Land Use Applications Introduction

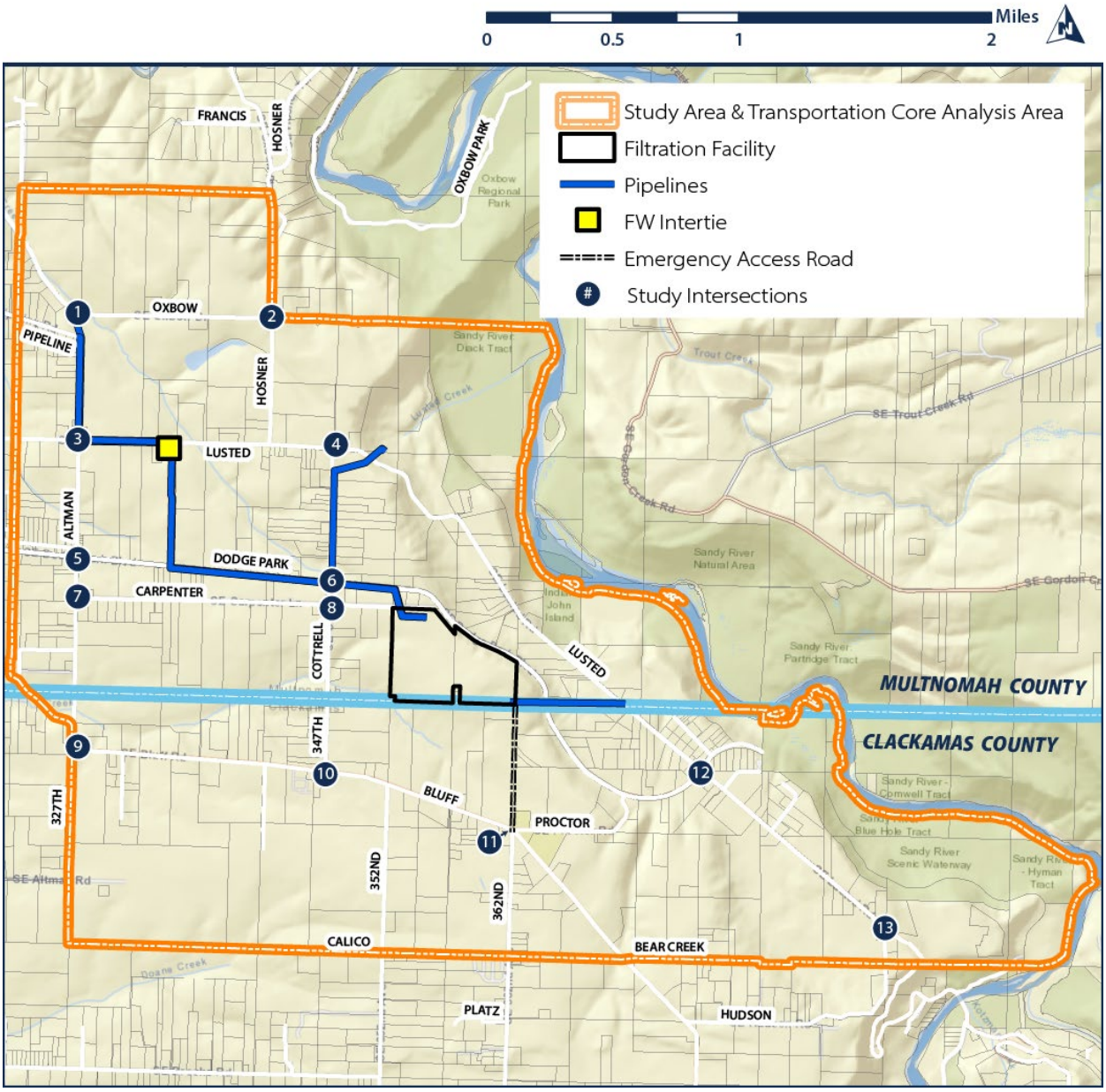

Figure 1. Bull Run Water Filtration Project Scope and Study Area

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Abbreviations and Acronyms

General Terms	
appurtenances	Auxiliary, physical components of a pipeline, such as accessways, vents, drains, and valve boxes, located along pipeline alignments
BDS	Portland Bureau of Development Services
BMP	best management practices
DEQ	Oregon Department of Environmental Quality
emergency access road	The secondary access road to filtration facility site providing access for emergency vehicles and planned and unplanned maintenance or other events when the primary access from Carpenter Lane is not reasonably available
EPA	The U.S. Environmental Protection Agency
filtration facility	The proposed water filtration facility on Carpenter Lane
filtration facility site	The approximately 94-acre site on Carpenter Lane where the filtration facility is proposed
the intertie	The finished water pipeline connection facility on Lusted Road near Altman Road
FW pipeline(s)	Finished water pipeline(s)
Hudson Intertie	The existing pipeline connection facility on Lusted Road near Hudson Road, at the south end of the study area
LHTF	Lusted Hill Treatment Facility
LRDM	Lusted Road Distribution Main
LT2 Rule	The EPA's Long-Term 2 Enhanced Surface Water Treatment Rule
Multnomah Connection	The location along Lusted Road where the new raw water (RW) pipelines connect to the three existing Water Bureau conduits
NOAP	Notice of forest operations permit
PHWD	Pleasant Home Water District (a water utility primarily serving residential customers in east Multnomah County that purchases water from the Water Bureau)
pipelines	The RW pipelines and FW pipelines
the project	The proposed Bull Run Filtration Project, including the filtration facility, communications tower, emergency access road, intertie building, and related water pipelines and appurtenances
public facilities	public utilities, schools, and solar facilities
ROW	public road right-of-way
RW pipeline(s)	raw water pipeline(s)
SCADA	Supervisory Control and Data Acquisition systems that help operators access actionable data and manage equipment
study area	The project-wide consolidated study area described in the Introduction and elsewhere, which includes the entirety of the core analysis areas for the filtration facility and the pipelines
solar facility	photovoltaic solar power generation facility
Water Bureau	Portland Water Bureau

County Codes References	
Multnomah County	
CFU	Commercial Forest Use (resource base zone) – MCC 39.4050 *et seq* (Part 4.A.1)
CS use	community service use including public water facilities – MCC 39.7500 *et seq* (Part 7.B) and communications tower wireless communications facilities – MCC 39.7700 *et seq* (Part 7.B.4)
CUP	conditional use permit
DR	design review – MCC 39.800 *et seq* (Part 8.A)
EFU	Exclusive Farm Use (resource base zone) – MCC 39.4200 *et seq* (Part 4.A.2)
GH	Geological Hazards (overlay zone) – MCC 39.5070 *et seq* (Part 5.B)
MCC	Multnomah County Code (including Chapter 39 Zoning Code)
MUA	Multiple Use Agricultural (non-resource base zone) – MCC 39.4300 *et seq* (Part 4.B.1)
RR	Rural Residential (non-resource base zone) – MCC 39.4350 *et seq* (Part 4.B.2)
SEC	Significant Environmental Concern (overlay zone) West of the Sandy River – MCC Part 5.H (39.5500 *et seq*)
utility facilities	utility facilities necessary for public service
Clackamas County	
CCZDO	Clackamas County Zoning and Development Ordinance
EFU	Exclusive Farm Use (base zone) – CCZDO Section 401
RRFF-5	Rural Residential Farm Forest (base zone) – CCZDO Section 315
RSCA	River and Stream Conservation Area (overlay zone) – CCZDO Section 704
TBR	Timber District (base zone) – CCZDO Section 406
Impact Study References	
TIA	Transportation Impact Analysis
HHMP	Hazardous Material Management Plan
Measurement Abbreviations	
gpd	gallons per day
gph	gallons per hour
lf	linear feet
mgd	million gallons per day
mph	miles per hour
sf	square feet
vtd	vehicle trips per day

Note: Since all roads, streets, lanes, drives, and boulevards in the study area have the same SE modifier, the narrative simply states the road name to reduce the length of the document and increase its readability. For example, SE Lusted Road is referenced in this narrative as Lusted Road and SE Carpenter Lane is referenced as Carpenter Lane.

Technical Appendices

The Water Bureau has commissioned a series of technical appendices designed to address Multnomah County land use requirements as expressed in the MCC. Technical appendices are organized by category. All appendices are incorporated in their entirety into these narratives and proposed findings by this reference.

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        - 1S4E22BA-00100
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        - 1S4E21A-00900 Deed (2009)
        - 1S4E21A-00900 Deed (2015)
        - 1S4E21A-00900 Deed (2018)
        - 1S4E21A-00900 Zoning Map (1962)
        - 1S4E21A-00900 ZO (1968)
        - 1S4E22DB-00300 Deed (1972)
        - 1S4E22DB-00300 Deed (1972) Map
        - 1S4E22DB-00300 Deed (1992)
        - 1S4E22DB-00300 Deed (1999) 1
        - 1S4E22DB-00300 Deed (1999) 2
        - 1S4E22DB-00300 Deed (1999) 3
        - 1S4E22DB-00300 Deed (2006)
        - 1S4E22DB-00300 Deed (2007)
        - 1S4E22DB-00300 Deed (2013)
    c. Raw Water Pipelines Property Deeds ..... Appendix K.3c
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        - 1S4E23C-00800 Title Report 1
        - 1S4E23C-00800 Title Report Map
        - 1S4E23C-00800 Title Report 2
        - 1S4E23C-00800 Title Report Vesting Deeds
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        - 1S4E23C-02200 (2020)

N. Expert Resumes

1. Adrian McJunkin PE
2. Allan Felsot PhD
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18. Morgan MacRostie PE
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20. Qianru Deng PE
21. Rajiv Ali PE GE
22. Richard Martin EIT
23. Robin Smyth PE
24. Travis Arnzen PE
25. Valmont Structures 2021 AISC Certification

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Introduction

This Introduction provides background information and context for the project's required land use applications in Multnomah County. This Introduction:

- Provides an overview of the existing Bull Run water system;
- Presents the rationale for the Bull Run Filtration Project (the project), its design and function;
- Provides a summary of required land use permits;
- Explains the organizational framework for the Multnomah County application narratives;
- Defines the project study area for the proposed filtration facility and pipelines in Multnomah County and the emergency access road in Clackamas County;
- Characterizes land use and environmental conditions in the study area; and
- Summarizes the Water Bureau's community outreach for the project and key changes made in the filtration facility design as a result.

