

CLEANER AIR OREGON— MODELING PROTOCOL

ROSEBURG FOREST PRODUCTS
MEDFORD, OREGON



Prepared for
OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

CLEANER AIR OREGON AIR TOXICS PROGRAM

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ACRONYMS AND ABBREVIATIONS

ASOS	National Weather Service Automated Surface Observation Systems
CAO	Cleaner Air Oregon
DEQ	Oregon Department of Environmental Quality
existing permit facility	Title V Operating Permit No. 15-0073-TV-01 MDF manufacturing facility located at 2685 North Pacific Highway in Medford, Oregon
FTP	file transfer protocol
g/s	gram(s) per second
IFW	Ice-Free Winds Group
m/s	meter(s) per second
ug/m ³	microgram(s) per cubic meter
MDF	medium-density fiberboard
MFA	Maul Foster & Alongi, Inc.
MMBtu/hr	million British thermal units per hour
NCEI	National Center for Environmental Information
NLCD92	National Land Cover Dataset for Oregon, 1992
OAR	Oregon Administrative Rule
PM	particulate matter
RBC	risk based concentration
RCO	regenerative catalytic oxidizer
RFP	Roseburg Forest Products
Medford met station	Rogue Valley International-Medford Airport monitoring station (ID 725970)
TAC	toxic air contaminant
TEU	toxic emissions unit
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

1 INTRODUCTION

Roseburg Forest Products (RFP) owns and operates a medium-density fiberboard (MDF) manufacturing facility located at 2685 North Pacific Highway in Medford, Oregon (the “facility”). The facility currently operates under Title V Operating Permit No. 15-0073-TV-01 (existing permit) issued by the Oregon Department of Environmental Quality (DEQ) on June 8, 2017.

Maul Foster & Alongi, Inc. (MFA) has been retained by RFP to assist the facility with the dispersion modeling and risk assessment component of the Cleaner Air Oregon (CAO) permitting process. On May 30, 2019, RFP submitted the toxic air contaminant (TAC) emissions inventory to the DEQ for review and approval to satisfy the initial step of the CAO permit application process as specified in Oregon Administrative Rule (OAR) 340-245-0040(3). The DEQ completed internal review and approved the submitted TAC emissions inventory by letter dated January 8, 2020.

As stated in OAR 340-245-0030(2)(b), a modeling protocol must be submitted no later than 30 days after receiving DEQ approval of the emission inventory. RFP intends to conduct a Level 3 Risk Assessment to estimate the potential excess cancer risk and chronic and acute noncancer risk (expressed numerically as the chronic and acute hazard index) impacts from the facility for comparison to the applicable risk action levels shown in OAR 340-245-8010 Table 1. The remainder of this modeling protocol outlines the proposed modeling methodology and specific information required by OAR 340-245-0210(1). This revision reflects RFP’s response to comments supplied by the DEQ.

2 FACILITY DESCRIPTION

2.1 Facility Location

The facility is located in Medford, Oregon, within the Medford urban growth boundary. An aerial image of the facility location and the property boundary is shown in Figure 2-1. The northeastern and southwestern property boundaries are adjacent to Oregon Highway 99 and the Central Oregon & Pacific Railroad line, respectively.

The area immediately surrounding the facility is characterized primarily by flat terrain with a mixture of land-use zoning including residential, mixed-use, and industrial. Existing land-use zoning information for the area surrounding the facility is discussed in Section 4.8. The topography of the area immediately surrounding the facility is presented in Figure 2-2.

2.2 Process Description

The facility produces MDF from wood furnish purchased as residuals from other wood products facilities and sawmills in the surrounding area. The wood furnish, composed mainly of chips, sawdust, and planer shavings, are transported to the facility by truck and unloaded for on-site storage.

The wood furnish is processed in a pressurized digester and refiner system to produce wood fiber, referred to as a fiber stream. Resins are blended with the fiber stream in the pneumatic transfer line (blowline blending), as it is conveyed to two direct natural gas-fired flash tube dryers for drying. The dried fibers are then formed into mats. Each mat is cut and trimmed to size and then cured in the hot press to form panels. Steam for the drying- and pressing-related processes is supplied by a boiler that can be fueled by either sanderdust and/or natural gas. Particulate matter (PM) emissions generated by fuel combustion in the boiler are controlled by a baghouse.

After leaving the hot press, the cured panels are allowed to cool in a series of board coolers. Once cooling is complete, each MDF panel is sanded and cut to finished product dimensions. Emissions generated by the two flash tube dryers and the hot press are controlled by baghouses for control of PM, followed by a regenerative catalytic oxidizer (RCO) for control of organic TAC emissions. The facility also operates several other baghouses for controlling PM emissions from material handling processes, and for collecting wood residuals to be recycled back into the manufacturing process.

A process flow diagram outlining the MDF manufacturing process and points of emissions to atmosphere is presented in Figure 2-3.

3 EMISSION ESTIMATES AND MODEL SOURCES

Daily and annual TAC emission estimates for the process equipment and emissions control devices considered to be toxics emissions units (TEUs), as defined in OAR 340-245-0020(60), were prepared by RFP as shown in the DEQ-approved TAC emissions inventory. The DEQ-approved annual and daily TAC emission estimates will be converted to units of grams per second (g/s) for purposes of conducting the Level 3 Risk Assessment as shown in Table 3-1 and 3-2, respectively. Tables 3-3 and 3-4 present the annual and daily TAC emission estimates for only TACs with established risk-based concentrations (RBCs) set forth under OAR 340-245-8040 Table 4, respectively. Additional detail regarding the how the DEQ-approved daily and annual TAC emission rates will be used to complete the Level 3 Risk Assessment will be provided in the Risk Assessment Work Plan submittal.

The TEUs identified in the DEQ-approved TAC emissions inventory will be represented in the dispersion model developed to represent the facility. Each TEU included in the dispersion model will be modeled using a unit emission rate equivalent to 1 g/s for all modeled source types as shown in Table 3-5. Additional details describing unit emission rate modeling are provided in Section 4.4.

The specific procedures for assessing the risk of each TEU is dependent on the TEU designation per OAR 340-245-0050(4). As required by OAR 340-245-0020(5), RFP will segregate emissions from the combustion of natural gas into a distinct TEU (or TEUs) and separately determine risk at each exposure location from those TEUs. The specific TEU designations will be provided in the Risk Assessment Work Plan submittal. However, for purposes of air dispersion modeling and this modeling protocol, each TEU identified in the DEQ-approved TAC emissions inventory will be included in the dispersion model of the facility.

3.1 Boiler

The facility uses a boiler that can be fired on sanderdust and/or natural gas. The boiler has a maximum heat input capacity of 77 million British thermal units per hour (MMBtu/hr) when combusting both sanderdust and natural gas fuel, and a maximum heat input capacity of 90 MMBtu/hr while combusting only natural gas fuel. The boiler is capable of producing a total of 80 thousand pounds of steam per hour.

Exhaust from the boiler is routed to a multiclone for removal of coarse particulate, and then to a baghouse for control of fine PM and metal (i.e., TACs). The exhaust stack for the boiler will be represented in the air dispersion model as an individual point source with a unique label (BOILER). The proposed release parameters for the boiler stack are presented in Table 3-5.

3.2 RCO

The RCO is used primarily to control emissions generated by operation of the flash tube dryers and the MDF press. The RCO is fueled by a total of six natural gas-fired burners with a combined maximum heat input capacity of 24 MMBtu/hr. The burners provide the heat required to bring the RCO up to operational temperature, as well as the supplemental heat required to maintain the necessary RCO oxidation temperature. The natural gas required to sustain operating temperature of the unit is typically less than the heat input capacity of the burners.

Exhaust from the RCO natural gas-fired burners, flash tube dryers, and the MDF press will be represented in the dispersion model as a single point source with a unique label (RCO). The proposed release parameters for the RCO stack are presented in Table 3-5. Supporting details and descriptions for the flash tube dryer and MDF press are provided in the following subsections.

3.2.1 Flash Tube Dryers (Dryers 2 and 3)

The facility operates two flash tube dryers, identified as Dryers 2 and 3, to remove excess moisture in the wood fibers. Dryer 2 produces dried-face material (surface layers of panels) and Dryer 3 produces dried-core material (inner layer of panels). Dryers 2 and 3 are directly heated by natural gas-fired panel burners and/or indirectly heated by steam coils (using steam generated by the boiler). Indirect steam heat is maximized to the extent possible, depending on steam availability, with natural gas heat used primarily for supplemental purposes.

Exhaust from Dryers 2 and 3 is routed to one of six process baghouses operating in parallel for fiber recovery and precleaning prior to entering the RCO for final emissions control. It is important to note that, since the facility utilizes blowline blending, exhaust gases from the pressurized digesters, refiners, and application of the resins and waxes are incorporated into the flash tube dryer exhaust stream. Exhaust gases generated by natural gas-fired combustion from the direct-fired panel burners are also a part of the flash tube dryer exhaust stream and are routed to the RCO.

3.2.2 MDF Press

The MDF press is a steam-heated, multi-opening hot press housed in a partial enclosure to capture emissions. Pre-dried and blended mats are loaded into the hot press, which uses heat and pressure to cure the resin and produce MDF panels.

Exhaust gases captured by the partial enclosure are routed to one of three baghouses operating in parallel for fine PM removal, prior to combining with the flash tube dryer exhaust. The combined exhaust stream is then routed to the RCO for final emissions control.

3.3 MDF Press Fugitives

Uncaptured emissions from the MDF press (i.e., emissions not captured by the partial enclosure and routed to the RCO) are assumed to emit to atmosphere passively as fugitive emissions. The MDF press fugitive emissions will be represented in the dispersion model as a volume source with a unique label (PRESSFUG). The proposed release parameters for the volume source are presented in Table 3-5.

Roof vents and/or building openings are not located in close proximity to the press partial enclosure. As a result, MFA proposes to model the MDF press fugitives directly above the press partial enclosure area as a single volume source. The dimensions of the MDF press partial enclosure and adjacent building height will be used to define the volume source initial lateral dimension and initial vertical dimensions, respectively.

3.4 MDF Former

The MDF former represents the vacuum forming system that produces a mat from the blended and dried fiber. Four forming heads spread the blended and dried fibers on a vacuum belt to form a continuous mat. The mat is then pre-trimmed to rough size before it enters the hot press.

Emissions generated by each forming head are controlled by one of four baghouses identified in the existing permit under the material handling emission unit. Each baghouse will be represented in the dispersion model as a horizontally oriented point source with a unique label (FORM1BH, FORM2BH, FORM4BH, and FORM5BH). The proposed release parameters for each forming head baghouse stack are shown in Table 3-5.

3.5 MDF Board Cooler

MDF panels from the hot press enter the MDF board cooler, where they are moved through indexing wheels. Cooled air is circulated between the MDF panels, allowing them to cool prior to final stacking.

Exhaust from the MDF board cooler is emitted to atmosphere through a series of roof vents (12 roof vents in total) located directly above the MDF board cooler. The exhaust vents are typically powered, but each vent can also be operated passively, depending on the desired product and ambient weather conditions. However, multiple vents are typically powered at all times the board cooler is in operation. Therefore, exhaust from the MDF board cooler will be represented in the dispersion model both as a point source and as two distinct volume sources.

The powered roof vents will be represented in the dispersion model as a representative individual point source with a unique label (BC1), while the group of passive roof vents will be divided into two distinct volume sources with unique labels (BC2 and BC3). The length of side for both volume sources will be set based on the general extents of adjacent roof vents. The proposed release parameters for each MDF board cooler release points are shown in Table 3-5. MFA assumes that the active ventilation provided by the powered vents will exhaust almost all the emissions generated by the MDF board cooler. To reflect this, 90% of the total emissions generated by the MDF board cooler will conservatively be assigned to the point source representation, and the remaining balance will be assigned evenly between the two volume sources.

3.6 MDF Sander

The MDF sander smooths the surface of the MDF panels to final product specifications as part of the finishing operation. PM emissions generated by the MDF sander are controlled by a baghouse.

Emissions from the MDF sander baghouse will be represented in the air dispersion model as an individual point source with a unique label (SANDBH). The proposed release parameters for the MDF sander baghouse stack are shown in Table 3-5.

3.7 MDF Finishing Saw and Board Trim Hog

The MDF finishing saw and board trim hog are also utilized in the finishing operation to cut MDF panels to the appropriate final product dimensions. Trimmed material from the MDF finishing saw passes through the board trim hog for particle size reduction, generating wood furnish. The hogged wood furnish is then recycled back into the MDF manufacturing process.

Emissions generated by operating the MDF finishing saw and board trim hog are controlled by a baghouse identified in the existing permit under the material handling emission unit. The MDF finishing saw and board trim hog baghouse stack will be represented in the air dispersion model as an individual point source with a unique label (SAWBH). The proposed release parameters for the MDF finishing saw and board trim hog baghouse stack are presented in Table 3-5.

3.8 Coatings

Coating products, which include spray paints and marking inks with varied TAC compositions, are used for marking MDF panels. The coating products are primarily used within the finished goods warehouse. Fugitive emissions produced from using each coating product (i.e., spraying and/or ink drying) are assumed to be uncontrolled and emitted through nearby vents spaced incrementally along the finished goods warehouse roof.

Fugitive emissions from coatings use will be represented in the air dispersion model as a volume source with unique label (COATINGS). The proposed release parameters for the volume source are shown in Table 3-5.

4 AIR DISPERSION MODELING METHODOLOGY

The following subsections detail the proposed conceptual site model for the facility. The proposed conceptual site model will be used in support of the Level 3 Risk Assessment.

4.1 Model Selection

MFA proposes to setup the dispersion model of the facility using the models shown in Table 4-1. Lakes Environmental, a third-party overlay software, will be used to execute the dispersion model.

Table 4-1. Proposed Model Selection

Model	Model Version
AERMOD	19191
AERMET	19191
AERMAP	18081
AERSURFACE	13016
AERMINUTE	15272
BPIP	04274

4.2 Meteorological and Terrain Datasets

In preparation for air dispersion modeling, MFA obtained the meteorological and terrain data files shown in Table 4-2 below.

Table 4-2. Proposed Meteorological and Terrain Data

Dataset	Station ID
Surface	Station ID 725970 (Rogue Valley International-Medford Airport)
Upper Air	Station ID 24225 for Medford, OR (National Oceanic and Atmospheric Administration/ Earth System Research Laboratory Radiosonde Database)
Terrain	USGS National Elevation Dataset (1/3-arc seconds with horizontal resolution of 10 meter)

4.2.1 Surface Meteorological Data

Surface meteorological data were collected from the Rogue Valley International-Medford Airport monitoring station (ID 725970) located in Medford, Oregon (Medford met station). Hourly wind speed, wind direction, cloud cover, and temperature data for the years 2014 through 2018 were downloaded by file transfer protocol (FTP) from the National Center for Environmental Information (NCEI). The Medford met station was chosen as the most representative, publicly available surface meteorological data for the facility for the following reasons:

- The Medford met station represents the closest meteorological station to the facility location with data available for download from the NCEI. The Medford met station is approximately 4.1 kilometers to the northeast of the facility, and is located in an area characterized as flat with minimal terrain features.
- Both the Medford met station and the facility are centrally located within Rogue valley.

The Medford met station is part of the National Weather Service Automated Surface Observation Systems (ASOS) network. The Medford met station collects wind speed and wind direction, both of which are sampled once per second, with the average computed every five seconds. These data are referred to as “ASOS 1-minute.”

The Medford met station is part of the Ice-Free Winds Group (IFW) within the ASOS network. IFW stations collect wind data, using a sonic anemometer, which has no minimum detection threshold to determine “calms.” The ASOS 1-minute data (TD-6405) for the years 2014 through 2018 were extracted by FTP from the NCEI. These data were processed using the USEPA AERMINUTE program.

