, a bachelor's degree in Environmental Biology from Pacific University, and a Project Management certification from Portland State University, among other certifications.