More detailed findings related to applicable Multnomah County review criteria are found in Sections 1-2 of this application narrative. The Water Bureau will submit a Clackamas County application to allow emergency road access from Bluff Road to the filtration facility site.

The Bull Run Water System

The Bull Run water system was constructed in the late 1800s when 24 miles of pipelines were laid to create a gravity-fed supply of clean water from the Bull Run River to Portland (Figure 2). The system became operational in 1895 and—along with evolving agricultural, forestry, and rural residential uses—has helped define the character of the area for the last 125 years. President Theodore Roosevelt signed the Bull Run Trespass Act, which established the Bull Run Watershed protection area in 1904. In the Bull Run protected area, the Act restricts logging, livestock grazing, and public access, among other activities, to maintain water quality.

Figure 2. Pipeline Construction in the late 1800s

Over the years, the Water Bureau has made many improvements to the regional water system, including replacement of the original wooden pipelines and construction of additional conduits.

This water system, which will include the filtration facility once constructed, provides safe and reliable drinking water to nearly one million people and 19 wholesale customers. The existing Lusted Hill Treatment Facility (LHTF) is located one-half mile north of the proposed filtration facility and is designed to reduce corrosion of lead pipes found in some household and building plumbing.

Figure 3 shows the current Bull Run water system and distribution area. The proposed water filtration facility is located near the center of this map, near the existing Lusted Hill Treatment Facility (LHTF).

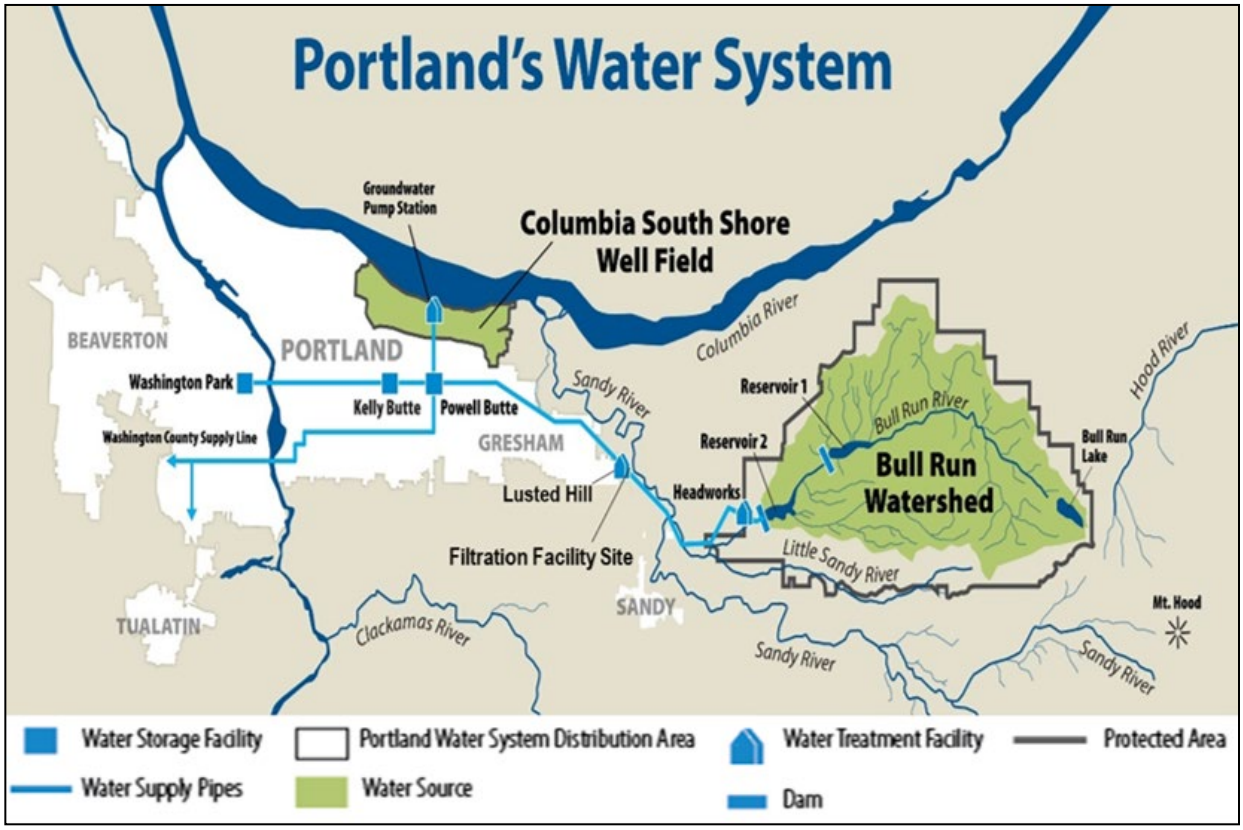

Figure 3. Portland's Water System Showing Proposed Filtration Facility Site

Overall Project Need and Design Parameters

This project is necessary to comply with U.S. Environmental Protection Agency (EPA) and Oregon Health Authority (OHA) drinking water requirements.

In 2006, EPA issued the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule) to reduce illnesses caused by *Cryptosporidium* and other pathogens in drinking water. In January 2017, the Water Bureau began detecting *Cryptosporidium* in the Bull Run supply that, while at low levels, exceeded what is allowable by these drinking water regulations. The LT2 Rule aims to reduce disease incidence associated with microorganisms in drinking water and requires treatment for *Cryptosporidium*. In Oregon, OHA is responsible for administering the LT2 Rule and other federal safe drinking water regulations.

From 2012 to 2017, the Water Bureau had a variance from the treatment requirements for *Cryptosporidium*, by demonstrating that treatment for *Cryptosporidium* at the Bull Run Watershed intake was not necessary to protect public health because of the nature of the raw water source. However, this variance was revoked by OHA in 2017 due to low level detections of *Cryptosporidium*, requiring that the Water Bureau treat the water from the Bull Run River for the microorganism.

To comply with LT2, the Portland City Council voted to construct the Bull Run Filtration Project (the project). Shortly thereafter, the City entered into a bilateral compliance agreement with OHA in December 2017. The bilateral compliance agreement establishes the requirement to install treatment facilities and meet treatment technique requirements of state law. Under the agreement, water meeting the requirements of state law will be provided to customers no later than September 2027. The treatment facilities of the project will bring the Water Bureau's facilities into compliance with the requirements of the bilateral compliance agreement and state and federal law.

Project Design Parameters

The project is necessary to protect public health, comply with federal and state drinking water regulations, and continue providing reliable, safe drinking water to nearly one million people. To ensure the future of safe drinking water for years to come, project facilities must be resilient to natural disasters, with the ability to expand as needed to meet evolving water quality standards and the region's potable water needs.

Importance of Gravity Flow System

The proposed filtration facility site was purchased by the City of Portland in 1975 for future water facilities because of its strategic location and ability to connect to the Water Bureau's gravity flow water system. The late 1800s originators of the Bull Run supply planned the system to be able to adapt to a changing environment and maintain gravity flow. The project is strategically located to maximize the existing gravity-flow (rather than mechanical pumping) system, which reduces energy consumption, lowers consumer operating costs, and increases reliability. Thus, maintaining the gravity-flow system:

- Keeps energy use and operating costs low because power is not required for additional pumping facilities.
- Increases water system reliability because water can continue to flow even when power may not be available.
- Allows the system to be more sustainable and have a smaller carbon footprint.

Local, State, and Federal Standards

The project is designed to meet Water Bureau and OHA level of service goals related to production capacity and water quality, accommodate future demand for water from population growth in the region, and better respond to potential water quality events such as fires, landslides, algae blooms, large storms, volcanic events, and fires that may potentially affect the watershed.

The project is designed to accommodate a future capacity of approximately 220 million gallons per day (mgd). The structural, electrical, and mechanical systems are designed to meet codes, standards, and guidelines from the State of Oregon, the American Society of Civil Engineers, and other regulatory agencies and advisory bodies that establish requirements and guidelines for designing seismically resistant structures.

Project design parameters also include compliance with applicable county land use and environmental zoning requirements. Project facilities are located in the Multnomah County MUA-20, RR, EFU, and CFU

zones, SEC-wr and SEC-h overlay zones, and the Geological Hazard (GH) overlay zone. An emergency access road is located in the Clackamas County EFU zone.

Each of these zones and overlay zones has unique requirements and review standards that influenced the location and design of the proposed water facilities. Finally, the project design changed substantially to be responsive to feedback received during the Water Bureau's public engagement process, described in more detail at the end of this Introduction.