4.2.2 Upper Air Data

Upper air meteorological data were collected in the Forecast Systems Laboratory format for Medford, OR (station ID 24225), from the National Oceanic and Atmospheric Administration/Earth System Research Laboratory Radiosonde Database. Upper air meteorological data were extracted for the years 2014 through 2018.

4.2.3 Data Processing—AERMET

The surface and upper air meteorological data were processed using the USEPA AERMET program to produce five years of model-ready meteorological data for use in the AERMOD dispersion model. The adjustment to the surface frictional velocity (ADJ_U*) option was selected as part of the AERMET processing. The land use surface characteristics were processed using AERSURFACE, and AERMINUTE was used to process and incorporate the ASOS 1-minute wind data into AERMET.

When ASOS 1-minute data are used, AERMET enables a default wind speed adjustment option. This option adds 0.26 meters per second (m/s) to all wind speeds to account for wind speed truncation (in units of whole knots) applied by the ASOS quality assurance system. Per the USEPA technical memorandum titled “Use of ASOS meteorological data in AERMOD dispersion modeling”¹ dated March 8, 2013, a minimum wind speed detection threshold of 0.5 m/s was used to account for the adjustment. Wind direction randomization was not selected when running AERMET because ASOS 1-minute data increase the precision of wind direction measurements and, unlike non-ASOS data, are rounded to the nearest ten whole degrees.

After executing AERMET for each calendar year, the surface and profile files were combined to create a complete 5-year meteorological dataset for use in the dispersion model. An analysis of the data completeness for the proposed meteorological dataset was performed by MFA using the QA feature available in the Lakes Environmental software. As shown in Table 4-3, the surface and profile files produced by AERMET are more than 90% complete for each calendar quarter in the meteorological dataset.

A wind rose for the meteorological dataset described above is presented in Figure 4-1. The wind direction for this meteorological dataset is predominantly north to northwest, with a southerly component. Note this wind direction orientation is consistent with the orientation of the Rogue Valley.

4.3 Land Use

In preparation for air dispersion modeling, AERSURFACE was used to generate seasonal values for albedo, Bowen ratio, and surface roughness heights. The National Land Cover Dataset, 1992 (NLCD92) land cover class definitions for the State of Oregon were downloaded from the U.S. Geological Survey (USGS). These data were processed using the USEPA AERSURFACE land use tool to generate the surface characteristics necessary to run AERMET. MFA proposes to process AERSURFACE using the settings described in Table 4-4.

Surface moisture conditions were determined following the methodology set forth in the US EPA AERSURFACE User’s Guide dated January 16, 2013 (AERSURFACE User’s Guide). Section 2.2 of the AERSURFACE User’s Guide states *“the surface moisture condition can be determined by comparing precipitation for the period of data to be processed to the 30-year climatological record, selecting “wet” conditions if*

¹ https://www3.epa.gov/ttn/scram/guidance/clarification/20130308_Met_Data_Clarification.pdf

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precipitation is in the upper 30th-percentile, “dry” conditions if precipitation is in the lower 30th-percentile, and “average” conditions if precipitation is in the middle 40th-percentile.”

Annual precipitation data for each year of the 5-year meteorological dataset were reviewed and compared against the 30-year climatological record to determine the representative surface moisture condition for each modeling year. As shown in Table 4-5, the average annual precipitation varied between the lower 30th percentile to greater than the 70th percentile of the 30-year climatological record. To account for this variability, AERSURFACE was executed for each year using the corresponding surface moisture condition associated with that year’s annual rainfall.

MFA proposes to execute the dispersion model using rural dispersion coefficients. To make this determination, MFA followed the land use procedure, as recommended by USEPA “Guideline on Air Quality Models”², to conclude that less than 50 percent of the land use within the modeling domain is represented by the urban land use type.

4.4 Unit Emission Rate

Results from the air dispersion model runs, executed using unit emission rates for each TEU identified in the DEQ-approved TAC emissions inventory, can be used to derive the predicted concentrations for multiple TACs from a given TEU. MFA proposes to execute the dispersion model using unit emission rates for all TEUs, for both the annual and daily (i.e., 24-hour) averaging periods, as shown in Table 3-5.

The maximum modeled unit concentration in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for each averaging period will be considered a modeled “dispersion factor” with units of $\mu\text{g}/\text{m}^3$ per g/s. When multiplied by the TAC emission rate for the modeled TEU, the result is the modeled concentration of the TAC. The dispersion factors will be used to conduct the Level 3 Risk Assessment, in combination with TAC emission rates for each TEU in g/s and the RBCs in $\mu\text{g}/\text{m}^3$ set forth under OAR 340-245-8040 Table 4.

4.5 Emissions Source Locations

The location of each TEU to be included in the dispersion model is shown in Figure 4-2.

4.6 Building Downwash

The most recent version of the USEPA Building Profile Input Program, incorporating the Plume Rise Model Enhancements Algorithms (e.g., BPIP-PRM), will be used to calculate direction-specific building downwash parameters for all significant building structures located at the facility. The current version of BPIP-PRM will be used as shown in Table 4-1.

² Appendix W to Part 51 – “Guideline on Air Quality Models”. See Section 7.2.1.1(b).

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The proposed locations for structures that are projected to influence downwash are included in Figure 4-2. All stacks at the facility meet Good Engineering Practice design parameters. Table 4-6 presents a summary of the proposed building heights to be included in the air dispersion model.

4.7 Receptor Locations and Terrain

Dispersion factors will be determined for each modeling receptor identified outside the facility property boundary. MFA proposes to place modeling receptors at potential exposure locations in the surrounding area up to 10 kilometers away from the center of the facility. Figure 4-3 presents the proposed receptor spacing and locations for the modeling domain. Figure 4-4 presents the proposed receptor locations in the immediate area surrounding the facility.

Receptors will be defined in the dispersion model as shown in Table 4-7. If high impact areas are identified outside of the 50-meter grid upon review of modeled unit concentrations, MFA will place additional receptors in 25-meter space increments within applicable areas.

Table 4-7. Proposed Receptor Location Spacing

Receptor Spacing	Receptor Distance
25 m	Along fence line and out to 600 m from fence line
50 m	600 to 1,000 m
100 m	1,000 to 2,000 m
200 m	2,000 to 3,000 m
500 m	3,000 to 10,000 m

MFA identified multiple locations considered to be “sensitive exposure locations” (e.g., schools) within approximately 1-kilometer from the facility property boundary. Identified sensitive exposure locations are presented in Table 4-8. Each sensitive exposure location shown in Table 4-8 will be accounted for in the dispersion model by a proposed receptor location.

Table 4-8. Identification of Sensitive Exposure Locations

UTM Coordinates (m)		Sensitive Exposure Location
Easting	Northing	
508,909.66	4,689,462	Howard Elementary School
509,309.66	4,689,212	Early Head Start Merriman Campus (Preschool)
510,809.66	4,688,062	Wilson Elementary School
510,809.66	4,687,962	Medford Montessori School (Kindergarten)
510,309.66	4,686,962	Kids Unlimited (Youth Organization)
510,109.66	4,687,862	Wee Watch 'em Daycare (Rogue Valley Mall)

Terrain elevations for model receptors, source base elevations, and base elevations of downwash structures will be taken from USGS National Elevation Dataset data at a resolution of 1/3 arc-seconds

(a horizontal resolution of roughly 10 meters) and processed using the current version of AERMAP as shown in Table 4-1.

4.8 Land-Use Zoning Classification Data for Determining Exposure Types

In anticipation of dispersion modeling, the Department of Land Conservation and Development's statewide zoning data were reviewed to determine land-use classifications for areas within the modeling domain. The statewide zoning classifications provide the basis for the initial categorization of exposure classifications (e.g. residential, non-residential worker, non-residential child, or acute), as shown in Table 4-9. The zoning data was further evaluated against local data sets such as City of Medford zoning, Jackson County zoning and school-location information. MFA also reviewed aerial imagery via Esri ArcGIS and Google Earth software, and a physical site inspection of select areas was performed by RFP personnel to determine whether the existing zoning information reflects actual land-use and the corresponding exposure type categorization.

The zoning data and internal review process indicate multiple proposed receptor locations fall within roadway and/or rail rights-of-way interstitial spaces as shown (in black) in Figures 4-3 and 4-4. These locations are proposed for dispersion modeling in order to maintain a uniform receptor grid per DEQ request. MFA is not proposing to conduct risk evaluations for any receptors in roadway or rail rights-of-way as these are not exposure locations. In the crosswalk-of-receptors, provided to the DEQ in spreadsheet format, these locations are labeled as "Risk Not Assessed," although they will be modeled, and dispersion factors will be generated. MFA has checked receptor locations near the property where it is expected that the maximally exposed receptors will be located. If there are receptors farther from the facility that are located in roadways or rail rights-of-way that have been unknowingly identified as an exposure location due to the automated zoning evaluation process, and these locations have an impact on the risk assessment evaluation, these will be addressed in the Risk Assessment Report and excluded from evaluation.

Figure 4-5 presents the existing land-use zoning identified for the modeling domain, and Figure 4-6 is provided for the area immediately surrounding the facility. Figures 4-7 and 4-8 present the corresponding exposure location categorization for the modeling domain and the immediate area surrounding the facility, respectively. For additional clarification, Table 4-10 shows all proposed receptor locations where the determined land-use and exposure location classifications differ from the statewide zoning information.

5 CLOSING

MFA looks forward to working with the DEQ throughout the CAO permit application process. If there are any questions or comments regarding this modeling protocol, please contact Brian Snuffer at (971) 254-8077.

LIMITATIONS

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TABLES



Table 3–1
DEQ-Approved Annual Emission Rates—All TACs
Roseburg Forest Products—Medford, Oregon

Toxic Air Contaminant	CAS	RBC? (Yes/No)	Annual Emission Estimates (Units)																										Total Facility Annual Emissions Estimate										
			Boiler 4		Dryers 2 & 3 / Press Captured / RCO								MDF Former								Press Fugitives	MDF Board Cooler						MDF Sander Baghouse			Inline Saw Baghouse		Material Balance						
			Fuel Combustion		Natural Gas Combustion				Wood Drying		Press		Total	Baghouse				Total	Passive Ventilation			Forced Ventilation	No. 12		No. 13														
			Wood	Natural Gas	Dryer	RCO					No. 8	No. 9		No. 10	No. 11	(lb/yr) ⁽¹⁾	(g/s) ^(a)		(lb/yr) ^(b)	(g/s) ^(a)			(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)				(g/s) ^(a)	(lb/yr) ^(b)			(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)
Model ID	--	--	BLR_WD	BLR_NG	DRY_NG	RCO_NG		RCO		--	FORM1BH	FORM2BH	FORM4BH	FORM5BH	PRESSFUG	--	BC2	BC3	BC1	SANDBH	SAWBH	COATINGS	--	--															
Emissions Fraction Estimate ⁽²⁾	--	--	--	--	--	--	--	--	--	--	0.25	0.25	0.25	0.25	--	--	0.050	0.050	0.90	--	--	--	--	--															
1,1,1-Trichloroethane (methyl chloroform)	71-55-6	Yes	32.2	4.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32.2	4.6E-04														
1,2-Dichloropropane (propylene dichloride)	78-87-5	Yes	9.35	1.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.35	1.3E-04														
Acetaldehyde	75-07-0	Yes	157	2.3E-03	1.68	2.4E-05	--	--	0.64	9.1E-06	1,640	0.024	289	4.2E-03	--	--	24.8	3.6E-04	118	5.92	8.5E-05	5.92	8.5E-05	107	1.5E-03	--	--	--	--	--	2,231	0.032							
Acetophenone	98-86-2	No	1.02	1.5E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.02	1.5E-05													
Acrolein	107-02-8	Yes	145	2.1E-03	1.46	2.1E-05	--	--	0.55	8.0E-06	--	--	--	--	--	--	--	--	36.5	1.82	2.6E-05	1.82	2.6E-05	32.8	4.7E-04	--	--	--	--	--	183	2.6E-03							
Benzene	71-43-2	Yes	545	7.8E-03	3.15	4.5E-05	--	--	1.19	1.7E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	550	7.9E-03													
Bromomethane (methyl bromide)	74-83-9	Yes	6.29	9.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.29	9.0E-05													
n-Butyl alcohol (1-Butanol)	71-36-3	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.99	7.2E-05	4.99	7.2E-05												
Carbon tetrachloride	56-23-5	Yes	5.49	7.9E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.49	7.9E-05														
Chlorine	7782-50-5	Yes	440	6.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	6.3E-03														
Chlorobenzene	108-90-7	Yes	9.24	1.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.24	1.3E-04														
Chloroform	67-66-3	Yes	11.2	1.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.2	1.6E-04														
Chloromethane (methyl chloride)	74-87-3	Yes	24.2	3.5E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24.2	3.5E-04														
Crotonaldehyde	4170-30-3	No	24.9	3.6E-04	--	--	--	--	--	--	183	2.6E-03	27.1	3.9E-04	--	--	2.33	3.3E-05	42.1	2.10	3.0E-05	2.10	3.0E-05	37.9	5.4E-04	--	--	--	--	--	279	4.0E-03							
Cumene	98-82-8	Yes	9.85	1.4E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.85	1.4E-04													
Diethylphthalate	84-66-2	No	24.3	3.5E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24.3	3.5E-04														
Dibutyl phthalate	84-74-2	No	18.5	2.7E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18.5	2.7E-04													
Ethylbenzene	100-41-4	Yes	6.79	9.8E-05	3.74	5.4E-05	1.24	1.8E-05	1.41	2.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.2	1.9E-04													
Ethylene glycol monobutyl ether	111-76-2	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	142	2.0E-03	142	2.0E-03											
Formaldehyde	50-00-0	Yes	584	8.4E-03	6.67	9.6E-05	--	--	2.52	3.6E-05	11,986	0.17	--	--	--	--	243	3.5E-03	5,746	287	4.1E-03	287	4.1E-03	5,171	0.074	1,143	0.016	--	--	--	19,712	0.28							
Hexane	110-54-3	Yes	160	2.3E-03	2.49	3.6E-05	0.82	1.2E-05	0.94	1.4E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	165	2.4E-03													
Hydrochloric acid	7647-01-0	Yes	70.1	1.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	70.1	1.0E-03													
Hydrogen fluoride	7664-39-3	Yes	50.4	7.2E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50.4	7.2E-04													
Isopropyl alcohol (isopropanol)	67-63-0	Yes	2,515	0.036	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	126	1.8E-03	2,641	0.038											
Methanol	67-56-1	Yes	407	5.9E-03	--	--	--	--	--	--	9,713	0.14	--	6,751	1,688	0.024	1,688	0.024	1,688	0.024	1,688	0.024	411	5.9E-03	6,502	325	4.7E-03	325	4.7E-03	5,852	0.084	2,183	0.031	1,854	0.027	--	--	27,822	0.40
Methyl ethyl ketone	78-93-3	Yes	3.88	5.6E-05	--	--	--	--	--	--	30.6	4.4E-04	--	--	--	--	2.62	3.8E-05	18.1	0.90	1.3E-05	0.90	1.3E-05	16.3	2.3E-04	--	--	--	--	--	--	55.2	7.9E-04						
Methyl isobutyl ketone	108-10-1	Yes	--	--	--	--	--	--	--	--	476	6.8E-03	923	0.013	--	--	79.1	1.1E-03	--	--	--	--	--	--	1,478	0.021													
Methylene diphenyl diisocyanate (MDI)	101-68-8	Yes	--	--	--	--	--	--	--	--	482	6.9E-03	212	3.0E-03	--	--	--	--	--	--	--	--	--	--	--	712	0.010												
Dichloromethane (methylene chloride)	75-09-2	Yes	221	3.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	221	3.2E-03													
Phenol	108-95-2	Yes	89.0	1.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	89.0	1.3E-03													
Propionaldehyde	123-38-6	Yes	173	2.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	173	2.5E-03													
Propylene	115-07-1	Yes	--	--	287	4.1E-03	95.0	1.4E-03	109	1.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	491	7.1E-03													
Propylene glycol monomethyl ether	107-98-2	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.3	2.5E-04	17.3	2.5E-04										
Styrene	100-42-5	Yes	261	3.8E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	261	3.8E-03												
Toluene	108-88-3	Yes	6.34	9.1E-05	14.4	2.1E-04	--	--	5.43	7.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26.1	3.8E-04												
Xylenes	1330-20-7	Yes	2.90	4.2E-05	10.7	1.5E-04	--	--	4.04	5.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.6	2.5E-04												
Antimony and compounds	7440-36-0	Yes	0.17	2.4E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.17	2.4E-06												
Arsenic and compounds	7440-38-2	Yes	1.05	1.5E-05	2.4E-03	3.4E-08	2.3E-03	3.2E-08	0.045	6.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.10	1.6E-05											
Barium and compounds	7440-39-3	No	116	1.7E-03	0.048	6.9E-07	0.045	6.5E-07	0.90	1.3E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	117	1.7E-03											
Beryllium and compounds	7440-41-7	Yes	0.016	2.3E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.016	2.3E-07												
Cadmium and compounds	7440-43-9	Yes	0.18	2.6E-06	0.012	1.7E-07	0.011	1.6E-07	0.23	3.2E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.43	6.2E-06												
Chromium and compounds	7440-47-3	No	--	--	0.015	2.1E-07	0.014	2.0E-07	0.28	4.0E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.30	4.4E-06												
Chromium VI	18540-29-9	Yes	0.15	2.2E-06	6.1E-04	8.7E-09	5.7E-04	8.3E-09	0.011	1.7E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.16	2.4E-06												
Cobalt and compounds	7440-48-4	Yes	0.28	4.0E-06	9.1E-04	1.3E-08	8.6E-04	1.2E-08	0.017	2.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.30	4.3E-06												
Copper and compounds	7440-50-8	Yes	2.11	3.0E-05	9.2E-03	1.3E-07	8.7E-03	1.3E-07	0.17	2.5E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.30	3.3E-05												
Lead and compounds	7439-92-1	Yes	2.90	4.2E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.90	4.2E-05												
Manganese and compounds																																							

Table 3–1
DEQ-Approved Annual Emission Rates—All TACs
Roseburg Forest Products—Medford, Oregon

Toxic Air Contaminant	CAS	RBC? (Yes/No)	Annual Emission Estimates (Units)																										Total Facility Annual Emissions Estimate									
			Boiler 4		Dryers 2 & 3 / Press Captured / RCO								MDF Former								Press Fugitives	Total	MDF Board Cooler															
			Fuel Combustion		Natural Gas Combustion				Wood Drying		Press		Total	Baghouse				No. 8	No. 9	No. 10	No. 11			Passive Ventilation		Forced Ventilation		MDF Sander Baghouse		Inline Saw Baghouse		Material Balance						
			Wood		Natural Gas				Dryer		RCO														Roof Vent Group 1		Roof Vent Group 2		No. 12		No. 13							
			(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ^(b)	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr) ⁽¹⁾	(g/s) ^(a)	(lb/yr)	(g/s)	
Model ID	--	--	BLR_WD		BLR_NG		DRY_NG		RCO_NG		RCO		--	FORM1BH		FORM2BH		FORM4BH		FORM5BH		PRESSFUG	--	BC2		BC3		BC1		SANDBH		SAWBH		COATINGS		--	--	
Emissions Fraction Estimate ⁽²⁾	--	--	--		--		--		--		--		--	0.25		0.25		0.25		0.25		--	--	0.050		0.050		0.90		--		--		--		--	--	
Acenaphthene	83-32-9	No	0.47	6.8E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.47	6.8E-06		
Acenaphthylene	208-96-8	No	2.61	3.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.61	3.8E-05		
Anthracene	120-12-7	No	1.49	2.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.49	2.1E-05		
Benzo(a)anthracene	56-55-3	Yes	0.045	6.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.045	6.5E-07		
Benzo(a)pyrene	50-32-8	Yes	1.52	2.2E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.52	2.2E-05		
Benzo(b)fluoranthene	205-99-2	Yes	0.079	1.1E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.079	1.1E-06		
Benzo(e)pyrene	192-97-2	No	0.12	1.7E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	1.7E-06		
Benzo(g,h,i)perylene	191-24-2	Yes	0.084	1.2E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.084	1.2E-06		
Benzo(j)fluoranthene	205-82-3	Yes	0.087	1.2E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.087	1.2E-06		
Benzo(k)fluoranthene	207-08-9	Yes	0.029	4.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.029	4.1E-07		
Chrysene	218-01-9	Yes	0.044	6.3E-07	9.8E-04	1.4E-08	--	--	3.7E-04	5.3E-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.045	6.5E-07		
Dibenzo(a,h)anthracene	53-70-3	Yes	5.3E-03	7.7E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.3E-03	7.7E-08		
Fluoranthene	206-44-0	Yes	0.93	1.3E-05	1.6E-03	2.3E-08	--	--	6.1E-04	8.8E-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.93	1.3E-05		
Fluorene	86-73-7	No	1.68	2.4E-05	1.5E-03	2.2E-08	--	--	5.7E-04	8.3E-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.68	2.4E-05		
Indeno(1,2,3,c,d)pyrene	193-39-5	Yes	0.057	8.2E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.057	8.2E-07		
2-Methyl naphthalene	91-57-6	No	0.78	1.1E-05	0.013	1.9E-07	--	--	4.9E-03	7.1E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.80	1.1E-05		
Naphthalene	91-20-3	Yes	55.4	8.0E-04	0.16	2.3E-06	--	--	0.061	8.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	55.6	8.0E-04		
Perylene	198-55-0	No	0.018	2.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.018	2.6E-07		
Phenanthrene	85-01-8	No	3.59	5.2E-05	9.2E-03	1.3E-07	--	--	3.5E-03	5.0E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.61	5.2E-05		
Pyrene	129-00-0	No	1.97	2.8E-05	2.7E-03	3.9E-08	--	--	1.0E-03	1.5E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.97	2.8E-05		
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	6.5E-07	9.4E-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.5E-07	9.4E-12		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	Yes	1.0E-06	1.5E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-06	1.5E-11		
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	Yes	7.3E-07	1.0E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.3E-07	1.0E-11		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	Yes	7.3E-07	1.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.3E-07	1.1E-11		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	Yes	8.3E-07	1.2E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.3E-07	1.2E-11		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	Yes	3.2E-06	4.5E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-06	4.5E-11		
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	Yes	1.2E-05	1.7E-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.2E-05	1.7E-10		
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	Yes	2.2E-06	3.2E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-06	3.2E-11		
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	Yes	1.0E-06	1.5E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-06	1.5E-11		
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	Yes	1.5E-06	2.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-06	2.1E-11		
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	Yes	7.1E-07	1.0E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.1E-07	1.0E-11		
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	Yes	5.0E-07	7.2E-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.0E-07	7.2E-12		
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	Yes	7.4E-07	1.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.4E-07	1.1E-11		
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	Yes	6.6E-07	9.4E-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.6E-07	9.4E-12		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	Yes	1.9E-06	2.7E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-06	2.7E-11		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	Yes	5.9E-07	8.4E-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.9E-07	8.4E-12		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	Yes	3.2E-06	4.6E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-06	4.6E-11		
Total TAC Emissions Estimate			6.473	0.093	332	4.8E-03	97.5	1.4E-03	134	1.9E-03	24,480	0.35	1,481	0.021	6,751	1,688	0.024	1,688	0.024	1,688	0.024	1,688	0.011	12,463	623	9.0E-03	623	9.0E-03	11,217	0.16	3,326	0.048	1,854	0.027	290	4.2E-03	58,464	0.84

Notes:

(a) Emission rate (g/s) = [annual

Table 3-2
DEQ-Approved Daily Emission Rates—All TACs
Roseburg Forest Products—Medford, Oregon

Toxic Air Contaminant	CAS	RBC? (Yes/No)	Daily Emission Estimates (Units)																				Total Facility Daily Emissions Estimate									
			Boiler 4		Dryers 2 & 3 / Press Captured / RCO							Total	MDF Former ^(B)								Press Fugitives	Total			MDF Board Cooler ^(C)				MDF Sander Baghouse	Inline Saw Baghouse		Material Balance
			Fuel Combustion		Natural Gas Combustion					Wood Drying		Press		No. 8	Baghouse		No. 9	No. 10	No. 11	Pasive Ventilation					Forced Ventilation		No. 12	No. 13				
			Wood	Natural Gas	Dryer	RCO	Wood Drying	Press		No. 8	No. 9	No. 10	No. 11	Rooftop Group 1	Rooftop Group 2	Roof Ventilator	No. 12	No. 13														
			(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)	(lb/day) ⁽¹⁾	(g/s) ^(A)			(lb/day) ⁽¹⁾	(g/s) ^(A)						
			Model ID	--	--	BLR_WD	BLR_NG	DRY_NG	RCO_NG	RCO	RCO	--	FORM1BH	FORM2BH	FORM4BH	FORMSBH	PRESSFUG	--	B/C2	B/C3	B/C1	SANDBH			SAWBH	COATINGS	--	--				
Emissions Fraction Estimate ⁽²⁾	--	--	--	--	--	--	--	--	--	0.25	0.25	0.25	0.25	--	--	0.050	0.050	0.90	--	--	--	--	--									
1,1,1-Trichloroethane (methyl chloroform)	71-55-6	Yes	0.11	5.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	5.6E-04								
1,2-Dichloropropane (propylene dichloride)	78-87-5	Yes	0.031	1.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.031	1.6E-04								
Acetaldehyde	75-07-0	Yes	0.52	2.7E-03	5.6E-03	2.9E-05	--	1.7E-03	9.1E-06	6.21	0.033	1.09	5.7E-03	--	0.094	4.9E-04	0.45	0.022	1.2E-04	0.022	1.2E-04	0.40	2.1E-03	--	8.38	0.044						
Acetophenone	98-86-2	No	3.4E-03	1.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-03	1.8E-05							
Acrolein	107-02-8	Yes	0.48	2.5E-03	4.9E-03	2.6E-05	--	--	1.5E-03	8.0E-06	--	--	--	--	--	--	0.14	6.9E-03	3.6E-05	6.9E-03	3.6E-05	0.12	6.5E-04	--	--	0.63	3.3E-03					
Benzene	71-43-2	Yes	1.81	9.5E-03	0.010	5.5E-05	--	--	3.3E-03	1.7E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.82	9.6E-03					
Bromomethane (methyl bromide)	74-83-9	Yes	0.021	1.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.021	1.1E-04							
n-Butyl alcohol (1-butanol)	71-36-3	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.016	8.2E-05	0.016	8.2E-05					
Carbon tetrachloride	56-23-5	Yes	0.018	9.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.018	9.6E-05						
Chlorine	7782-50-5	Yes	1.46	7.7E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.46	7.7E-03						
Chlorobenzene	108-90-7	Yes	0.031	1.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.031	1.6E-04					
Chloroform	67-66-3	Yes	0.037	2.0E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.037	2.0E-04						
Chloromethane (methyl chloride)	74-87-3	Yes	0.080	4.2E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.080	4.2E-04					
Crotonaldehyde	4170-30-3	No	0.083	4.3E-04	--	--	--	0.69	3.6E-03	0.10	5.4E-04	--	--	--	--	--	8.8E-03	4.6E-05	0.16	8.0E-03	4.2E-05	8.0E-03	4.2E-05	0.14	7.5E-04	--	1.05	5.5E-03				
Cumene	98-82-8	Yes	0.033	1.7E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.033	1.7E-04					
Diethylphthalate	84-66-2	No	0.081																													

Table 3-2
DEQ-Approved Daily Emission Rates—All TACs
Roseburg Forest Products—Medford, Oregon

Toxic Air Contaminant	CAS	RBC? (Yes/No)	Daily Emission Estimates (Units)																																					
			Boiler 4				Dryers 2 & 3 / Press Captured / RCO								MDF Former ^(b)										Press Fugitives	MDF Board Cooler ^(b)							MDF Sander Baghouse	Inline Saw Baghouse	Material Balance		Total Facility Daily Emissions Estimate			
			Fuel Combustion				Natural Gas Combustion				Wood Drying				Press		Total	Baghouse				Total	Passive Ventilation				Forced Ventilation													
			Wood		Natural Gas		Dryer		RCO		Wood Drying		Press		Total	No. 8		No. 9		No. 10		No. 11		Total		Roof Vent Group 1		Roof Vent Group 2		Forced Ventilation										
			(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)		(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)									
			BLR	WD	BLR	NG	DRY	NG	RCO	NG	RCO					FORM1BH	FORM2BH	FORM4BH	FORM5BH	PRESSFUG	--	BC2	BC3	BC1	SANDBH	SAWBH	COATINGS	--	--											
Emissions Fraction Estimate ⁽²⁾	--	--	--	--	--	--	--	--	--	--	--	--	0.25	0.25	0.25	0.25	--	--	0.050	0.050	0.90	--	--	--	--	--	--	--	--											
Acenaphthene	83-32-9	No	1.6E-03	8.3E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-03	8.3E-06											
Acenaphthylene	208-96-8	No	8.7E-03	4.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.7E-03	4.6E-05											
Anthracene	120-12-7	No	5.0E-03	2.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.0E-03	2.6E-05											
Benzo[a]anthracene	56-55-3	Yes	1.5E-04	7.9E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-04	7.9E-07											
Benzo[a]pyrene	50-32-8	Yes	5.0E-03	2.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.0E-03	2.6E-05											
Benzo[b]fluoranthene	205-99-2	Yes	2.6E-04	1.4E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.6E-04	1.4E-06											
Benzo[e]pyrene	192-97-2	No	3.9E-04	2.0E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-04	2.0E-06											
Benzo[g,h,i]perylene	191-24-2	Yes	2.8E-04	1.5E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-04	1.5E-06											
Benzo[j]fluoranthene	205-82-3	Yes	2.9E-04	1.5E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.9E-04	1.5E-06											
Benzo[k]fluoranthene	207-08-9	Yes	9.6E-05	5.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.6E-05	5.0E-07											
Chrysene	218-01-9	Yes	1.5E-04	7.7E-07	3.2E-06	1.7E-08	--	--	1.0E-06	5.3E-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-04	7.9E-07											
Dibenzo[a,h]anthracene	53-70-3	Yes	1.8E-05	9.3E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.8E-05	9.3E-08											
Fluoranthene	206-44-0	Yes	3.1E-03	1.6E-05	5.4E-06	2.8E-08	--	--	1.7E-06	8.8E-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.1E-03	1.6E-05											
Fluorene	86-73-7	No	5.6E-03	2.9E-05	5.0E-06	2.6E-08	--	--	1.6E-06	8.3E-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.6E-03	2.9E-05											
Indeno[1,2,3-c,d]pyrene	193-39-5	Yes	1.9E-04	9.9E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-04	9.9E-07											
2-Methyl naphthalene	91-57-6	No	2.6E-03	1.4E-05	4.3E-05	2.3E-07	--	--	1.3E-05	7.1E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.6E-03	1.4E-05											
Naphthalene	91-20-3	Yes	0.18	9.7E-04	5.4E-04	2.8E-06	--	--	1.7E-04	8.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.18	9.7E-04											
Perylene	198-55-0	No	5.9E-05	3.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.9E-05	3.1E-07											
Phenanthrene	85-01-8	No	0.012	6.3E-05	3.1E-05	1.6E-07	--	--	9.5E-06	5.0E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.012	6.3E-05											
Pyrene	129-00-0	No	6.5E-03	3.4E-05	9.0E-06	4.7E-08	--	--	2.8E-06	1.5E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.6E-03	3.4E-05											
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	2.2E-09	1.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-09	1.1E-11											
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	Yes	3.4E-09	1.8E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-09	1.8E-11											
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	Yes	2.4E-09	1.3E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-09	1.3E-11											
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	Yes	2.4E-09	1.3E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-09	1.3E-11											
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	Yes	2.7E-09	1.4E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-09	1.4E-11											
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	Yes	1.0E-08	5.5E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-08	5.5E-11											
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	Yes	3.9E-08	2.1E-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-08	2.1E-10											
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	Yes	7.4E-09	3.9E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.4E-09	3.9E-11											
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	Yes	3.4E-09	1.8E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-09	1.8E-11											
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	Yes	4.9E-09	2.6E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.9E-09	2.6E-11											
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	Yes	2.4E-09	1.2E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-09	1.2E-11											
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	Yes	1.7E-09	8.7E-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.7E-09	8.7E-12											
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	Yes	2.5E-09	1.3E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-09	1.3E-11											
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	Yes	2.2E-09	1.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-09	1.1E-11											
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	Yes	6.3E-09	3.3E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.3E-09	3.3E-11											
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	Yes	1.9E-09	1.0E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-09	1.0E-11											
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	Yes	1.1E-08	5.6E-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-08	5.6E-11											
Total Emissions Estimate			21.5	0.11	1.10	5.8E-03	0.27	1.4E-03	0.37	1.9E-03	92.7	0.49	5.61	0.029	25.6	6.39	0.034	6.39	0.034	6.39	0.034	6.39	0.034	2.96	0.016	47.2	2.36	0.012	2.36	0.012	42.5	0.22	12.6	0.066	7.02	0.037	0.92	4.8E-03	218	1.14

Notes:

(a) Emission rate (g/s) = (daily emissions estimate [lb/day]) $\times$ (453.592 g/lb) $\times$ (day/24 hrs) $\times$ (hr/3,600 s)

(b) Emission rate (lb/day) = (total emissions estimate [lb/day]) x (emissions fraction estimate)

References:

(1) Emissions estimate obtained from DEQ-approved emissions inventory per letter dated January 8, 2020.