Project Scope and Components

As shown on Figure 4, the proposed project is located in two counties and includes the following water facilities and appurtenances:

- The 135 mgd drinking water filtration facility and a communications tower, located on a 94-acre site in the Multnomah County Multiple Use Agriculture (MUA-20) zone and served by Carpenter Lane with an emergency access road in Clackamas County;
- Two raw water (RW) pipelines in Multnomah County that extend approximately 0.4 miles from existing conduits along Lusted Road just north of the county line to the filtration facility, through areas zoned Rural Residential (RR) and Exclusive Farm Use (EFU);
- Two finished water (FW) pipelines that extend approximately 1.5 miles in the MUA-20 zone from the filtration facility to the finished water intertie. Both FW pipelines are entirely in the existing Dodge Park Boulevard right-of-way (ROW) except for two lots, one on Carpenter Lane and one on Lusted Road;
- The FW intertie located on Lusted Road east of Altman Road in an area zoned MUA-20;
- Three pipelines located entirely in existing county ROW through areas zoned MUA-20 and EFU, that extend from the intertie various distances to connect with existing conduits: one at Altman Road and Lusted Road, one at Altman Road and Pipeline Road, and one at Altman Road and Oxbow Drive; and
- The Lusted Hill Distribution Main (LRDM), connects the new pipelines in Dodge Park Boulevard to the existing main adjacent to the Lusted Hill Treatment Facility (LHTF) on Cottrell Road. This main will supply water to existing local water customers and five wholesale water districts. The 0.6-mile main travels within the Cottrell Road ROW in the MUA-20 zone then crosses the Water Bureau property in the Commercial Forest Use (CFU) zone and connects to the existing main in an adjacent easement.

Required Project Land Use Permits

The proposed project requires land use permits from both Multnomah and Clackamas counties. In Multnomah County, the project includes the filtration facility, related pipelines and appurtenances, the finished water intertie (intertie), and a communications tower. In Clackamas County, the only proposed project improvement is the emergency access road. As discussed below, the geographic extent of inter-related project elements was a key factor in determining (a) the narrative organizational scheme, and (b) the study area.

Figure 4 shows area zoning and required land use permits in both counties.

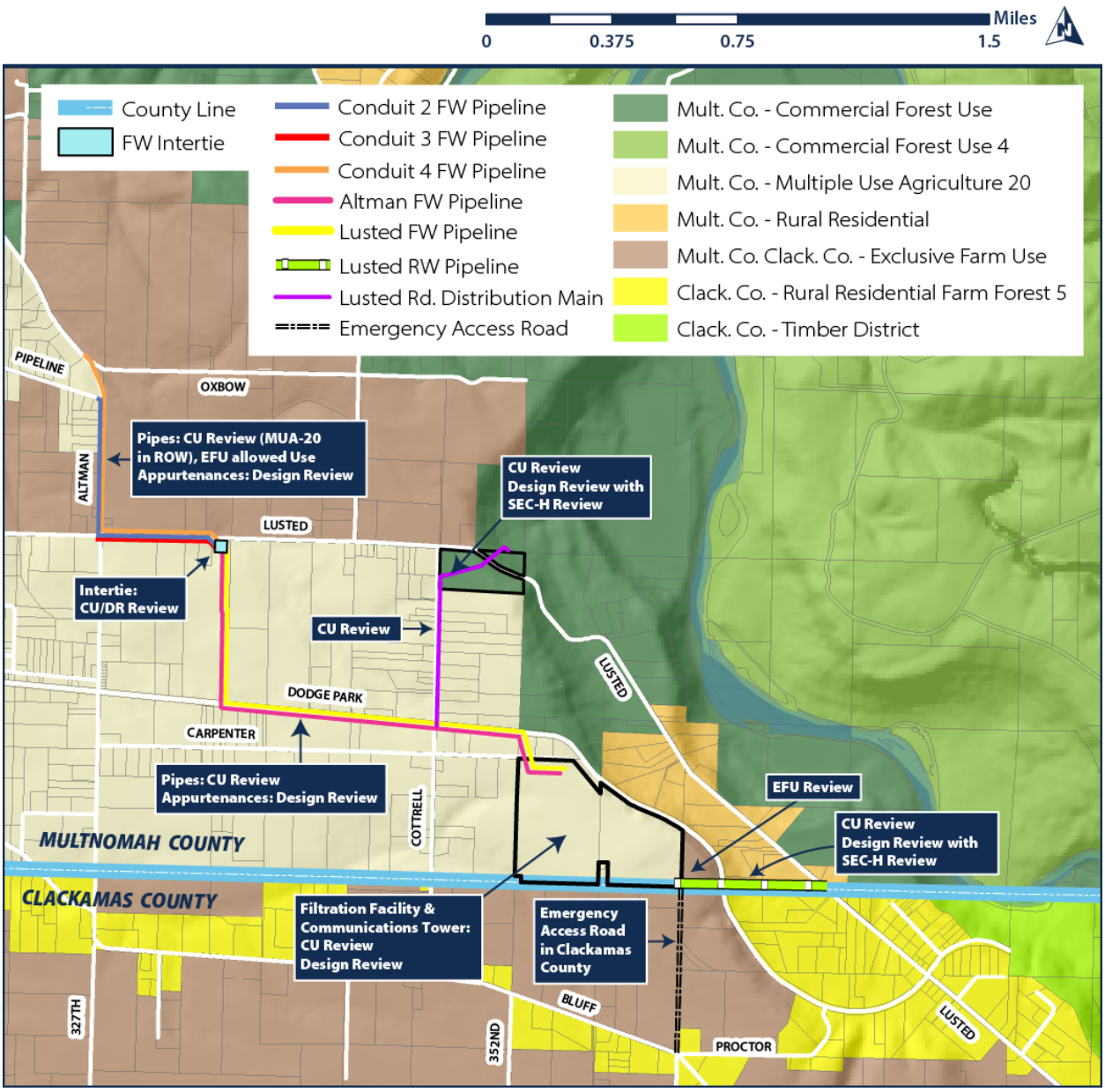

Figure 4. Project Location, Base Zoning, and Land Use Permits

Consolidated Applications and Narrative Organization

With this narrative, the Water Bureau is applying for a set of land use reviews for the project, identified below, to be reviewed through a consolidated Type III land use procedure in Multnomah County pursuant to MCC 39.1105(F).

- An application form is provided in Appendix P.1.
- Erosion and Sediment Control application packages will be submitted separately.
- Due to the scope and complexity of this consolidated project, and to ensure final completion of all construction activities can be achieved, including implementing any conditions of approval that may extend construction schedules, pursuant to MCC 39.1195(E)1 the Water Bureau requests an alternative seven-year completion of construction expiration date for those portions of the project in the MUA-20 and RR zones (the exception lands under MCC 39.1195(E)), in place of the typical project four-year completion of construction expiration date set forth in MCC 39.1195(B)(2).2

This Introduction provides basic facts and context for the consolidated Type III land use applications in Multnomah County. The narrative is organized as follows:

Section 1 – Filtration Facility Site Overview addresses MUA-20 base zone use and procedural requirements, lot of record requirements, and addresses accessory use standards. Section 1 also includes background information and narratives in support of approval for the following land use permits:

- **Section 1.A:** Conditional Use Permit (CUP) for the filtration facility – a community service use (a CS use) in the MUA-20 zone;
- **Section 1.B**: Design Review (DR) for the filtration facility in the MUA-20 zone; and
- **Section 1.C:** Communications Tower CUP and Design Review in the MUA-20 zone.

Note: Proposed filtration facility development avoids the SEC overlay zones as they apply to the filtration facility site.

[1] MCC 39.1195(E) provides "Notwithstanding Subsections (A), (B), or (C) of this section, on exception lands the decision maker may set forth in the written decision specific instances or time periods when a permit expires."

[2] MCC 39.1195(B) provides, as relevant: "[A] Type II or Type III land use approval issued pursuant to this Chapter for a use or development that includes a structure shall expire as described in 1 or 2 below: (1) When construction has not commenced within two years of the date of the final decision. Commencement of construction shall mean actual construction of the foundation or frame of the approved structure. For utilities and developments without a frame or foundation, commencement of construction shall mean actual construction of support structures for an approved above ground utility or development or actual excavation of trenches for an approved underground utility or development. For roads, commencement of construction shall mean actual grading of the roadway. (2) When the structure has not been completed within four years of the date of commencement of construction. Completion of the structure shall mean completion of the exterior surface(s) of the structure and compliance with all conditions of approval in the land use approval."

Section 2 – Pipelines and Appurtenances Overview addresses MUA-20, CFU, EFU, and RR base zone use and procedural requirements for pipelines and appurtenances, including the intertie building, lot of record, and geologic hazards permit requirements. Section 2 also includes conditional use, design review, and SEC background information and narratives in support of approval of the following land use permits:

- **Section 2.A:** CUPs for connecting CS uses (pipelines, appurtenances, and the intertie) in the MUA-20, CFU, and RR zones;
- **Section 2.B:** DR for pipelines in the RR, EFU, MUA-20, and RR zones;
- **Section 2.C:** EFU Review for utility facilities necessary for public service (pipelines and appurtenances in EFU zone outside of public street ROW);
- **Section 2.D:** SEC Reviews for pipelines and appurtenances within the SEC-h overlay zone.

This Introduction applies to both Sections 1 and 2 of this narrative. The diagram below summarizes the organizational framework for this narrative.

Applications Narrative Guide		
	INTRODUCTION	
	SECTION 1: FILTRATION FACILITY SITE OVERVIEW	
	Section 1.A	Filtration Facility – Conditional Use Application Narrative
	Section 1.B	Filtration Facility – Design Review Application Narrative
	Section 1.C	Communications Tower – Conditional Use & Design Review Application Narrative
	SECTION 2: PIPELINES OVERVIEW	
	Section 2.A	Pipelines – Conditional Use Application Narrative
	Section 2.B	Pipelines – Design Review Application Narrative
	Section 2.C	Pipelines – EFU Review Application Narrative
	Section 2.D	Pipelines – SEC Review Application Narrative

Rationale for Consolidated Project Study Area

This subsection identifies and describes the boundaries of the study area (see Figure 9), summarizes land use characteristics of the study area, and discusses how the area has developed and changed over the last 50 years. In **Section 1** (related to the filtration facility site) and in **Section 2** (related to the pipelines and intertie), core analysis areas for specific potential impacts of project components are described.