(2) Emissions fraction equally apportioned between ventilation points, and is estimated based on general orientation of the ventilation point in relation to the emission source.

Table 3-3
DEQ-Approved Annual Emission Rates—RBC Only
Roseburg Forest Products—Medford, Oregon

Toxic Air Contaminant	CAS	RBC? (Yes/No)	Annual Emission Estimates (Units)																							Total Facility Annual Emissions Estimate																			
			Boiler 4					Dryers 2 & 3 / Press Captured / RCO					MDF Former								Press Fugitives		MDF Board Cooler					MDF Sander Baghouse		Inline Saw Baghouse		Material Balance													
			Fuel Combustion		Natural Gas Combustion			Wood Drying		Press		Total	Baghouse				Total	Passive Ventilation		Forced Ventilation				No. 12		No. 13																			
			Wood	Natural Gas	Dryer		RCO	Wood		Press			No. 8	No. 9	No. 10	No. 11		Roof Vent Group 1	Roof Vent Group 2	Forced Ventilation				No. 12		No. 13																			
			(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ^(b) (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)	(lb/yr) ⁽¹⁾ (g/s) ^(a)												
Model ID	--	--	BLR_WD	BLR_NG	DRY_NG	RCO_NG	RCO	RCO	RCO	RCO	--	FORM1BH	FORM2BH	FORM4BH	FORM5BH	PRESSFUG	--	BC2	BC3	BC1	SANDBH	SAWBH	COATINGS	--	--	--	--	--	--	--	--	--	--	--	--										
Emissions Fraction Estimate ^(a)	--	--	--	--	--	--	--	--	--	--	--	0.25	0.25	0.25	0.25	--	--	0.050	0.050	0.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--										
1,1,1-Trichloroethane (methyl chloroform)	71-55-6	Yes	32.2	4.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32.2	4.6E-04										
1,2-Dichloropropane (propylene dichloride)	78-87-5	Yes	9.35	1.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.35	1.3E-04											
Acetaldehyde	75-07-0	Yes	157	2.3E-03	1.68	2.4E-05	--	--	0.64	9.1E-06	1,640	0.024	289	4.2E-03	--	--	--	24.8	3.6E-04	118	5.92	8.5E-05	5.92	8.5E-05	107	1.5E-03	--	--	--	--	--	--	2,231	0.032											
Acrolein	107-02-8	Yes	145	2.1E-03	1.46	2.1E-05	--	--	0.55	8.0E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	183	2.6E-03											
Benzene	71-43-2	Yes	545	7.8E-03	3.15	4.5E-05	--	--	1.19	1.7E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	550	7.9E-03											
Bromomethane (methyl bromide)	74-83-9	Yes	6.29	9.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.29	9.0E-05											
Carbon tetrachloride	56-23-5	Yes	5.49	7.9E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.49	7.9E-05											
Chlorine	7782-50-5	Yes	440	6.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	6.3E-03											
Chlorobenzene	108-90-7	Yes	9.24	1.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.24	1.3E-04											
Chloroform	67-66-3	Yes	11.2	1.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.2	1.6E-04											
Chloromethane (methyl chloride)	74-87-3	Yes	24.2	3.5E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24.2	3.5E-04											
Cumene	98-82-8	Yes	9.85	1.4E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.85	1.4E-04											
Ethylbenzene	100-41-4	Yes	6.79	9.8E-05	3.74	5.4E-05	1.24	1.8E-05	1.41	2.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.2	1.9E-04												
Ethylene glycol monobutyl ether	111-76-2	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	142	2.0E-03	142	2.0E-03										
Formaldehyde	50-00-0	Yes	584	8.4E-03	6.67	9.6E-05	--	--	2.52	3.6E-05	11,986	0.17	--	--	--	--	243	3.5E-03	5,746	287	4.1E-03	287	4.1E-03	5,171	0.074	1,143	0.016	--	--	--	--	--	19,712	0.28											
Hexane	110-54-3	Yes	160	2.3E-03	2.49	3.6E-05	0.82	1.2E-05	0.94	1.4E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	165	2.4E-03											
Hydrochloric acid	7647-01-0	Yes	70.1	1.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	70.1	1.0E-03											
Hydrogen fluoride	7664-39-3	Yes	50.4	7.2E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50.4	7.2E-04											
Isopropyl alcohol (isopropanol)	67-63-0	Yes	2,515	0.036	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	126	1.8E-03	2,641	0.038										
Methanol	67-56-1	Yes	407	5.9E-03	--	--	--	--	--	--	9,713	0.14	--	6,751	1,688	0.024	1,688	0.024	1,688	0.024	411	5.9E-03	6,502	325	4.7E-03	325	4.7E-03	5,852	0.084	2,183	0.031	1,854	0.027	--	27,822	0.40									
Methyl ethyl ketone	78-93-3	Yes	3.88	5.6E-05	--	--	--	--	--	--	30.6	4.4E-04	--	--	--	--	262	3.8E-05	18.1	0.90	1.3E-05	0.90	1.3E-05	16.3	2.3E-04	--	--	--	--	--	--	--	55.2	7.9E-04											
Methyl isobutyl ketone	108-10-1	Yes	--	--	--	--	--	--	--	--	476	6.8E-03	923	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,478	0.021											
Methylene diphenyl diisocyanate (MDI)	101-68-8	Yes	--	--	--	--	--	--	--	--	482	6.9E-03	212	3.0E-03	--	--	18.2	2.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	712	0.010											
Dichloromethane (methylene chloride)	75-09-2	Yes	221	3.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	221	3.2E-03											
Phenol	108-95-2	Yes	89.0	1.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	89.0	1.3E-03											
Propionaldehyde	123-38-6	Yes	173	2.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	173	2.5E-03											
Propylene	115-07-1	Yes	--	--	287	4.1E-03	95.0	1.4E-03	109	1.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	491	7.1E-03											
Propylene glycol monomethyl ether	107-98-2	Yes	--	--	287	4.1E-03	95.0	1.4E-03	109	1.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.3	2.5E-04	17.3	2.5E-04										
Styrene	100-42-5	Yes	261	3.8E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	261	3.8E-03											
Toluene	108-88-3	Yes	6.34	9.1E-05	14.4	2.1E-04	--	--	5.43	7.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26.1	3.8E-04											
Xylenes	1330-20-7	Yes	2.90	4.2E-05	10.7	1.5E-04	--	--	4.04	5.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.6	2.5E-04											
Antimony and compounds	7440-36-0	Yes	0.17	2.4E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.17	2.4E-06											
Arsenic and compounds	7440-38-2	Yes	1.05	1.5E-05	2.4E-03	3.4E-08	2.3E-03	3.2E-08	0.045	6.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.10	1.6E-05											
Beryllium and compounds	7440-41-7	Yes	0.016	2.3E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.016	2.3E-07											
Cadmium and compounds	7440-43-9	Yes	0.18	2.6E-06	0.012	1.7E-07	0.011	1.6E-07	0.23	3.2E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.43	6.2E-06											
Chromium VI	18540-29-9	Yes	0.15	2.2E-06	6.1E-04	8.7E-09	5.7E-04	8.3E-09	0.011	1.7E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.16	2.4E-06											
Cobalt and compounds	7440-48-4	Yes	0.28	4.0E-06	9.1E-04	1.3E-08	8.6E-04	1.2E-08	0.017	2.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.30	4.3E-06											
Copper and compounds	7440-50-8	Yes	2.11	3.0E-05	9.2E-03	1.3E-07	8.7E-03	1.3E-07	0.17	2.5E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.30	3.3E-05											
Lead and compounds	7439-92-1	Yes	2.90	4.2E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.90	4.2E-05											
Manganese and compounds	7439-94-5	Yes	53.3	7.7E-04	4.1E-03	5.9E-08	3.9E-03	5.6E-08	0.078	1.1E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	53.3	7.7E-04											
Mercury and compounds	7439-97-6	Yes	0.068	9.8																																									

Table 3-4
DEQ-Approved Daily Emission Rates—RBC Only
Roseburg Forest Products—Medford, Oregon

Toxic Air Contaminant	CAS	RBC? (Yes/No)	Daily Emission Estimates (Units)																												Total Facility Daily Emissions Estimate									
			Boiler 4				Dryers 2 & 3 / Press Captured / RCO							MDF Former ^(B)									Press Fugitives		MDF Board Cooler ^(B)								MDF Sander Baghouse		Inline Saw Baghouse		Material Balance			
			Fuel Combustion		Natural Gas Combustion		Wood Drying		Press	Total	Baghouse									Total	Passive Ventilation				Forced Ventilation															
			Wood	Natural Gas	Dryer	RCO	No. 8	No. 9			No. 10	No. 11	Rooftop Vent Group 1	Rooftop Vent Group 2																										
			(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)	(lb/day) ⁽¹⁾	(g/s) ^(a)			(lb/day) ⁽¹⁾	(g/s)	(g/s)					
			Model ID	--	--	BLR_WD	BLR_NG	DRY_NG	RCO_NG	RCO	RCO	--	FORM1BH	FORM2BH	FORM4BH	FORM5BH	PRESSFUG	--	BC2	BC3	BC1	SANDBH	SAWBH	COATINGS	--	--														
Emissions Fraction Estimate ⁽²⁾	--	--	--	--	--	--	--	--	--	0.25	0.25	0.25	0.25	--	--	0.050	0.050	0.90	--	--	--	--	--																	
1,1,1-Trichloroethane (methyl chloroform)	71-55-6	Yes	0.11	5.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	5.6E-04																
1,2-Dichloropropane (propylene dichloride)	78-87-5	Yes	0.031	1.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.031	1.6E-04																	
Acetaldehyde	75-07-0	Yes	0.52	2.7E-03	5.6E-03	2.9E-05	--	--	1.7E-03	9.1E-06	6.21	0.033	1.09	5.7E-03	--	0.094	4.9E-04	0.45	0.022	1.2E-04	0.022	1.2E-04	0.40	2.1E-03	8.38	0.044														
Acrolein	107-02-8	Yes	0.48	2.5E-03	4.9E-03	2.6E-05	--	--	1.5E-03	8.0E-06	--	--	--	--	--	--	0.14	6.9E-03	3.6E-05	6.9E-03	3.6E-05	0.12	6.5E-04	0.63	3.3E-03															
Benzene	71-43-2	Yes	1.81	9.5E-03	0.010	5.5E-05	--	--	3.3E-03	1.7E-05	--	--	--	--	--	--	--	--	--	--	--	--	1.82	9.6E-03																
Bromomethane (methyl bromide)	74-83-9	Yes	0.021	1.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.021	1.1E-04																
Carbon tetrachloride	56-23-5	Yes	0.018	9.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.018	9.6E-05																
Chlorine	7782-50-5	Yes	1.46	7.7E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.46	7.7E-03																
Chlorobenzene	108-90-7	Yes	0.031	1.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.031	1.6E-04																
Chloroform	67-66-3	Yes	0.037	2.0E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.037	2.0E-04																
Chloromethane (methyl chloride)	74-87-3	Yes	0.080	4.2E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.080	4.2E-04																
Cumene	98-82-8	Yes	0.033	1.7E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.033	1.7E-04																
Ethylbenzene	100-41-4	Yes	0.023	1.2E-04	0.012	6.5E-05	3.4E-03	1.8E-05	3.9E-03	2.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.042	2.2E-04																
Ethylene glycol monobutyl ether	1111-76-2	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.45	2.4E-03																	
Formaldehyde	50-00-0	Yes	1.94	0.010	0.022	1.2E-04	--	--	6.9E-03	3.6E-05	45.4	0.24	--	--	0.92	4.8E-03	21.8	1.09	5.7E-03	1.09	5.7E-03	19.6	0.10	4.33	0.023	74.4	0.39													
Hexane	110-54-3	Yes	0.53	2.8E-03	8.3E-03	4.3E-05	2.3E-03	1.2E-05	2.6E-03	1.4E-05	--																													

Notes

(a) Emission rate (g/s) = (daily emissions estimate [lb/day]) x (453.592 g/lb) x (day/24 hrs) x (hr/3,600 s)

(b) Emission rate (lb/day) = (total emissions estimate [lb/day]) x (emissions fraction estimate)

References:

(1) Emissions estimate obtained from DEQ-approved emissions inventory per letter dated January 8, 2020.

(2) Emissions fraction equally apportioned between ventilation points, and is estimated based on general orientation of the ventilation point in relation to the emission source

Table 3–5
Proposed Model Source Parameters
Roseburg Forest Products—Medford, Oregon

Point Sources											
Model ID	Model Source Description	UTM Coordinates ⁽¹⁾		Emission Rate ⁽²⁾ (g/s)	Discharge Orientation ⁽¹⁾	Base Elevation ⁽³⁾ (m)	Release Height ⁽¹⁾ (m)	Stack Diameter ⁽¹⁾ (m)	Exit Velocity ⁽¹⁾ (m/s)	Exit Flowrate ^(a) (m ³ /s)	Exit Temperature ⁽¹⁾ (K)
		Eastings	Northing								
BOILER	Boiler at Baghouse Stack	509,019.69	4,688,238.9	1.00	Vertical	408.2	18.29	1.219	14.15	16.52	464.8
RCO	Press and Face-Core Dryers to RCO	509,181.80	4,688,354.4	1.00	Vertical	407.4	15.24	2.375	16.76	74.24	357.0
BC1	Board Cooler Exhaust Pressurized Vent	508,962.20	4,688,384.3	1.00	Capped	407.0	13.60	1.244	11.66	14.16	308.2
FORM1BH	Former Head 1 Baghouse 8	509,061.38	4,688,344.5	1.00	Horizontal	407.1	11.89	1.459	5.645	9.439	305.4
FORM2BH	Former Head 2 Baghouse 9	509,048.39	4,688,355.0	1.00	Horizontal	407.0	11.89	1.459	5.645	9.439	320.4
FORM4BH	Former Head 4 Baghouse 10	509,051.86	4,688,349.3	1.00	Horizontal	407.1	11.89	1.459	5.645	9.439	320.4
FORM5BH	Former Head 5 Baghouse 11	509,057.74	4,688,350.3	1.00	Horizontal	407.1	11.89	1.459	5.645	9.439	305.4
SANDBH	Sander Baghouse 12	508,956.69	4,688,356.1	1.00	Vertical	407.1	4.572	1.676	19.24	42.48	Ambient
SAWBH	Inline Saw Baghouse 13	508,944.91	4,688,364.2	1.00	Vertical	407.2	4.115	0.814	22.68	11.80	Ambient
Volume Sources											
Model ID	Model Source Description	UTM Coordinates ⁽¹⁾		Emission Rate ⁽²⁾ (g/s)	Base Elevation ⁽³⁾ (m)	Release Height ⁽¹⁾ (m)	Length of Side ⁽¹⁾ (m)	Initial Lateral Dimension ^(b) (m)	Initial Vertical Dimension ^(c) (m)		
		Eastings	Northing								
COATINGS	Finished Goods Warehouse Coating Usage	508,933.88	4,688,453.2	1.00	406.7	13.60	25.00 ⁽⁶⁾	5.814		6.321	
PRESSFUG	Press Fugitive Exhaust Not Captured	508,989.61	4,688,384.0	1.00	406.9	14.63	15.24 ⁽⁷⁾	3.544		6.805	
BC2	Board Cooler Passive Vents-Group 1	508,955.05	4,688,390.0	1.00	407.0	13.60	4.500 ⁽⁸⁾	1.047		6.321	
BC3	Board Cooler Passive Vents-Group 2	508,967.37	4,688,383.9	1.00	407.0	13.60	4.500 ⁽⁸⁾	1.047		6.321	

Notes:

(a) Exit flowrate (m³/s) = (π/4) x (stack diameter [m])² x (exit velocity [m/s])

(b) Initial lateral dimension (m) = (length of side [m]) / (4.3) (4)

(c) Initial vertical dimension (m) = (building height [m]) / (2.15) (4)

Building 1 height (m) = 13.59 (5)

Building 2-Tier 2 height (m) = 14.63 (5)

References:

(1) Value based on information provided by Roseburg Forest Products.

(2) Dispersion model will be executed using unit-emission rates.

(3) Base elevation derived from the US Geological Survey National Elevation Dataset downloaded and processed in AERMAP.

(4) See "User's Guide for the AMS/EPA Regulatory Model (AERMOD)," EPA-454/B-18-001 dated April 2018. Assumes elevated source on or adjacent to a building.

(5) See Table 4–6, Summary of Downwash Structure Heights.

(6) Length of side based on relative location for coating product use within the finished goods warehouse.

(7) Length of side based on physical dimensions for the MDF press partial enclosure.

(8) Length of side based on general extents of roof vent groupings and a review of aerial imagery.

Table 4–3
Assessment of Missing Meteorological Data
Roseburg Forest Products—Medford, Oregon

Quarter ⁽¹⁾	Meteorological Data Assessment per Year														
	2014			2015			2016			2017			2018		
	Total Hours ⁽¹⁾	Missing Hours ⁽²⁾	Available ^(a) (%)	Total Hours ⁽¹⁾	Missing Hours ⁽²⁾	Available ^(a) (%)	Total Hours ⁽¹⁾	Missing Hours ⁽²⁾	Available ^(a) (%)	Total Hours ⁽¹⁾	Missing Hours ⁽²⁾	Available ^(a) (%)	Total Hours ⁽¹⁾	Missing Hours ⁽²⁾	Available ^(a) (%)
Q1	2,160	2	99.9%	2,160	9	99.6%	2,184	28	98.7%	2,160	2	99.9%	2,160	2	99.9%
Q2	2,184	0	100.0%	2,184	3	99.9%	2,184	33	98.5%	2,184	17	99.2%	2,184	2	99.9%
Q3	2,208	0	100.0%	2,208	21	99.0%	2,208	16	99.3%	2,208	0	100.0%	2,208	22	99.0%
Q4	2,208	20	99.1%	2,208	1	100.0%	2,208	8	99.6%	2,208	0	100.0%	2,208	35	98.4%

Notes:

(a) Available hours (%) = $(1 - \{\text{missing hours} / \{\text{total hours}\}\}) \times (100\%)$

References:

- (1) Total hours obtained from the surface and profile files generated using AERMET (version 19191) for the period between 2014 through 2018. The combined 5-year meteorological dataset is representative of the Rogue Valley International-Medford Airport monitoring station (WBAN: 24225).
- (2) The number of missing hours was determined by exporting a surface "QA" file to excel via AERMET (version 19191).

Table 4–4
AERSURFACE Settings
Roseburg Forest Products—Medford, Oregon

Parameter	Setting
Study radius for surface roughness	1.0 kilometer
Are the surface data collected at an airport?	Yes
Should continuous snow cover be assumed?	No
Is this an arid region?	No
Is this an airport site?	Yes
Number of sectors	12
Months assumed to constitute "winter"	December, January, and February
Months assumed to constitute "spring"	March, April, and May
Months assumed to constitute "summer"	June, July, and August
Months assumed to constitute "autumn"	September, October, and November
Period for land use calculations	Monthly

Table 4–5
Surface Soil Moisture Condition Assessment
Roseburg Forest Products—Medford, Oregon

Calendar Year	Annual Precipitation ⁽¹⁾ (in)	Climatic Significance ⁽²⁾ (in)	Calendar Year Soil Moisture ⁽³⁾ (in)
2014	20.25	Upper 70th Percentile	Wet
2015	17.48	Middle 40th Percentile	Average
2016	21.71	Upper 70th Percentile	Wet
2017	18.13	Middle 40th Percentile	Average
2018	12.06	Lower 30th Percentile	Dry

30-Year Climate Precipitation Data ⁽⁴⁾	
Average Annual Precipitation ⁽⁵⁾	18.34
Lower 30th Percentile Annual Precipitation ⁽⁶⁾	16.90
Upper 70th Percentile Annual Precipitation ⁽⁷⁾	20.24

References:

- (1) Climatological data obtained from National Oceanic and Atmospheric Administration National Climatic Data Center for Rogue Valley-Medford International Airport located in Medford, Oregon (WBAN: 24225).
- (2) Climatic significance represents annual precipitation compared to 30-year climatological period.
- (3) Surface moisture conditions correspond to "Dry", "Average" or "Wet" soil content determined by comparing annual precipitation to 30-year climatological period. This method is consistent with the methodology set forth in the current version of the US EPA AERSURFACE User's Guide dated January 16, 2013.
- (4) Represents 30-year period between 1990 and 2019. Period chosen as most current 30-year period available.
- (5) Represents average annual precipitation during 30-year climatological period.
- (6) Represents lower limit of middle 40th percentile annual precipitation during 30-year climatological period.
- (7) Represents upper limit of middle 40th percentile annual precipitation during 30-year climatological period.

Table 4–6
Summary of Downwash Structure Heights
Roseburg Forest Products—Medford, Oregon

Downwash Structure Model ID	Base Elevation ⁽¹⁾		Number of Building Tiers	Tier Height ⁽²⁾	
	(ft)	(m)		(ft)	(m)
BLD_1	1,333	406.3	1	44.6	13.6
BLD_2, Tier 1	1,335	406.9	1	35.0	10.7
BLD_2, Tier 2	1,335	406.9	2	48.0	14.6
BLD_3	1,337	407.6	1	44.3	13.5
BLD_4	1,335	406.9	1	25.0	7.6
BLD_5	1,337	407.4	1	25.0	7.6
BLD_6	1,336	407.3	1	35.0	10.7
BLD_7	1,336	407.1	1	25.0	7.6
BLD_8	1,336	407.2	1	25.0	7.6
BLD_9	1,336	407.4	1	32.8	10.0
BLD_10	1,338	407.8	1	32.8	10.0
BLD_11	1,338	408.0	1	16.4	5.0
BLD_12	1,340	408.3	1	35.5	10.8
BLD_13	1,338	408.0	1	74.1	22.6
BLD_14	1,338	407.8	1	74.1	22.6
BLD_15	1,340	408.4	1	38.0	11.6
BLD_16	1,336	407.2	1	25.0	7.6
BLD_17	1,336	407.2	1	25.0	7.6
BLD_18	1,337	407.4	1	25.0	7.6
BLD_19	1,336	407.2	1	25.0	7.6
BLD_20	1,336	407.1	1	25.0	7.6
BLD_21	1,336	407.2	1	25.0	7.6
BLD_22	1,336	407.2	1	25.0	7.6
BLD_26	1,338	407.9	1	53.0	16.2
BLD_24	1,338	407.9	1	50.0	15.2
BLD_25	1,339	408.1	1	55.0	16.8
BLD_27	1,339	408.0	1	55.0	16.8
BLD_28	1,338	408.0	1	55.0	16.8
BLD_29	1,338	407.9	1	50.0	15.2
BLD_30	1,338	407.7	1	50.0	15.2

References:

- (1) Base elevation derived from 1/3-arc second United States Geological Survey National Elevation Data via AERMAP View processor.
- (2) Information provided by Roseburg Forest Products.

Table 4–9
Summary of Statewide Zoning and Exposure Type Classification
Roseburg Forest Products—Medford, Oregon

Oregon Statewide Zoning Descriptions ⁽¹⁾	Corresponding Exposure Type Classification	Risk Assessments To Be Performed
Beaches and Dunes	Acute-only	Acute Noncancer
Coastal Estuarine	Acute-only	Acute Noncancer
Coastal Shorelands	Acute-only	Acute Noncancer
Combo equal emphasis	Acute-only	Acute Noncancer
Combo with priority emphasis	Acute-only	Acute Noncancer
Commercial - Central	Non-Residential Worker or Child (if applicable)	Cancer, Chronic and Acute Noncancer
Commercial - General	Non-Residential Worker or Child (if applicable)	Cancer, Chronic and Acute Noncancer
Commercial - Neighborhood	Non-Residential Worker or Child (if applicable)	Cancer, Chronic and Acute Noncancer
Commercial - Office	Non-Residential Worker or Child (if applicable)	Cancer, Chronic and Acute Noncancer
Exclusive Farm Use 160+	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Exclusive Farm Use 20+	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Exclusive Farm Use 40+	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Exclusive Farm Use 80	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Federal Forest	Acute-only	Acute Noncancer
Federal Range	Acute-only	Acute Noncancer
Forest	Acute-only	Acute Noncancer
Future Urban Development	Residential	Cancer, Chronic and Acute Noncancer
High-density Res.	Residential	Cancer, Chronic and Acute Noncancer
Indian reservation/tribal trust	Residential	Cancer, Chronic and Acute Noncancer
Industrial - Heavy	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Industrial - Light	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Industrial Campus	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Industrial Office	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Low-density Res.	Residential	Cancer, Chronic and Acute Noncancer
Marginal Farm Land 10+	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Medium High-density Res.	Residential	Cancer, Chronic and Acute Noncancer
Medium Low-density Res.	Residential	Cancer, Chronic and Acute Noncancer
Medium-density Res.	Residential	Cancer, Chronic and Acute Noncancer
Mineral and Aggregate	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Mixed Farm-Forest 160+	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Mixed Farm-Forest 20	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Mixed Farm-Forest 40	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Mixed Farm-Forest 80	Residential for structure, Non-Residential Worker for property	Cancer, Chronic and Acute Noncancer
Mixed-Use Com. & Res. Extremely High	Residential	Cancer, Chronic and Acute Noncancer
Mixed-Use Com. & Res. High	Residential	Cancer, Chronic and Acute Noncancer
Mixed-Use Com. & Res. Low	Residential	Cancer, Chronic and Acute Noncancer
Mixed-Use Com. & Res. Med-high	Residential	Cancer, Chronic and Acute Noncancer
Mixed-Use Com. & Res. Medium	Residential	Cancer, Chronic and Acute Noncancer
Mixed-Use Com. & Res. V.High	Residential	Cancer, Chronic and Acute Noncancer
No Data	Acute-only	Acute Noncancer
Open Space/Conservation	Acute-only	Acute Noncancer
Other	Acute-only	Acute Noncancer
Parks & Open Space	Acute-only	Acute Noncancer
Prime Forest 80	Acute-only	Acute Noncancer
Public & semi-public Uses	Non-Residential Worker or Child (if applicable)	Cancer, Chronic and Acute Noncancer
Public Facilities	Non-Residential Worker or Child (if applicable)	Cancer, Chronic and Acute Noncancer
Rural Commercial	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Rural Industrial	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Rural Residential 1 acre	Residential	Cancer, Chronic and Acute Noncancer
Rural Residential 10 acres	Residential	Cancer, Chronic and Acute Noncancer
Rural Residential 2-4 acres	Residential	Cancer, Chronic and Acute Noncancer
Rural Residential 5 acres	Residential	Cancer, Chronic and Acute Noncancer
Secondary Forest 80	Acute-only	Acute Noncancer
UC Rural Commercial	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
UC Rural Industrial	Non-Residential Worker	Cancer, Chronic and Acute Noncancer
Very High-density Res.	Residential	Cancer, Chronic and Acute Noncancer
Very Low-density Res.	Residential	Cancer, Chronic and Acute Noncancer

References:

(1) Oregon statewide zoning descriptions obtained from the Department of Land Conservation and Development statewide zoning dataset.

Table 4–10
Summary of Revisions to Statewide Zoning
Roseburg Forest Products—Medford, Oregon

UTM Coordinates (m)		Zoning Dataset Used for Exposure Classification			Exposure Type Classification	Reason for Exposure Type Classification Revision
Easting	Northing	Statewide	City of Medford	Jackson County		
509,084.66	4,688,512	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,109.66	4,688,512	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,134.66	4,688,487	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,134.66	4,688,512	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,159.66	4,688,487	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,159.66	4,688,512	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,184.66	4,688,462	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,184.66	4,688,487	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,184.66	4,688,512	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,209.66	4,688,487	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,209.66	4,688,512	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,209.66	4,688,537	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,209.66	4,688,562	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,234.66	4,688,537	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,234.66	4,688,562	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,259.66	4,688,262	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,259.66	4,688,287	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,259.66	4,688,537	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,259.66	4,688,562	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,284.66	4,688,262	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,284.66	4,688,287	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,284.66	4,688,537	Commercial - General	Single-Family Residential - 6 Units	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,284.66	4,688,562	Commercial - General	Single-Family Residential - 6 Units	Zoning Not Available	Residential	Revised to Residential due Saint Vincent De Paul low income housing assistance.
509,359.66	4,688,212	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,384.66	4,688,212	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,384.66	4,688,237	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,434.66	4,688,237	Commercial - General	Heavy Commercial	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
509,434.66	4,688,637	Medium-density Res.	Community Commercial	Zoning Not Available	Residential	Revised to Residential due to location of Autumn Glen Apartments affordable housing.
509,434.66	4,688,662	Medium-density Res.	Community Commercial	Zoning Not Available	Residential	Revised to Residential due to location of Autumn Glen Apartments affordable housing.
509,434.66	4,688,687	High-density Res.	Community Commercial	Zoning Not Available	Residential	Revised to Residential due to location of Autumn Glen Apartments affordable housing.
509,459.66	4,688,687	High-density Res.	Community Commercial	Zoning Not Available	Residential	Revised to Residential due to location of Autumn Glen Apartments affordable housing.
509,484.66	4,688,687	High-density Res.	Community Commercial	Zoning Not Available	Residential	Revised to Residential due to location of Autumn Glen Apartments affordable housing.
508,859.66	4,689,312	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
508,859.66	4,689,362	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
508,909.66	4,689,312	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
508,909.66	4,689,362	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
508,959.66	4,689,312	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
508,959.66	4,689,362	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,009.66	4,689,312	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,009.66	4,689,362	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,309.66	4,689,212	High-density Res.	Multiple-Family Residential - 20 Units	Zoning Not Available	Child	Revised to Child exposure type due to Alan Berlin Head Start child care location.
509,309.66	4,689,262	High-density Res.	Multiple-Family Residential - 20 Units	Zoning Not Available	Child	Revised to Child exposure type due to Alan Berlin Head Start child care location.
509,359.66	4,689,262	High-density Res.	Multiple-Family Residential - 20 Units	Zoning Not Available	Child	Revised to Child exposure type due to Alan Berlin Head Start child care location.
508,809.66	4,689,462	Medium-density Res.	Public Parks	Zoning Not Available	Child	Revised to Child exposure type due to school location.
508,909.66	4,689,462	Medium-density Res.	Single-Family Residential - 6 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,009.66	4,689,462	Medium-density Res.	Single-Family Residential - 6 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,509.66	4,690,162	Industrial - Light	Light Industrial District	Zoning Not Available	Acute	Revised to Acute exposure type based on review of aerial imagery.
509,609.66	4,690,062	Industrial - Light	Light Industrial District	Zoning Not Available	Acute	Revised to Acute exposure type based on review of aerial imagery.
509,709.66	4,689,962	Industrial - Light	Light Industrial District	Zoning Not Available	Acute	Revised to Acute exposure type based on review of aerial imagery.