The project includes the filtration facility, the communications tower, the intertie, an emergency access road, and approximately three miles of connected underground pipelines spanning an area west of the Sandy River.

- Because project facilities extend through and have the potential to affect people and properties in two counties, the proposed study area includes land in both Multnomah and Clackamas counties. The study area boundary is large enough to consider all areas where the externalities or sensitivities of the proposed use could potentially have impacts, as described in more detail in the following sections of this Introduction.
- As many of the land use applications for the project require an analysis of the area potentially impacted by the project, and because of the consolidated nature of the procedure for review of these applications, the Water Bureau identified a consolidated, unified study area. This study area ensures that the analysis is comprehensive and does not fail to consider cumulative impacts across the project, even where components of the project are subject to separate land use applications.

Study Area Based Primarily on Transportation Impacts

Because the filtration facility itself will be quiet, odorless, safe, and relatively unobtrusive with extensive visual screening as demonstrated in **Section 1.A**, the main potential for off-site impacts relates to the transportation intersections and roadways analyzed in the TIA found in Appendix C.1.

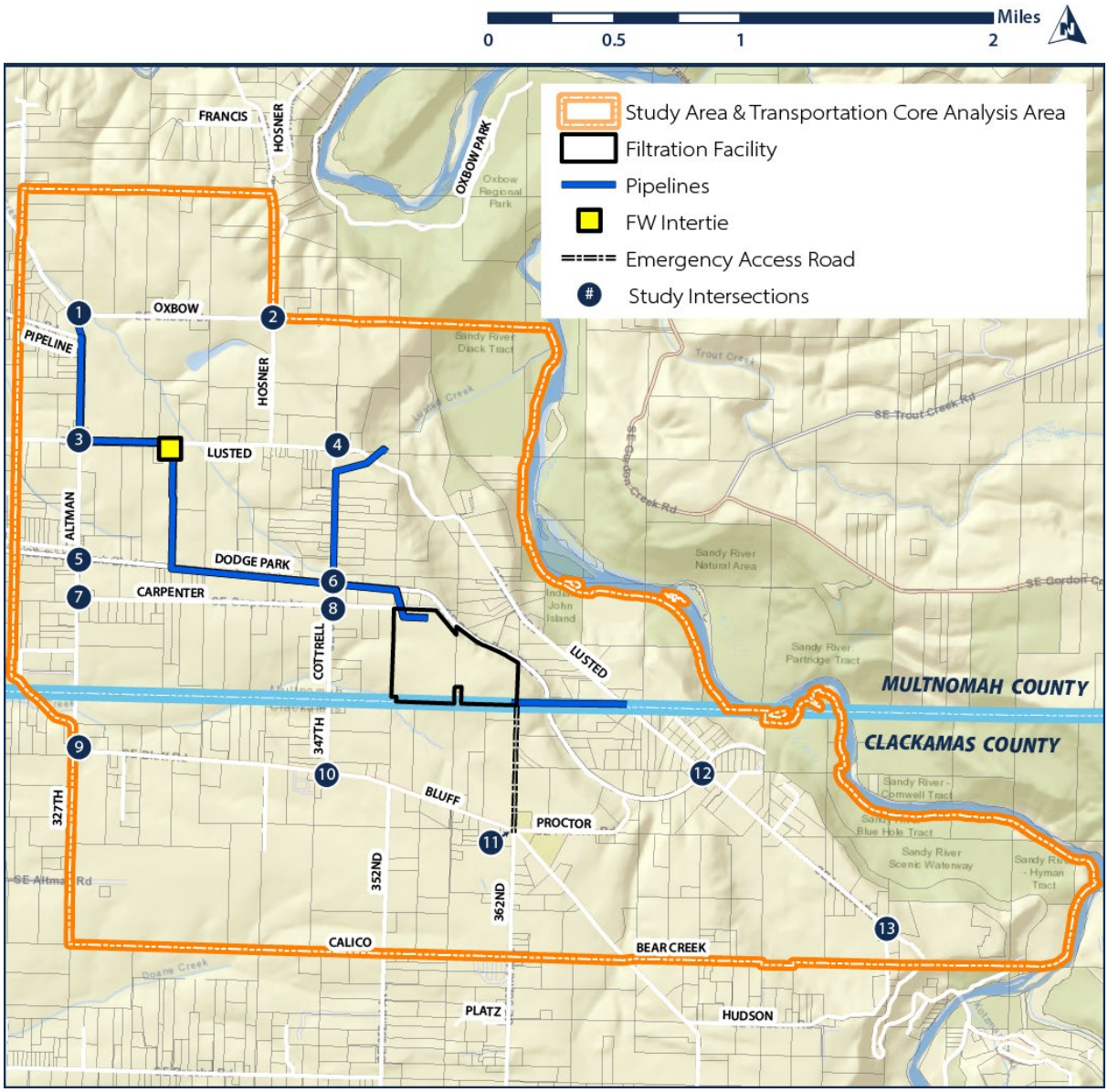

Figure 5. TIA Core Analysis Area—Showing Roads and Intersections Analyzed

Figure 5 shows the intersections analyzed in the TIA and the project study area. The transportation engineer chose these intersections because they could be affected by project operations based on his professional judgment and in response to feedback received during the Water Bureau's public engagement process.[3] The Multnomah County Transportation Planning & Development Department reviewed and approved the thirteen intersections included in the TIA, as documented in Appendix O.2b Multnomah County Transportation Comments, page 4.

[3] Based in part on community comments, TIA intersections studied increased from seven to thirteen.

Water District Service Areas Considered

Figure 6 shows cities and water districts within five miles of the filtration facility site served by the Bull Run water system. The project will improve water quality and reduce risks from waterborne bacteria for customers served by these cities and water districts. The Pleasant Home and Lusted Water Districts serve residential and business customers generally west of the proposed filtration facility, many of which are within the study area boundary.

The PHWD and the Lusted Water District service areas are shown in blue. The filtration facility site is shown in orange—near the eastern edge of the PHWD service area. The service areas of both these water districts were considered in determining the study area boundary shown on Figure 9. All but the western extension of the PHWD service area is included within the proposed study area (the western edge of the study area boundary is defined by 327th and 322nd Avenues). The southeastern portion Lusted Water District service area (northwest of the PHWD service area) is also within the project study area shown on Figure 9.

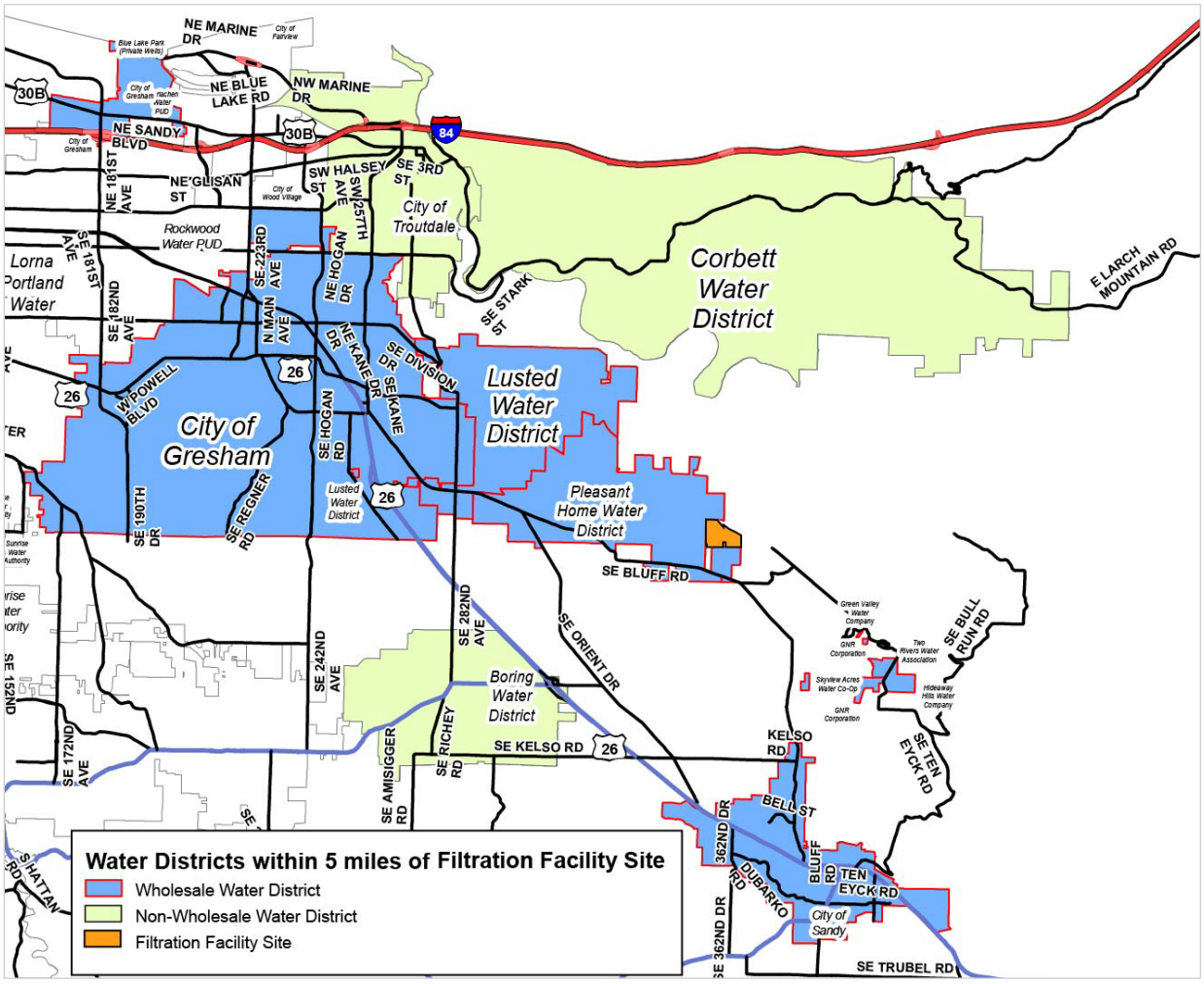

Figure 6. Cities and Water Districts to be Served by the Proposed Filtration Facility

Nursery Operational Centers and Related Nursery Fields

To ensure that potential agricultural impacts are fully considered, the study area also is large enough to include nursery crop land and associated wholesale nursery operational centers and agricultural processing operations. The study area includes several nearby moderate- to large-scale nursery operations and associated fields. Most nurseries own or lease land for growing nursery stock, and typically own land that accommodates more intensive office, storage, processing, and distribution facilities.[4]

For example, Figure 7 is copied from Appendix D.1 and shows the Surface Nursery headquarters (operations center) on Lusted Road and land that is owned or leased by Surface Nursery for growing nursery crops. Surface Nursery's 12 identified field locations extend to the area south of Proctor and Bluff roads immediately north of Lusted Road (near the LHTF) and west of Altman Road.[5]

Figure 7. Surface Nursery Headquarters and Field Crop Locations

[4] As documented in Appendix D.1, several smaller nursery operations and fields also are located in the study area.