Table 4–10
Summary of Revisions to Statewide Zoning
Roseburg Forest Products—Medford, Oregon

UTM Coordinates (m)		Zoning Dataset Used for Exposure Classification			Exposure Type Classification	Reason for Exposure Type Classification Revision
Easting	Northing	Statewide	City of Medford	Jackson County		
509,809.66	4,689,762	Industrial - Light	Light Industrial District	Zoning Not Available	Acute	Revised to Acute exposure type based on review of aerial imagery.
509,809.66	4,689,962	Industrial - Light	Light Industrial District	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,809.66	4,690,062	Industrial - Light	Light Industrial District	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,909.66	4,689,662	Industrial - Light	Light Industrial District	Zoning Not Available	Acute	Revised to Acute exposure type based on review of aerial imagery.
509,909.66	4,689,962	Industrial - Light	Light Industrial District	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,909.66	4,690,062	Industrial - Light	Light Industrial District	Zoning Not Available	Child	Revised to Child exposure type due to school location.
510,009.66	4,689,562	Industrial - Light	Light Industrial District	Zoning Not Available	Acute	Revised to Acute exposure type based on review of aerial imagery.
510,109.66	4,687,862	Commercial - General	Regional Commercial	Zoning Not Available	Child	Revised to Child due to location of Wee Watch 'em daycare within the Rogue Valley mall.
510,209.66	4,687,862	Commercial - General	Regional Commercial	Zoning Not Available	Child	Revised to Child due to location of Wee Watch 'em daycare within the Rogue Valley mall.
510,309.66	4,686,962	Medium-density Res.	Community Commercial	Zoning Not Available	Child	Revised to Child exposure type due to school location.
510,809.66	4,688,062	High-density Res.	Multiple-Family Residential - 20 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
510,809.66	4,687,962	High-density Res.	Multiple-Family Residential - 20 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
510,909.66	4,688,062	Medium Low-density Res.	Single-Family Residential - 4 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
511,009.66	4,688,062	Medium Low-density Res.	Single-Family Residential - 4 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,809.66	4,686,362	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,709.66	4,686,362	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,609.66	4,686,362	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,309.66	4,686,662	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,309.66	4,686,562	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,209.66	4,686,662	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,109.66	4,686,662	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,009.66	4,686,662	Medium-density Res.	Public Parks	Zoning Not Available	Worker	Revised to Worker exposure type based on review of aerial imagery.
509,009.66	4,686,562	Medium-density Res.	Public Parks	Zoning Not Available	Worker	Revised to Worker exposure type based on review of aerial imagery.
508,909.66	4,686,562	Medium-density Res.	Public Parks	Zoning Not Available	Worker	Revised to Worker exposure type based on review of aerial imagery.
507,609.66	4,687,162	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,609.66	4,687,062	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,509.66	4,687,162	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,509.66	4,687,062	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,009.66	4,687,662	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,009.66	4,687,962	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,209.66	4,691,162	Medium-density Res.	Zoning Not Available	Zoning Not Available	Child	Revised to Child exposure type due to school location.
511,209.66	4,687,162	Very High-density Res.	Multiple-Family Residential - 30 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
507,609.66	4,685,962	Commercial - General	Single-Family Residential - 1 Unit	Zoning Not Available	Child	Revised to Child exposure type due to school location.
507,409.66	4,685,962	Very Low-density Res.	Single-Family Residential - 1 Unit	Zoning Not Available	Child	Revised to Child exposure type due to school location.
507,409.66	4,685,762	Exclusive Farm Use 80	Single-Family Residential - 1 Unit	Zoning Not Available	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,209.66	4,685,962	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
507,209.66	4,685,762	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,409.66	4,685,362	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,209.66	4,686,162	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,209.66	4,685,962	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,209.66	4,685,762	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,009.66	4,685,562	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,809.66	4,687,762	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,809.66	4,687,962	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.
506,409.66	4,687,962	Exclusive Farm Use 80	Zoning Not Available	Exclusive Farm Use	Residential	Revised to Residential exposure type based on review of aerial imagery.

Table 4–10
Summary of Revisions to Statewide Zoning
Roseburg Forest Products—Medford, Oregon

UTM Coordinates (m)		Zoning Dataset Used for Exposure Classification			Exposure Type Classification	Reason for Exposure Type Classification Revision
Easting	Northing	Statewide	City of Medford	Jackson County		
506,409.66	4,691,162	Public & semi-public Uses	Zoning Not Available	Zoning Not Available	Child	Revised to Child exposure type due to school location.
506,409.66	4,691,362	Public & semi-public Uses	Zoning Not Available	Zoning Not Available	Child	Revised to Child exposure type due to school location.
506,509.66	4,691,862	Public & semi-public Uses	Zoning Not Available	Zoning Not Available	Child	Revised to Child exposure type due to school location.
512,509.66	4,688,362	Medium Low-density Res.	Single-Family Residential - 4 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
510,509.66	4,684,862	Medium-density Res.	Single-Family Residential - 10 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
509,009.66	4,683,362	Rural Residential 5 acres	Single-Family Residential - 6 Units	Zoning Not Available	Child	Revised to Child exposure type due to school location.
504,509.66	4,688,362	Rural Residential 5 acres	Zoning Not Available	Rural Residential - 5	Child	Revised to Child exposure type due to school location.

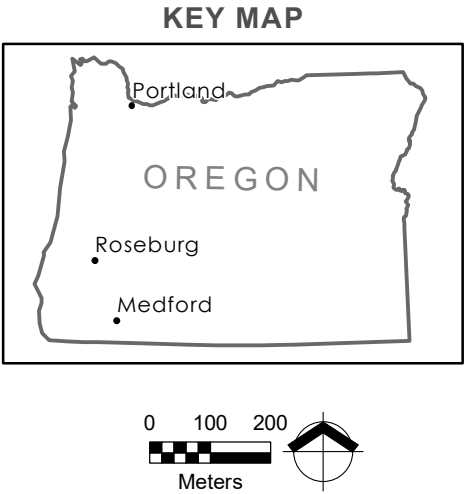
FIGURES





Figure 2-1
Aerial Photograph of Facility
Roseburg Forest Products
Medford, Oregon

- Legend**
-  School Location (2015-16)
 -  UTM Grid Guideline
 -  Property Boundary



Source: Aerial photograph obtained from Esri
ArcGIS Online



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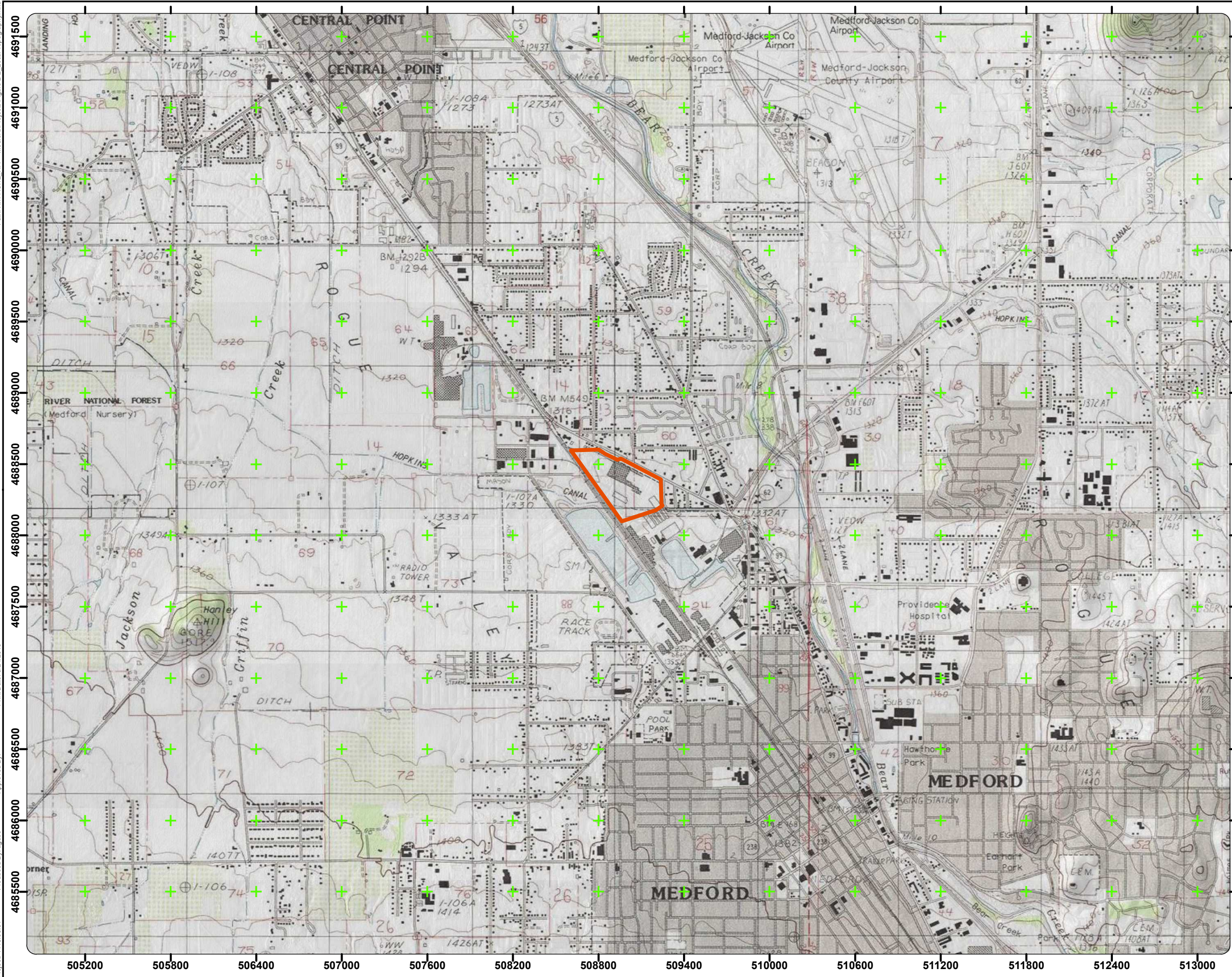
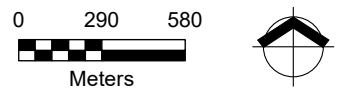
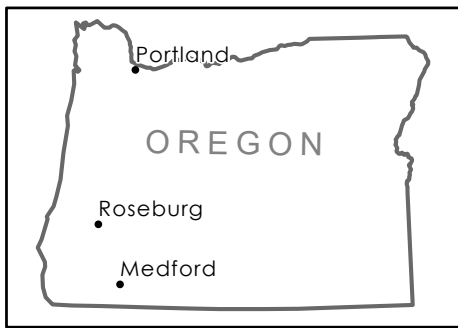


Figure 2-2
Local Topography
Roseburg Forest Products
Medford, Oregon

- Legend**
- Property Boundary
 - UTM Grid Guideline

KEY MAP



Source: Topographic map obtained from USGS.

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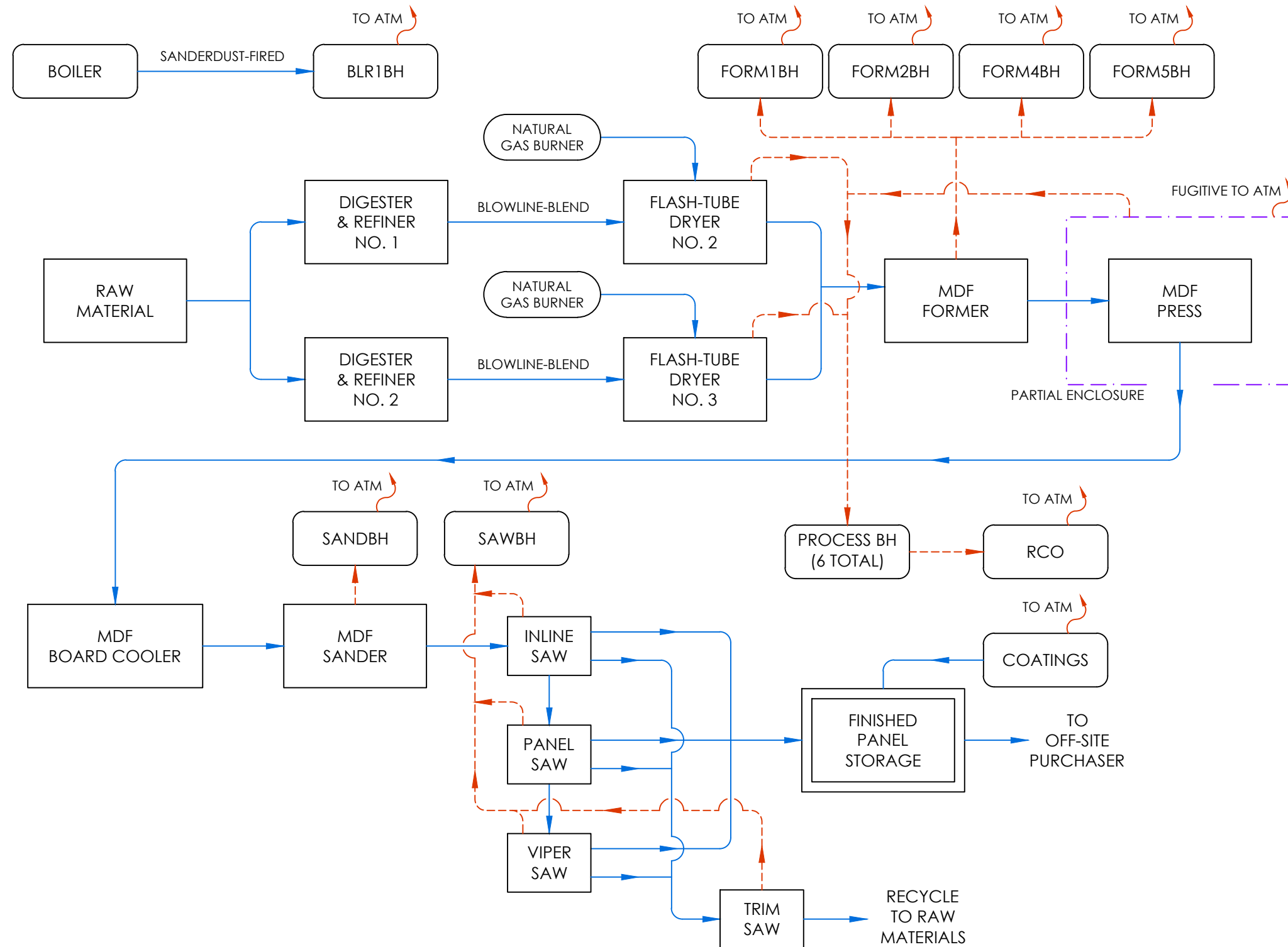


Figure 2-3
Process Flow Diagram
Roseburg Forest Products
Medford, Oregon

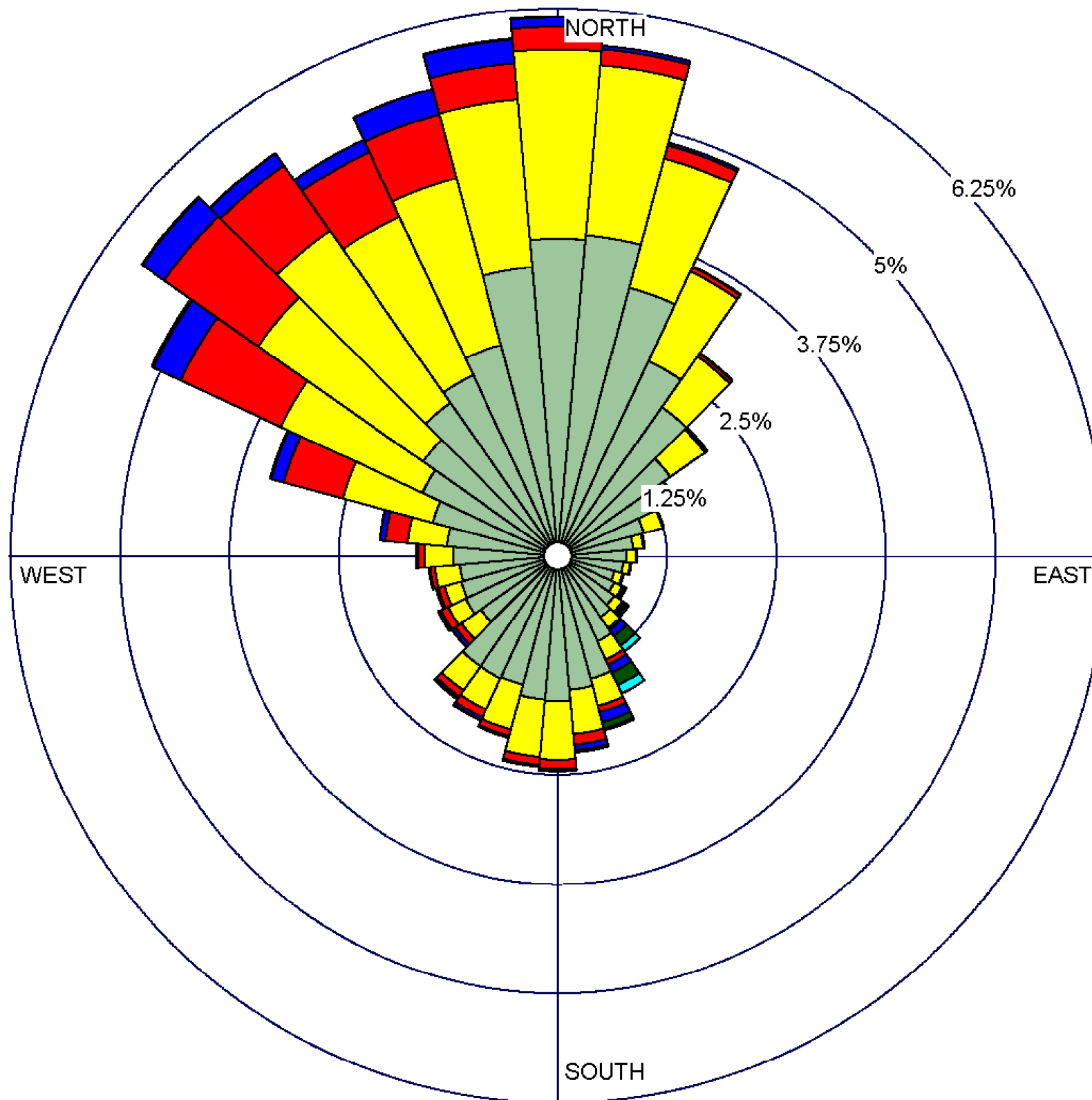


Figure 4-1 Wind Rose

Roseburg Forest Products
Medford, Oregon

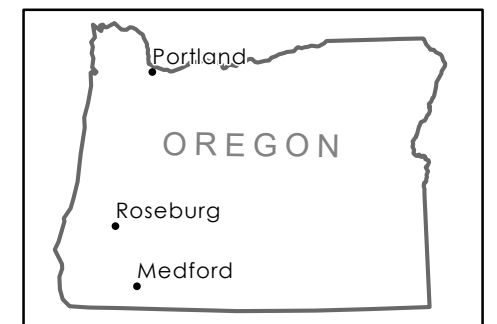
Legend

WIND SPEED
(m/s)

- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 0.20 - 2.00

Calms: 1.67%

KEY MAP



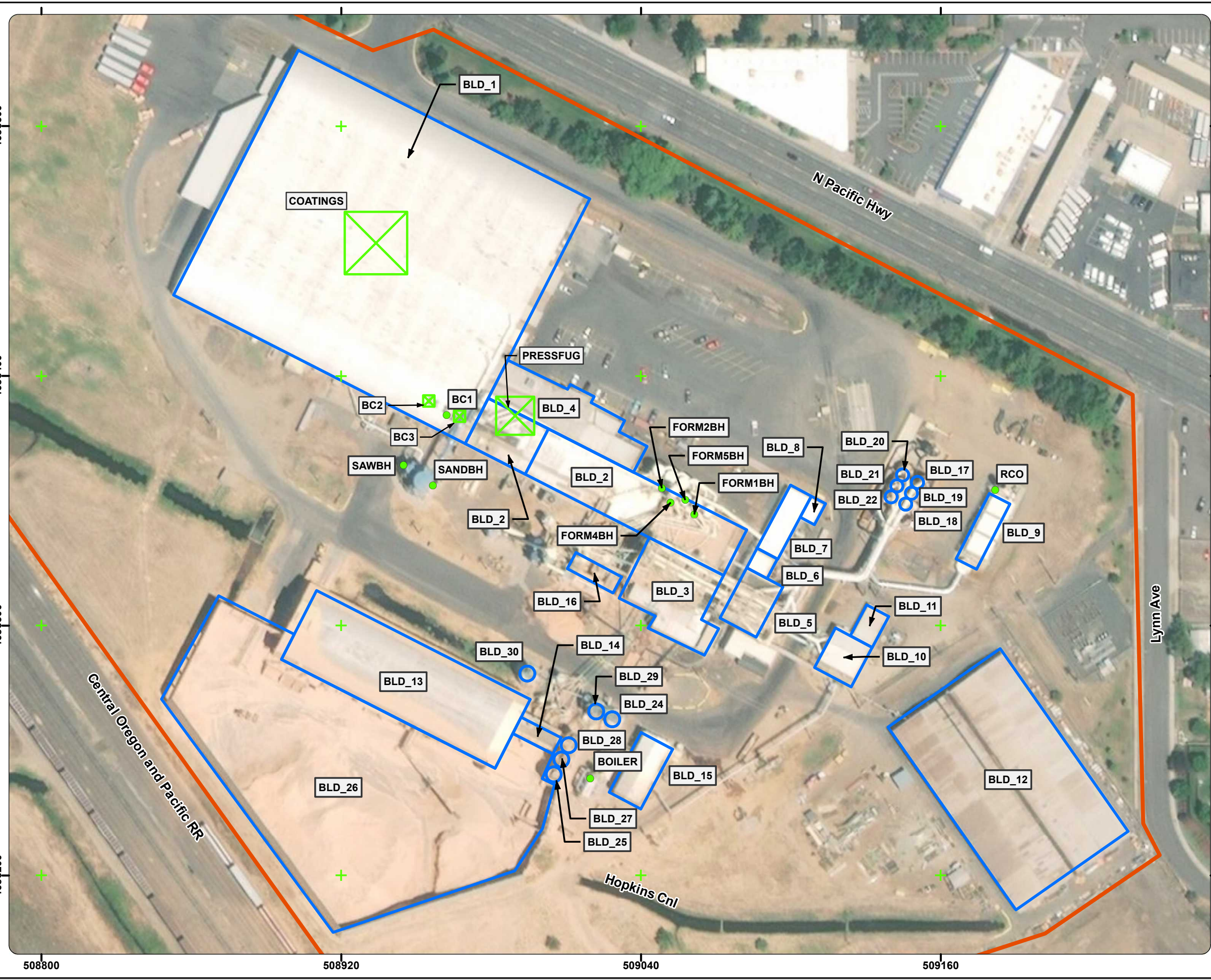
Notes:
Data from Station #24225 - Medford/Jackson
Country Airport, OR, for dates 1/1/2014-
12/31/2018.
Average Wind Speed = 2.23 m/s
Total number of hours = 43,724
Wind Direction = Blowing from



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Path: X:\1419\12_RFP - Medford\Projects\Figure 4-2_Proposed Downwash Structures and Emission Source Locations.mxd
Project: 1443.03.01
Produced By: aguse
Approved By:
Print Date: 2/5/2020



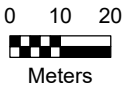
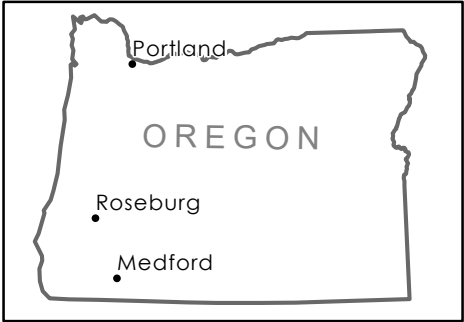
**Figure 4-2
Proposed Downwash
Structures and Emission
Source Locations**

Roseburg Forest Products
Medford, Oregon

Legend

- Proposed Point Source Location
- Proposed Volume or Area Source Location
- Proposed Downwash Structure
- Modeling Boundary
- UTM Grid Guideline

KEY MAP



Source: Aerial photograph obtained from Esri
ArcGIS Online

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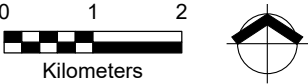
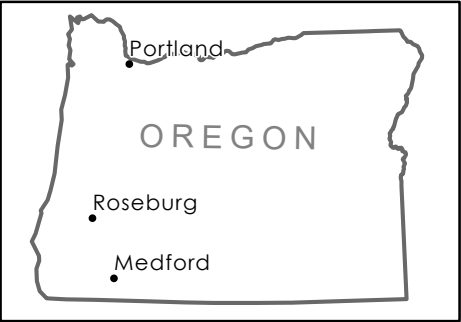
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Print Date: 5/11/2020
Approved By:
Produced By: aguse
Project: 1443.03.01

Figure 4-3
Proposed Receptor Locations
Roseburg Forest Products
Medford, Oregon

Legend

- Proposed Receptors
- Proposed Receptor in Road or Rail Right-of-Way
- Property Boundary
- + UTM Grid Guideline

KEY MAP



Source: Aerial photograph obtained from Esri
ArcGIS Online



This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Project: 1443.03.01 Produced By: aguse Approved By: Print Date: 5/12/2020 Path: X:\1419.12 RFP - Medford\Projects\Figure 4-4 Proposed Receptor Locations in the Immediate Area.mxd

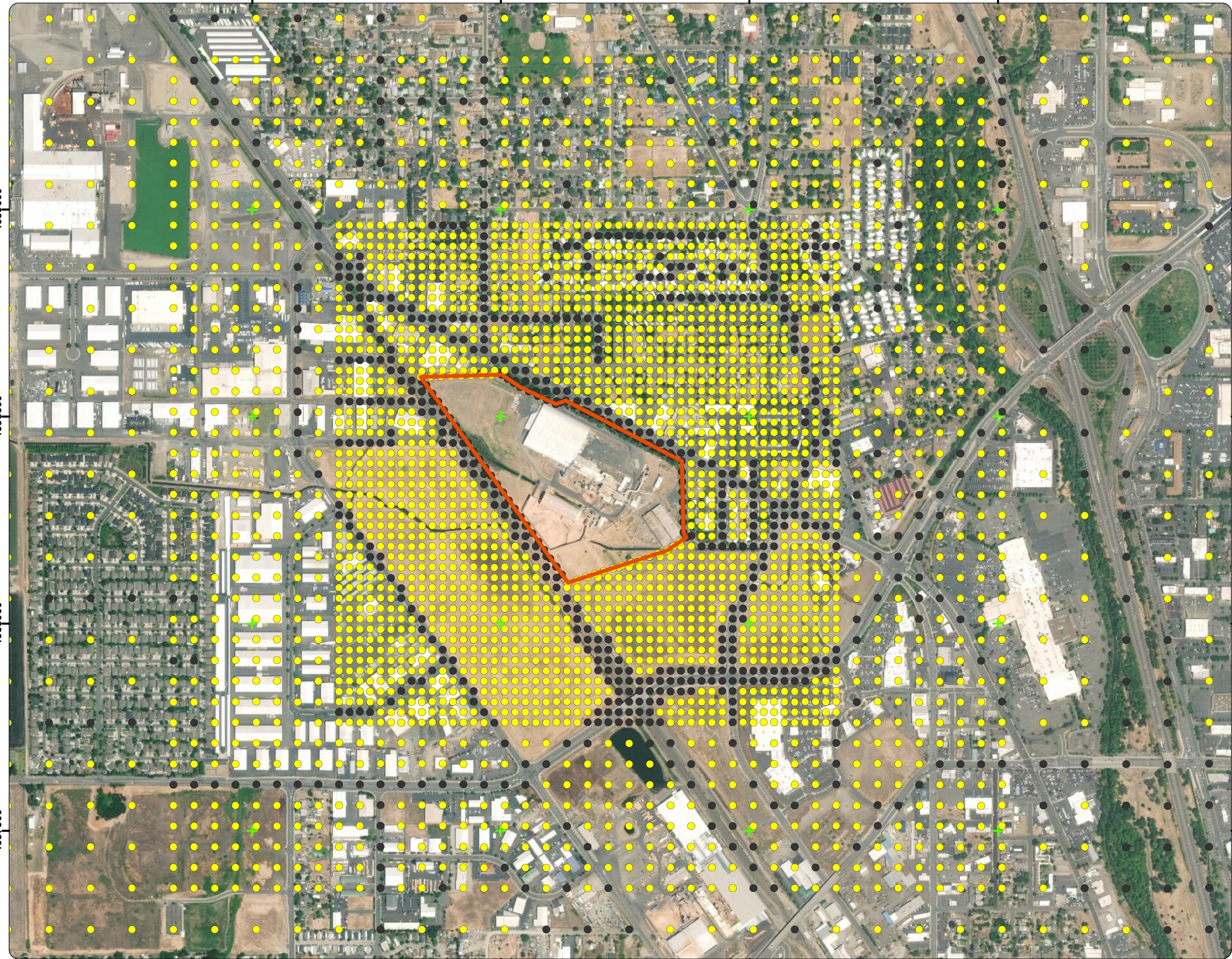
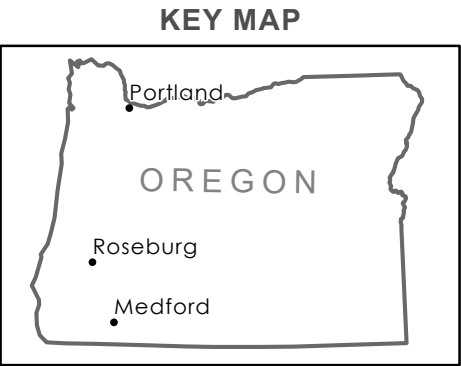