[5] Field locations were identified in early 2021 and may change based on lease arrangements and other factors.

As documented in Appendix D.1, the relationships between nursery headquarters and nursery cropland are similar for Sester Farms and J. Frank Schmidt nurseries.

- Sester Farms nursery headquarters is located north of Oxbow Drive, with four satellite operational centers and 13 field locations extending from east of Lusted Road to both sides of Oxbow Drive.
- J. Frank Schmidt Nursery headquarters are located on 357th Avenue (the extension of Altman Road) with field locations concentrated near the intersection of Bluff and Altman roads.

Section 1.A of this narrative, Appendix D.1 and Appendix O.1 identify and describe the characteristics of additional nursery operations in the study area.

Views of the Filtration Facility and Intertie Sites

As shown on Figure 8, the existing PHWD storage tanks are clearly visible from Bluff Road. The tanks are also visible from other areas as documented in **Sections 1.A and 1.B**. Both sections provide a more detailed analysis of potential filtration facility view impacts, and **Section 1.C** explains how potential view impacts from the proposed communications tower are mitigated. **Section 2.A** provides a more detailed analysis of potential view impacts from the intertie structure near Lusted Road. The study area shown on Figure 9 is designed to be large enough to include these potential viewshed impact areas.

As described in more detail in the sections referenced above, visual impacts are mitigated through a variety of design measures including extensive building and parking setbacks, placement of buildings and structures in the lower area of the site, and land placement of landscape berms and plantings.

Figure 8 is a computer-generated graphic showing the existing PHWD storage tanks and the proposed filtration facility buildings and communications tower viewed from Bluff Road, about a half-mile to the south. The color and bulk of the existing water tanks makes them easier to see than the proposed communication tower (barely visible immediately northeast of the tanks), which is designed and painted to blend in with the adjacent trees and the sky. The filtration facility is also barely visible to the left of the PHWD tanks, in part because it will be placed in a lower area of the site.

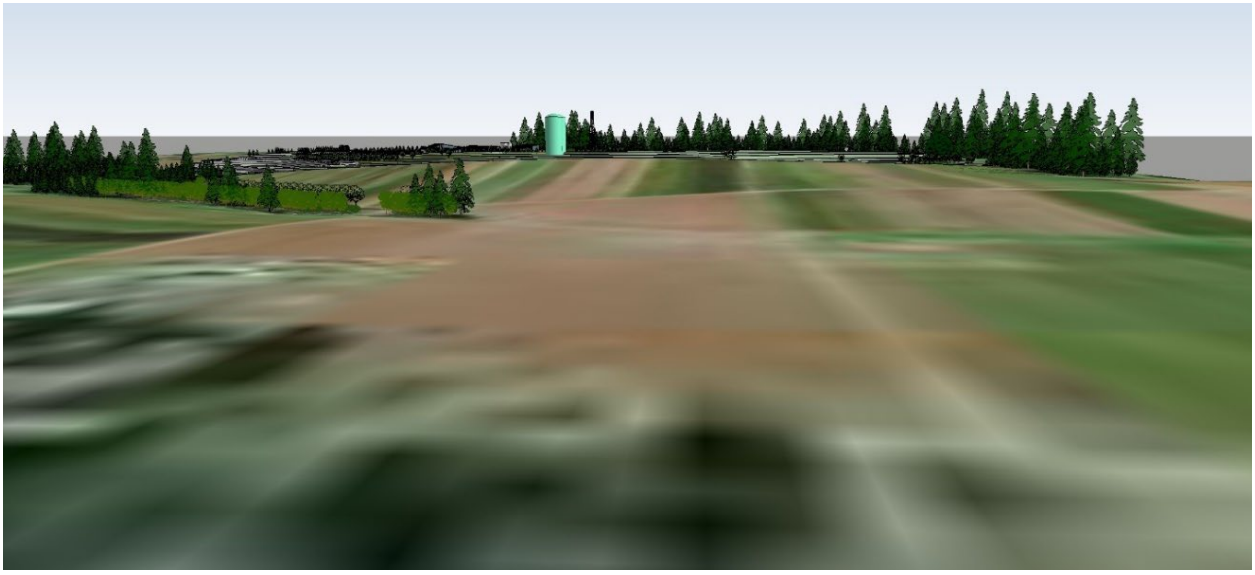

Figure 8. View of Existing PHWD Tanks and Proposed Filtration Facility Structures Looking North from Bluff Road

Other Potential Impact Categories

In addition to traffic, views, and agriculture, participants in outreach meetings have raised concerns related to potential lighting, noise, hazardous materials, olfactory, and water and air quality impacts from project operations. Each of these potential impact categories has been analyzed as part of the planning and design of the project, but none has a potential for an impact area larger than the study area created by considering traffic, views, and agriculture.

Study Area Boundary

Figure 9 shows the project's consolidated study area. As described above, this study area is designed to be large enough to include the entire project as well as all areas where the externalities or sensitivities of the proposed use could potentially have impacts, with the potential transportation and agricultural impact categories driving the study area boundaries. The study area includes the filtration facility, communications tower, an emergency access road from Bluff Road, the intertie on Lusted Road, and related raw and finished water pipelines. The boundaries of the study area take into consideration roadways and topographical features which clearly divide areas of the counties.

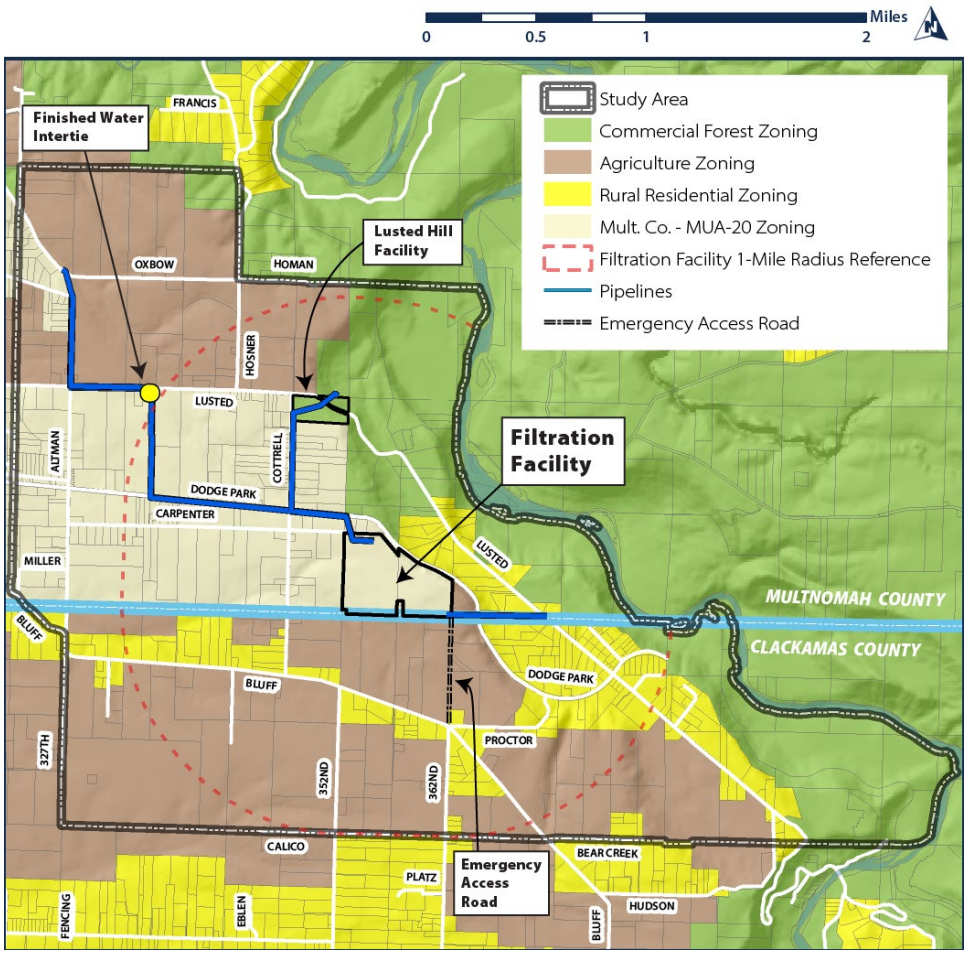

Figure 9. Consolidated Land Use Study Area with Generalized Zoning

Moving counterclockwise from the northwest corner, the study area boundaries are described below:

- **Northern Boundary**: The western portion of the northern boundary includes large EFU parcels abutting and immediately north of Oxbow Drive used for growing crops and more intensive nursery operational facilities. The eastern portion of the northern boundary is defined by Holman Road extended due east to the Sandy River.
- **Eastern Boundary**: The Sandy River defines the eastern boundary of the study area. The steep Sandy River bluff and inherent disruption of the street network by the river itself separates land east of the river from potential impacts west of the river.
- **Southern Boundary**: The southern boundary is defined by Bear Creek and Calico roads near the southern edge of the one-mile radius from the filtration facility. This area to the south of the filtration facility site includes the emergency access road to the filtration facility, crop land, nursery operations, a large solar facility, and rural residential areas in Clackamas County served by Bluff Road.
- **Western Boundary**: The southern portion of the western boundary is defined by 327th Avenue, a major road near the western edge of the one-mile radius from the filtration facility. The western boundary follows Bluff Road northwest to align with two roads and property lines west of the northern pipeline terminus.