Figure 4-4
Proposed Receptor Location
in the Immediate Area
Roseburg Forest Products
Medford, Oregon

- Legend**
- Proposed Receptors
 - Proposed Receptor in Road or Rail Right-of-Way
 - Property Boundary
 - + UTM Grid Guideline



Source: Aerial photograph obtained from Esri
ArcGIS Online

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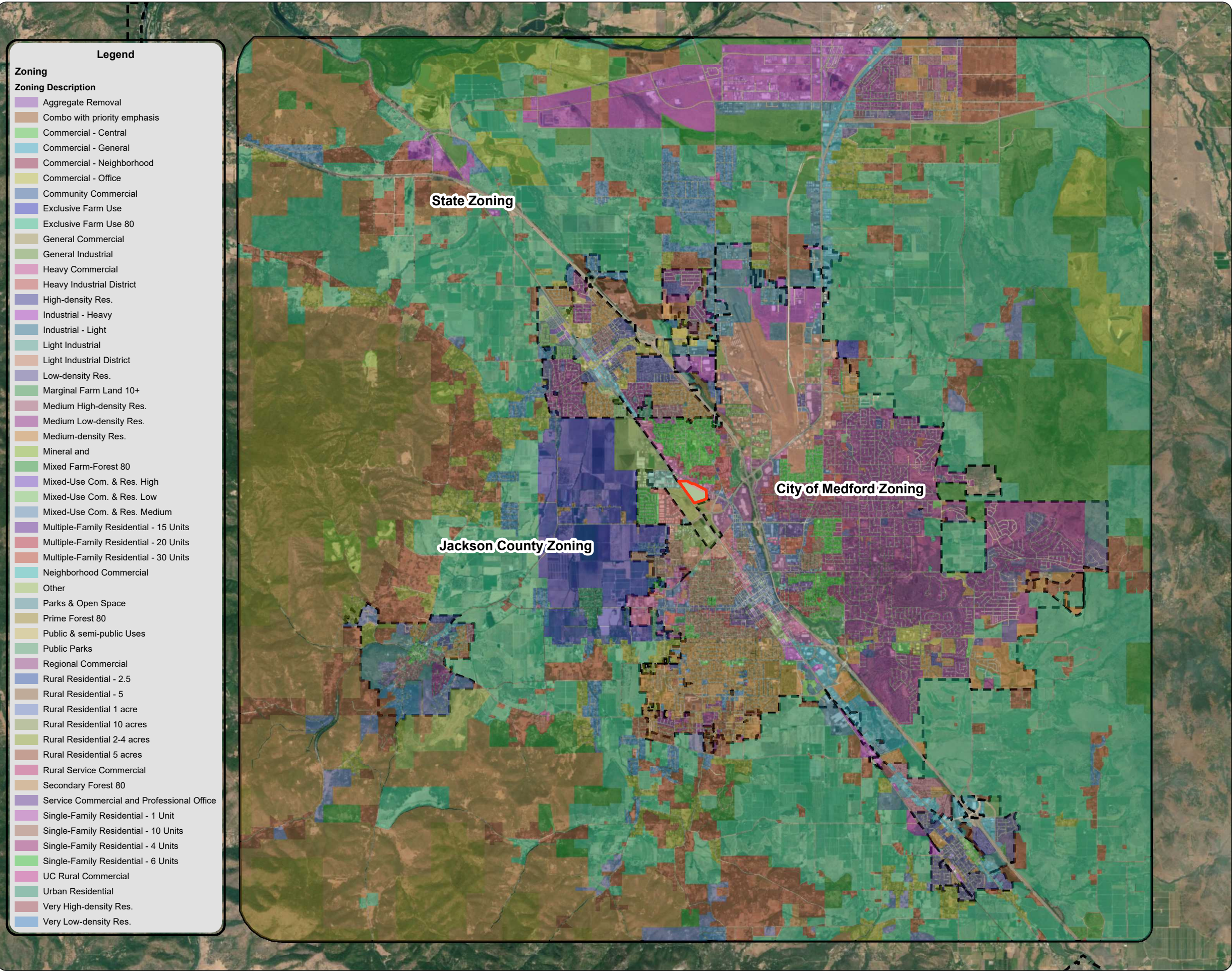
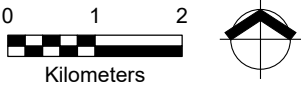


Figure 4-5
Existing Land-Use
Zoning Classifications
Roseburg Forest Products
Medford, Oregon

- Legend**
- Property Boundary
 - Proposed Modeling Domain Extents
 - City Limits (2018)



Source: Aerial photograph obtained from Esri ArcGIS Online. Parcel and road data obtained from Jackson County. Zoning comprised of City of Medford, Jackson Co., & State of Oregon data.

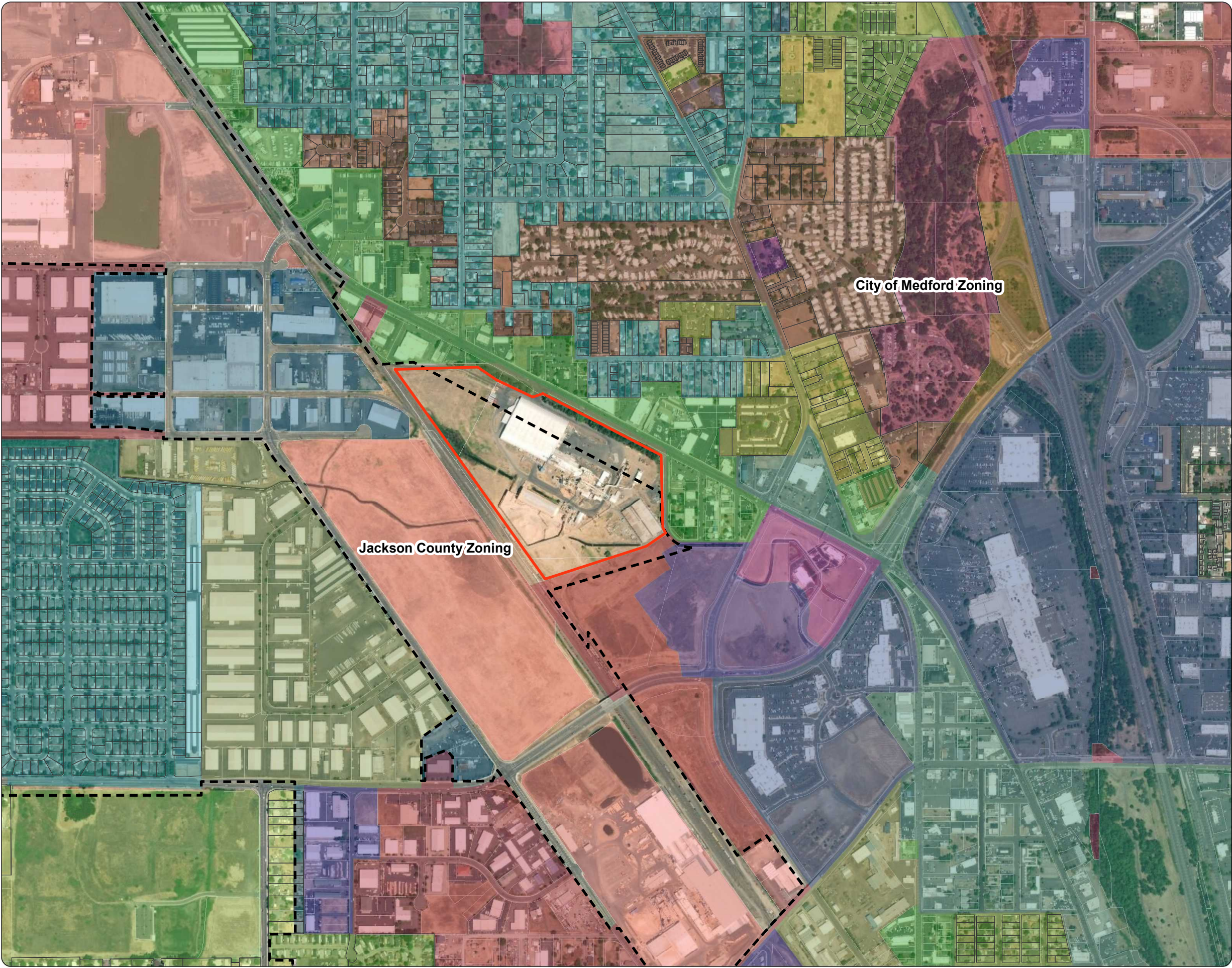
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Path: X:\1419_12_RFP - Medford\Projects\Figure 4-6 Existing Land-Use Zoning Classifications Immediate.mxd
Print Date: 1/31/2020
Approved By:
Produced By: aguse
Project:

Figure 4-6
Existing Land-Use Zoning
Classifications in the
Immediate Area

Roseburg Forest Products
Medford, Oregon



Legend

- Property Boundary
 - City Limits (2018)
 - Residential Zoned Parcel
 - Parcel
- City of Medford Zoning**
- Community Commercial
 - General Industrial
 - Heavy Commercial
 - Heavy Industrial District
 - Light Industrial District
 - Multiple-Family Residential - 20 Units
 - Multiple-Family Residential - 30 Units
 - Neighborhood Commercial
 - Public Parks
 - Regional Commercial
 - Service Commercial and Professional Office
 - Single-Family Residential - 1 Unit
 - Single-Family Residential - 10 Units
 - Single-Family Residential - 4 Units
 - Single-Family Residential - 6 Units
- Jackson County Zoning**
- Exclusive Farm Use (EFU)
 - General Industrial (GI)
 - Light Industrial (LI)
 - Residential

0 50 100
Meters



Source: Aerial photograph obtained from Esri
ArcGIS Online. Parcel and land-use zoning data
obtained from Jackson County. Zoning comprised
of City of Medford, Jackson Co., & State of Oregon data.

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Figure 4-7 Proposed Exposure Categorization

Roseburg Forest Products
Medford, Oregon

Legend

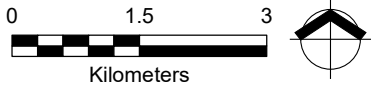
- Property Boundary
- Proposed Modeling Domain Extents
- City Limits (2018)
- Tax Lots

Zoning

RBC Classification

- Residential
- Child
- Worker
- Acute

1. Land-use zoning data obtained from the City of Medford, Jackson County, and the State of Oregon.
2. Existing land-use zoning classifications revised to reflect one of the four risk-based concentration categories presented in Oregon Administrative Rule 340-245-8040 Table 4.
3. Non-taxlot land-use zoning areas (e.g., interstate right-of-way) will not be assessed for cancer or noncancer risk.



Source: Aerial photograph obtained from Esri ArcGIS Online. Parcel and road data obtained from Jackson County. Zoning comprised of City of Medford, Jackson Co., & State of Oregon data.



This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

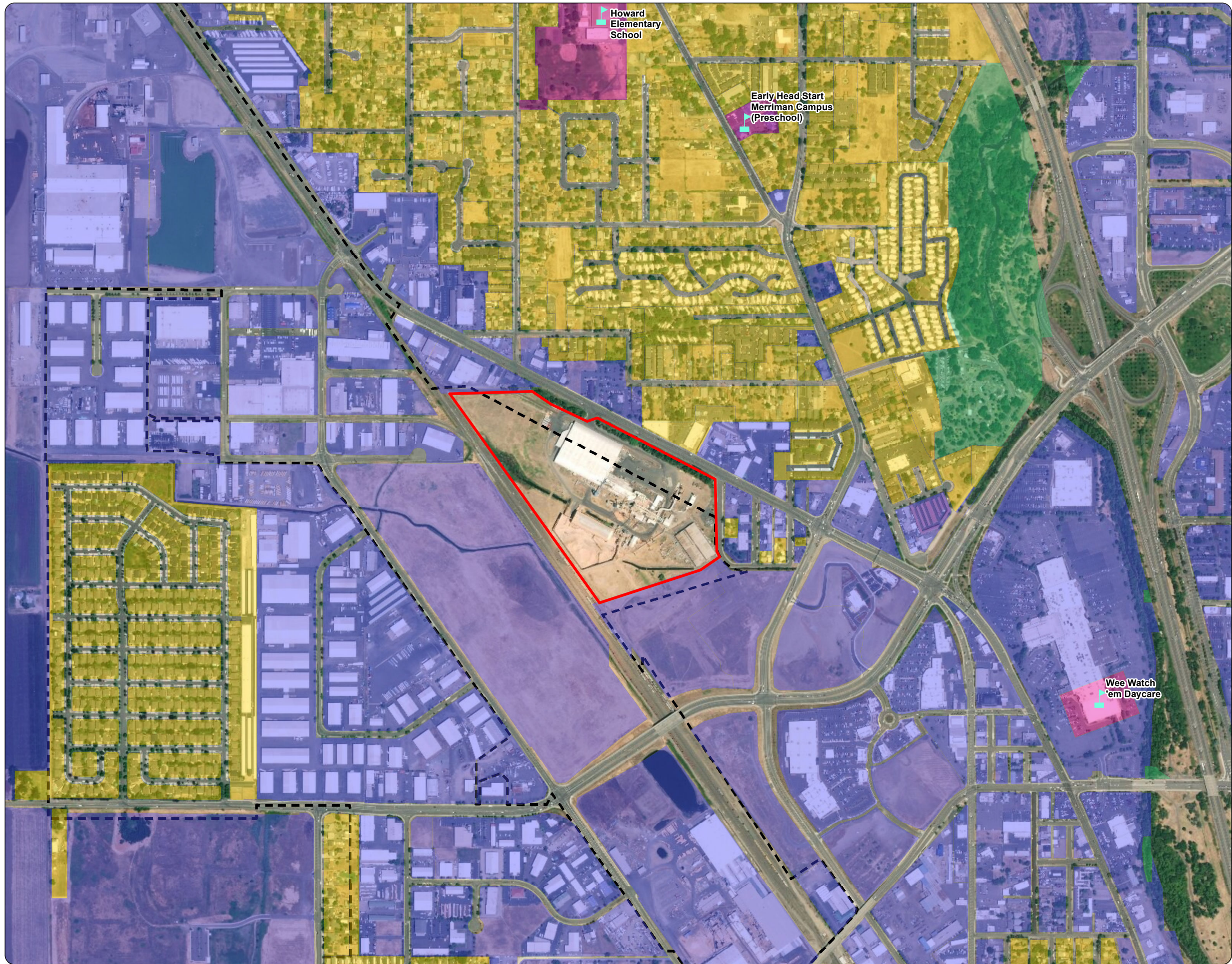


Figure 4-8
Proposed Exposure
Categorization in the
Immediate Area
Roseburg Forest Products
Medford, Oregon

Legend

Property Boundary

City Limits (2018)

School Location (2015-16)

Zoning

RBC Classification

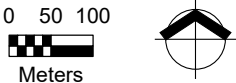
Residential

Child

Worker

Acute

1. Land-use zoning data obtained from the City of Medford, Jackson County, and the State of Oregon.
2. Existing land-use zoning classifications revised to reflect one of the four risk-based concentration categories presented in Oregon Administrative Rule 340-245-8040 Table 4.
3. Non-taxlot land-use zoning areas (e.g., interstate right-of-way) will not be assessed for cancer or noncancer risk.



Source: Aerial photograph obtained from Esri ArcGIS Online. Parcel data obtained from Jackson County. Zoning comprised of City of Medford, Jackson Co., & State of Oregon data.