To provide context, land within a one-mile radius of the filtration facility site is shown with a dashed red line in Figure 9.[6]

Study Area Land Use Summary

As shown on Figure 9 and Table 1 below, two-thirds of the study area is designated for resource (farm and forest) use and zoned CFU, TBR, or EFU. The remaining third is designated as rural residential exception areas and zoned RRFF-5, RR, or MUA-20. Forest land within the study area is concentrated in steeply sloped areas west of the Sandy River and comprises 20 percent of the study area. Zoning in the western portion of the study area has predominantly EFU zoning (over 2,000 acres) with large concentrations of rural residential zoning (over 1,500 acres).

In both counties, development that is not related to farm or forest uses is highly restricted in the EFU and commercial forest zones. Community service / utility uses (including water facilities) are permitted through the CUP process in residential and multiple use zones, but state law permits "utility facilities for public service" on EFU-zoned land only where there are no practicable alternatives.

The proposed filtration facility is located on land zoned MUA-20 in part because the MUA-20 zone is **not** an EFU or commercial forest zone. Although the MUA-20 zone allows agriculture as an outright allowed use, it is not a zone that implements Statewide Planning Goal 3 (Agricultural Lands) protection

[6] A one-mile radius exceeds the 1,320-foot impact area radius Multnomah County analyzed in the Water Bureau's Lusted Hill Facility review (Appendix 0.3, T3-2019-11784), which radius appears to be related to the area required for reviews in the Columbia River Gorge National Scenic Area under MCC 22.18.050. A one-mile radius reference is established in Multnomah County Code for solar facility study areas in EFU zones and therefore was a logical reference point for the project study area, which includes EFU lands. MCC 39.4230(U)(10). As described in this Introduction, the study area for the project was designed based on the potential impact areas and therefore is larger than in the Water Bureau's previous Lusted Hill Facility application and larger than the 1-mile reference radius.

requirements, which is why it can and does allow residential development outright as well. The proposed pipelines intentionally run through these exception areas (MUA-20 and RR) wherever practicable to avoid areas zoned for resource use.

The MUA-20 zoned area, despite being a non-resource zone, includes large- and small-scale agricultural operations and large- and small-lot rural residential development.

Table 1. Study Area Zoning Composition

Generalized Zoning		County	Zone	Acres	Percent of Study Area
Resource Land	Commercial Forest Zones	Multnomah	Commercial Forest Use (CFU)	576	12%
		Clackamas	Timber District (TBR)	358	8%
	Agricultural Zones	Multnomah	Exclusive Farm Use (EFU)	717	15%
		Clackamas	Exclusive Farm Use (EFU)	1,392	29%
Resource Land Subtotal				3,043	64%
Exception Areas	Residential and Multiple Use Zones	Multnomah	Rural Residential (RR)	103	2%
			Multiple Use Agriculture-20 (MUA-20)	1,088	23%
		Clackamas	Rural Residential Farm Forest-5 (RRFF-5)	540	11%
Exception Areas Subtotal				1,731	36%
TOTAL				4,774	100%

Rural Residential Characteristics

Rural residences help to define the character of the study area. Rural residences are found in all study area zones, but predominantly in rural residential exception areas. Based on GIS analysis, there are approximately 370 homes in the study area (this includes both rural exception area homes and farm- and forest-related dwellings). As documented in Appendix O.1 and **Section 1.A**, the age, size, style, and appearance of homes and accessory structures and outdoor storage areas in the study area vary greatly.

Existing Nursery and Agricultural Processing Operations and Public Facilities

According to the Oregon Association of Nurseries[7]:

> *"Oregon is one of the top three nursery production states in the nation (USDA Census of Horticultural Specialties, 2019). Oregon growers sold an estimated $1.19 billion worth of nursery and greenhouse products, setting an all-time record, and that doesn't include Christmas trees (Oregon Department of Agriculture, 2021). What's more, nursery/greenhouse products have ranked as Oregon's number one agricultural commodity in sales for eight of the last 10 years.*
>
> *Nurseries are an important traded sector, bringing dollars back to the state that translate into jobs that Oregon otherwise might not have. Nearly three-fourths of Oregon's nursery sales come from outside Oregon. The Oregon nursery industry, including Christmas trees, employs an average of 9,794 workers in horticultural production, with a total annual payroll of $372 million (Oregon Employment Department, 2021). Nursery workers earn an average of $38,019 per year."*

As stated in Appendix D.1, the area's marine climate favors the production of ornamental nursery crops and economic pressures have favored larger growers. Larger farms are able to achieve profitable economies of scale through up-front technology investments, larger labor workforces, and increased farmland acreages. High product demand and these competitive advantages have moved existing farmland in the area into consolidated management, with centralized headquarters surrounded by multiple fields in nursery production. Mid- to large-scale nursery centers typically have large building footprints to accommodate storage and processing structures, marketing and businesses offices, greenhouses, and loading and parking facilities, and employ a large, year-round workforce. As documented in Appendix D.1, nursery operations occupy approximately 80 percent of the farmland in the study area.

However, unlike public facilities which are reviewed through the more demanding CUP process, nurseries of any size are allowed outright in the MUA-20 zone with no public notice or public hearing.[8] Wholesale and retail sales nursery operations are allowed outright in EFU zones and permitted as a "review use" approved by the Planning Director in the MUA-20 zone.[9] As shown in Table 2, the R&H Nursery and Surface Nursery headquarters are zoned MUA-20.

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[7] Source: Oregon Association of Nurseries (OAN) website. https://www.oan.org/page/economicforce#:~:text=The%20Oregon%20nursery%20industry%2C%20including,average%20of%20%2438%2C019%20per%20year.

[8] MCC 39.4310 provides, as relevant here: "ALLOWED USES. The following uses and their accessory uses are allowed, subject to all applicable supplementary regulations contained in MCC Chapter 39. ... (B) Farm uses, as defined in ORS 215.203 (2) (a) for the following purposes only: (1) Raising and harvesting of crops; (2) Raising of livestock and honeybees; or (3) Any other agricultural or horticultural purpose or animal husbandry purpose or combination thereof, except as provided in MCC 39.4320(B)."

[9] MCC 39.4315 provides, as relevant here: "REVIEW USES. The following uses may be permitted when found by the approval authority to satisfy the applicable standards of this Chapter. … (B) Wholesale or retail sales of farm or forest products raised or grown on the premises or of farm crops or livestock from other farm operations located in Multnomah County or in adjacent counties of Oregon or Washington bordering on Multnomah County, subject to the following condition: The location and design of any building, stand or sign in conjunction with wholesale or retail sales shall be subject to approval of the Planning Director on a finding that the location and design are compatible with the character of the area."

The study area also includes mid- to large-scale agricultural processing operations such as Scenic Fruit Company (fruit processing), Stargazer Farms (produce and marijuana), and Glendale Farms (mulch processing).

To a lesser extent, public facilities also define the character of the study area. Figure 10 shows the location of eight mid- to large-scale nurseries and agricultural processing operations (shown in dark blue) and four prominent public facilities within the study area (shown in light blue). Smaller Water Bureau facilities not shown in this map include surge tanks off Hosner Road (northwestern portion of the study area) and the Hudson Intertie (southeastern portion of the study area).

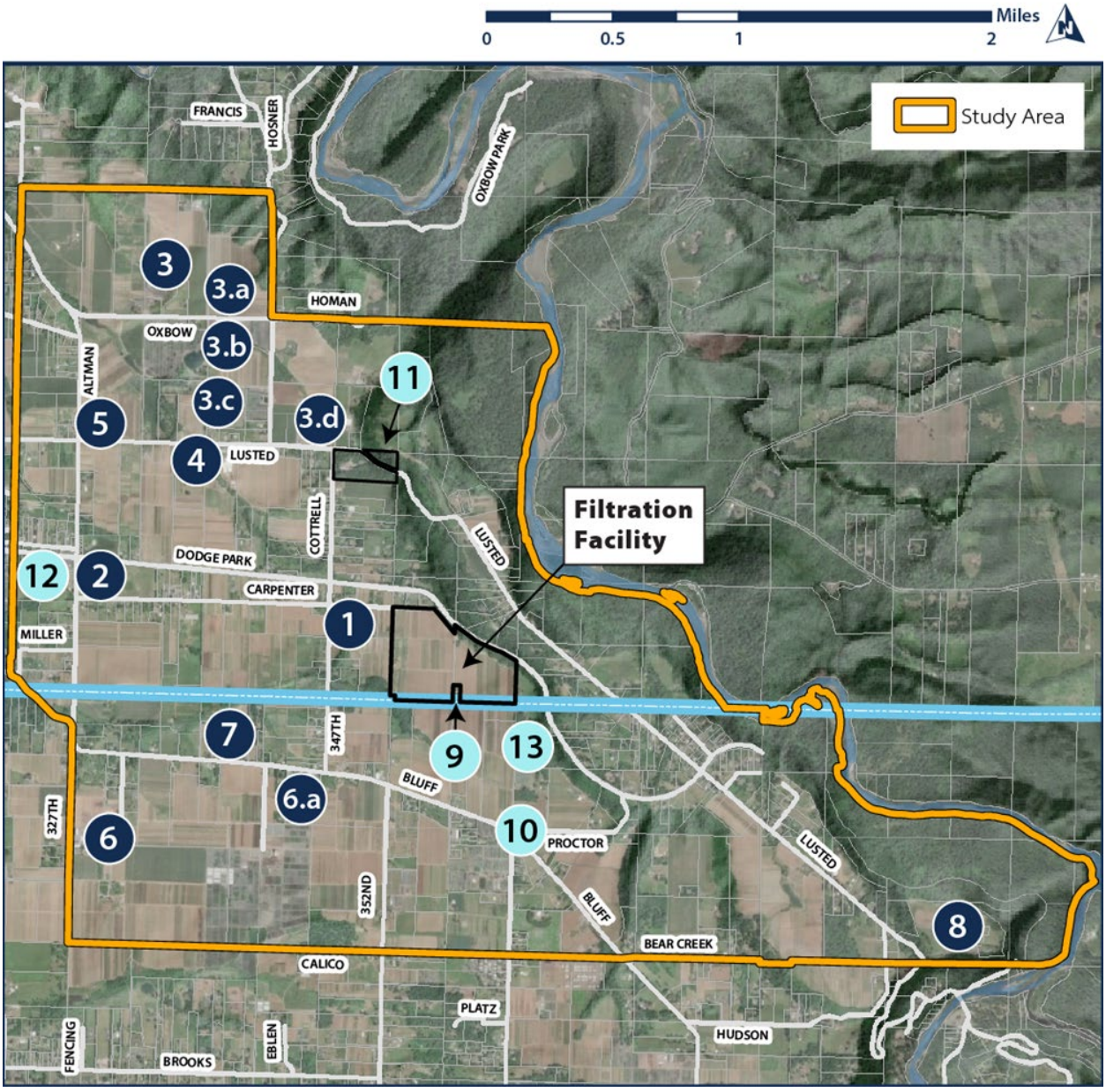

Figure 10. Existing Nursery Operations and Public Facilities in the Study Area (key in Table 2)

Table 2 provides the street address and estimated above-ground building coverage (building footprint) of each numbered facility.[10] Estimated above-ground building footprints range from just under 15,000 sf (R&H Nursery) to over 245,000 sf (J. Frank Schmidt & Son Co.).

Table 2. Nursery and Agricultural Processing Operations and Public Facilities in the Study Area

Mid- to Large-Scale Nursery or Agricultural Processing Operations			
Map #	**Nursery or Processing Name**	**Zoning**	**Estimated Building Footprint (sf)**
1.	R & H Nursery (34826 Carpenter Lane)	MUA-20	14,950 w/ 4 greenhouses
2.	Scenic Fruit Co. (7510 Altman Road)	MUA-20	54,200
3, 3a-d.	Sester Farms (5 locations - Oxbow, Hosner, and Lusted roads)[9]	EFU	143,650 w/ 28 greenhouses
4.	Surface Nursery (33740 Lusted Road)	MUA-20	89,700 w/ 5 greenhouses
5.	Glendale Farms (32801 Lusted Road)	EFU	24,900
6, 6a.	J. Frank Schmidt & Son Co. (2 locations – 327th Avenue and Bluff Road)[10]	EFU	245,550 w/ 94 greenhouses
7.	T.H. Belcher Nursery Inc. (33755 Bluff Road)	RRFF-5	21,150
8.	Stargazer Farm (39391 Lusted Road)	TBR	80,850
Total Nursery or Processing Building Coverage			674,950*
Public Facilities			
Map #	**Facility Name**	**Zoning**	**Estimated Building Footprint (sf)**
9.	Pleasant Home Water District Tanks (35524 Carpenter Lane)	MUA-20	2,000
10.	Oregon Trail Academy (36225 Proctor Road)	RRFF-5	46,000
11.	Lusted Hill Treatment Facility (6704 Cottrell Road)	CFU	4,100
12.	Electrical Substation (SW of intersection of Altman Road and Dodge Park Boulevard)	RR	Building sq. ft. N/A; above ground electrical facilities cover about 35,000 sf.
13.	Photovoltaic Solar Power Generation Facility (36461 Proctor Road)	EFU	12 acres of above ground solar modules

[10] Winterbrook used a combination of GIS and aerial analysis to estimate building footprints. Building footprints are one way to measure potential visual and transportation impacts from a nursery or public facility.

* Table 2 does not show low-profile or below-ground development, such as parking and loading areas, outdoor storage areas, or low-profile utilitarian structures such as storage tanks or basement facilities. Temporary and permanent greenhouses (131 separate structures) coverage estimates are not included in building footprint estimates.

Potential Nursery and Public Facility Operational Impacts

As documented in Appendix O.1 and **Section 1.A** of this multi-part application narrative, building footprints are just one indicator of potential impacts on surrounding land uses. For example, the number of employees at the nursery or public facility is indicative of transportation impacts. Nursery operations and public facilities can have a relatively small footprint and still have adverse transportation and visual, lighting, noise, and traffic impacts on surrounding land uses. Building design is also an important consideration when evaluating compatibility with nearby rural residential land uses. Other factors that can exacerbate or mitigate adverse impacts include building setbacks, parking location and design, lighting, noise, and screening from public and private views.

Nurseries contribute substantially to the regional economy and provide hundreds of jobs. Nursery operations often have adverse visual, transportation, noise, dust, chemical drift, light, and other impacts on surrounding residential and other uses. However, because nursery operations are agricultural uses and are not reviewed through the CU process, their external impacts are often not effectively mitigated. Thus, the character of the area is in part defined by these existing nursery operational impacts.

Public facilities (including public utilities, schools, and solar facilities) contribute to the health and well-being of people in their service areas. These facilities could, in the absence of effective mitigation measures, also have adverse visual, transportation, and other impacts on residential and other uses in the study area. However, because public facilities must be reviewed through the county's CUP review process, external impacts from these facilities usually are mitigated through design measures and conditions of land use approval. Thus, public facilities typically have fewer adverse impacts on residential and other uses in the surrounding area than do nursery operations.

Examples of Nearby Nursery Operational Centers

Two Lusted Road nursery operational centers and the LHTF are pictured and described below.

Figure 11. Sester Farms Nursery Operations Center (34519 Lusted Road identified as #3.d on Figure 10)

Figure 11 shows Google and field outing photos of Sester Farms' main production center (identified as #3.d on Figure 10), just north and west of the LHTF near the intersection of Cottrell and Lusted roads. The site is zoned EFU. The operational center includes nine warehouse and processing buildings, six greenhouses, a semi-trailer truck loading area, and approximately 109 onsite employee parking spaces. These buildings have a combined footprint of roughly 92,000 sf (not including greenhouses) and have white-metal gabled roofs and either beige or tan metal siding. This combined building footprint of the above-ground buildings (not including six large greenhouses) on the site is comparable to the footprint of the above-ground filtration facility buildings (not including low-profile utilitarian structures);[11] however, the operational center provides (and likely requires based on the number of trips) considerably more employee and visitor parking than the filtration facility.

Figure 12. Surface Nursery (33740 Lusted Road identified as #4 on Figure 10)

Figure 12 shows Google images of Surface Nursery's operational center (identified as #4 on Figure 10), which is located between the LHTF and the proposed finished water intertie on Lusted Road. The site is zoned MUA-20. The operational center has ten farm buildings, five greenhouses, and loading and outdoor storage areas. The farm building footprints (excluding greenhouses) total about 90,000 sf, which is comparable to the square-footage of above-ground office and storage buildings at the filtration facility. The buildings have white metal gabled and shed roofs and have beige or brown metal siding. Employee parking is provided in the Lusted Road ROW. Buildings and parking areas are not screened from Lusted Road. As discussed in **Section 1.A**, Surface Nursery has 35 employees, which is comparable to the 26 employees at the filtration facility.

11 As documented in Appendix 1.A, the proposed filtration facility includes 94,601 sf of above-ground building coverage, not including utilitarian structures used for water processing.

Lusted Hill Treatment Facility

Figure 13 shows the LHTF (identified as #11 on Figure 10). The facility is located near the Sester Farms' main operational center, and just over a half-mile north of the proposed filtration facility. The bottom right Google image shows the LHTF entrance looking east from Cottrell Road. A surge tank at the entrance was constructed in the 1990s and painted dark green to blend with existing evergreen trees. LHTF structures are barely visible through the forested area along Cottrell Road.

The top and bottom left images (provided by the Water Bureau) show LHTF structures (approved by Multnomah County in 2017) looking northwest from the interior of the site. The LHTF has a small (4,800 sf) operations building painted beige and green, two 50-foot-tall white soda ash silos, a communications tower, and seven employee parking spaces. These facilities are screened from both Cottrell and Lusted roads by forested land. The communications tower is screened by tall trees. As required by county code, the tower is painted dark green to match existing evergreen trees at the base, and silver to blend in with the sky above tree level.

Figure 13. Lusted Hill Treatment Facility (6704 Cottrell Road #10)

Natural Features and Environmental Overlay Zones

Figure 14 shows planned project facilities in relation to Multnomah and Clackamas County environmental overlay zones and to natural features in the study area.

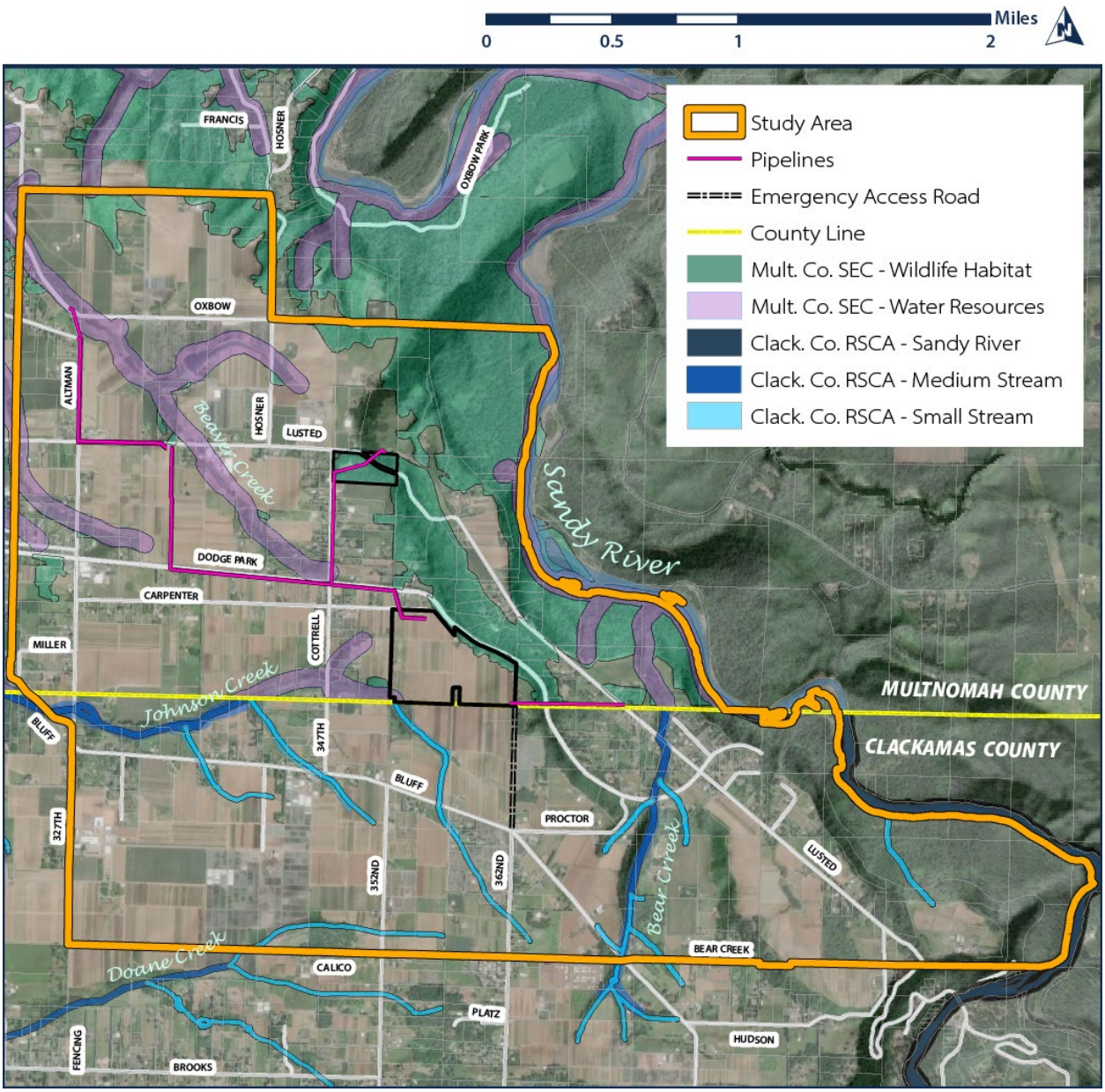

Figure 14. Project in Relation to Multnomah and Clackamas County Environmental Overlay Zones

In the eastern portion of the study area, the Sandy River bluff area is steeply sloped and forested, except for the rural residential bench along Lusted Road. This area drains generally east to the Sandy River. The remainder of the study area west of the Sandy River bluff is characterized by rolling hills with a combination of agricultural and rural residential uses. This area is within the Beaver Creek, Doane Creek, Johnson Creek, and Bear Creek drainage basins.

Environmental Overlay Zone Impact Avoidance

The project is designed to avoid environmental overlay zones where possible and minimize its impact on protected natural resources where avoidance is not possible. Twenty percent of the bi-county study area (4,781 acres) is subject to environmental overlay zones (959 acres).

Within these overlay zones, water areas and vegetated riparian and upland areas are the most sensitive to development impacts. The project has about four miles (21,700 lf) of pipeline corridor—with approximately seven and a half miles (40,500 lf) of pipelines within that corridor—of which 2,770 lf must pass through environmental overlay zones because there is no reasonable alternative.

The project is designed to avoid disturbance of all significant vegetation and water areas in environmental overlay zones:

1. First, by choosing pipeline routes that navigate around these overlay zones;
2. Second, if avoidance is not feasible, by constructing pipelines in existing ROW or cleared areas outside of ROW that do not have riparian vegetation or water areas; and
3. Third, if pipelines must pass through vegetated or water areas, then by placing pipelines in tunnels bored beneath forested and water areas.

Through these efforts, the project will not disturb any significant vegetation or water areas in environmental overlay zones.

Table 3 shows the total acreage of land with environmental overlay zoning in the study area, the linear feet of pipelines that must pass through environmental overlay zones, and the vegetated and water resource areas of each zone that will be impacted by the project.

Table 3. Impacted Environmental Overlay (E-Zoned) Areas within the Study Area

E-Zone Overlays	Study Area with E-Zones	Pipeline Length in E-Zones	Impacted Vegetated & Water Areas within E-Zones
Mult. Co. SEC-h (wildlife habitat)	541 acres	1,978 lf	None
Mult. Co. SEC-wr (water resources)	304 acres	792 lf	None
Multnomah County Subtotal	845 acres	2,770 lf	None
Clackamas County River and Stream Conservation Area (RSCA)	114 acres	0 lf	None
Both Counties Total	959 acres	2,770 lf	None

As demonstrated in **Section 2.D**, the Water Bureau prioritized avoidance of environmental resources throughout the design development process. To avoid disturbing vegetation and water areas in environmental zones, the following methods were applied:

1. trenchless construction (pipes bored below the resource area);
2. placement in public street ROW (pipes constructed below paved road or graveled shoulders); or
3. placement in previously cleared areas (pipes constructed at the LHTF site).

Multnomah County Environmental Overlay Zone Impacts

Detailed evaluations of environmental zone impacts and mitigation measures are found in **Section 2.D** of this application narrative. As shown on Figure 14 and in Table 3:

- **Filtration Facility Site**: Development on the filtration facility site completely avoids the SEC-h overlay zone next to Dodge Park Boulevard on the northeast and the Johnson Creek SEC-wr overlay touching the southwest corner of the site.
- **RW Pipeline**: The RW pipeline extending west from Lusted Road to the filtration facility site must pass through an SEC-h overlay zone. To avoid impacts on vegetated wildlife habitat, the pipeline will be placed in a tunnel bored a minimum of 187 feet below the surface.
- **Lusted Road Distribution Main (LRDM)**: The distribution main connecting the filtration facility to the existing LRDM north of the LHTF must pass through (a) the Beaver Creek SEC-wr overlay and (b) the forested SEC-h overlay. To avoid SEC-wr impacts, the distribution main is located entirely within the Cottrell Road ROW and is bored below the stream and therefore will have no impacts to the stream or riparian vegetation. To avoid SEC-h impacts on and adjacent to the LHTF site, the distribution main will be located in non-forested areas (including the LHTF parking and circulation area) and will be bored below the steep northern slopes of the site.
- **FW Pipeline**: The FW pipeline must connect with an existing conduit in the Beaver Creek SEC-wr overlay. To minimize impacts, the pipeline will be constructed entirely within the Altman and Oxbow ROWs, with no impacts to the stream or riparian vegetation.

Clackamas County Environmental Overlay Zone Impacts

The only proposed project in Clackamas County is the emergency access road. This road will be constructed outside of River and Stream Conservation Areas (RSCAs) and therefore will have no impact on mapped environmental resource areas in Clackamas County.

Public Outreach

The Water Bureau set out early in the project design process to inform and engage community members about the planned water filtration facility and large-diameter pipelines. Initially, the Water Bureau developed a set of project goals and values using input from stakeholder interviews and more than 1,700 survey respondents. The Water Bureau considered these community goals and values when considering project design and locational alternatives for the filtration facility, the intertie, and pipelines and appurtenances.

The Water Bureau's outreach efforts with project neighbors have included mailings, information sessions, and surveys. In fall 2019, the Water Bureau invited project neighbors and stakeholders to participate in a Site Advisory Group process to discuss preferences and concerns. The Site Advisory Group was comprised of filtration facility site neighbors and stakeholders (including the East Multnomah County Soil and Water Conservation District, the City of Sandy, the Johnson Creek Watershed Council, Surface Nursery, and R&H Nursery).

The Site Advisory Group has met regularly between October 2019 and the time of submission of these applications to discuss and share information. The meetings focused on topics of greatest interest to community members and included surveys and other opportunities to provide feedback. These discussions informed development of a Good Neighbor Agreement that documents the Water Bureau's commitments to neighbors during design, construction, and ongoing operation of the filtration facility project. The discussions also informed design development.

The Water Bureau's project outreach also includes ongoing briefings and discussion with a variety of area stakeholders representing environmental, local business, public safety, and other interests to identify and respond to potential concerns with the project. Project briefings were provided to the Johnson Creek Watershed Council, the Sandy River Watershed Council, the East Multnomah County Soil and Water District, the City of Gresham Fire & Rescue, the Multnomah County Fire District, the NW Steelheaders, the City of Sandy, the Pleasant Home Water District, the Oregon Trail Academy, and others.

As documented in Appendix B, this extensive community engagement process resulted in numerous changes to filtration facility layout and design.