CLEANER AIR OREGON—
RISK ASSESSMENT WORK PLAN

STIMSON LUMBER COMPANY FOREST GROVE COMPLEX
GASTON, OREGON

Prepared for

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

CLEANER AIR OREGON AIR TOXICS PROGRAM

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ACRONYMS AND ABBREVIATIONS

CAO	Cleaner Air Oregon
DEQ	Department of Environmental Quality (Oregon)
DEQ-approved emissions inventory	emissions inventory approved by the DEQ on March 29, 2023
the facility	sawmill and wet process hardboard plant
g/s	grams per second
MFA	Maul Foster & Alongi, Inc.
OAR	Oregon Administrative Rule
RALs	risk action levels
RAWP	Risk Assessment Work Plan
RBC	risk-based concentration
Stimson	Stimson Lumber Company
TAC	toxic air contaminant
TEUs	toxic emissions units
Title V permit	Title V Permit No. 34-2066-TV-01
ug/m^3	microgram per cubic meter

1 INTRODUCTION

Stimson Lumber Company (Stimson) owns and operates a sawmill and wet process hardboard plant (alternatively referred to as the Forest Grove Complex) located at 49800 SW Scoggins Valley Road in Gaston, Oregon (the facility). The facility currently operates under Title V Permit No. 34-2066-TV-01 (the Title V permit) originally issued by the Oregon Department of Environmental Quality (DEQ) on May 21, 2002. The DEQ is currently in the process of issuing an updated Title V permit for the facility.

Maul Foster & Alongi, Inc. (MFA), has been retained by Stimson to assist the facility with the Cleaner Air Oregon (CAO) permitting process. Stimson submitted a toxic air contaminant (TAC) emissions inventory to the DEQ on September 30, 2020. Subsequent revisions were made until a final emissions inventory was approved by the DEQ on March 29, 2023 (DEQ-approved emission inventory). Stimson submitted a modeling protocol for Level 3 risk assessment to the DEQ on April 27, 2023. Stimson intends to conduct a Level 3 risk assessment to determine 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 (RALs) shown in OAR 340-245-8010 Table 1. As stated in OAR 340-245-0030(1)(c), a Level 3 Risk Assessment Work Plan (RAWP) must be submitted to the DEQ no later than 60 days after receiving DEQ approval of the CAO emission inventory. As the approval occurred on March 29, 2023, the RAWP is due on May 29, 2023.

The remainder of this RAWP outlines the proposed methodology for completing the Level 3 Risk Assessment for the facility and presents specific information required by OAR 340-245-0210(2). In order to avoid duplicating efforts, CAO modeling protocol sections relevant to the RAWP are directly referenced where applicable.

2 CONCEPTUAL SITE MODEL

Sections 2 and 3 of the CAO modeling protocol discuss the facility location, process description, toxic emission units (TEUs), and TAC emission estimates to satisfy the requirements set forth under OAR 340-245-0210(1). Dispersion model IDs are presented in Tables 3-1 through 3-2 of the CAO modeling protocol with applicable DEQ-approved annual and daily TAC emission rates for Significant TEUs.

2.1 Exempt Gas Combustion TEUs

The specific procedures for assessing the risk of each TEU is dependent on the TEU designation per OAR 340-245-0050(4). Per OAR 340-245-0050(5), the gas combustion "exemption applies to TEUs that solely combust natural gas, propane, [or] liquefied petroleum gas." There are no TEUs at the

facility that represent sources of natural gas, propane, or liquified petroleum gas combustion emissions. Therefore, no TEUs qualify for the gas combustion exemption.

2.2 Aggregated TEUs

A Level 3 Risk Assessment will be conducted that includes all facility TEUs. This assessment will be used to determine whether the facility exceeds the source permit RAL per OAR 340-245-0050(7). After completion of the Level 3 Risk Assessment, if it is determined that one or more of the assessed cancer or noncancer facility risks exceed the source permit RAL, Stimson will determine which, if any, TEUs at the facility may be collectively grouped into the Aggregated TEU category. Aggregated TEUs "means all of a source's TEUs that are identified by an owner or operator with total cumulative risk less than the Aggregate TEU Level" per OAR 340-245-0020(8). The excess cancer risk Aggregate TEU RAL is equal to 2.5 chances-in-one-million, and the noncancer hazard index Aggregate TEU RAL is equal to 0.1 as established under OAR 340-245-8010 Table 1 for existing sources.

Cancer and noncancer risks will be reported separately for Aggregated (if any) and Significant TEUs. Risks associated with Aggregated TEUs will be compared with the applicable Aggregated TEU RALs. For compliance demonstration, only calculated risks associated with Significant TEUs and, if applicable, Aggregated TEUs, will be compared with the applicable RALs.

3 EXPOSURE ASSESSMENT

3.1 Land-Use Zoning Classification—Exposure Types

Section 4 of the CAO modeling protocol provides details relevant to the exposure assessment, including the dispersion modeling approach used to estimate TAC concentrations at exposure locations, and the corresponding exposure type classifications to satisfy the requirements set forth under OAR 340-245-0210(2)(b).

3.2 Exposure Pathways

A Level 3 Risk Assessment is proposed in this RAWP. It is assumed that cancer and noncancer risk (i.e., chronic and acute hazard index) resulting from facility TEUs will not have additional exposure pathways (i.e., ingestion or injection) other than those already accounted for in each RBC. Moreover, based on a review of land-use zoning classifications and aerial imagery, there are no known locations that might present additional exposure pathways, such as a nearby farm where subsistence farming practices may occur. Since no additional exposure pathways are present, a Level 4 Risk Assessment is not warranted.

4 RISK CHARACTERIZATION

4.1 Risk-Based Concentrations

Excess cancer risk and chronic and acute noncancer risk will be assessed using the most current RBCs available as shown in OAR 340-245-8010 Table 2. The TACs from the approved CAO emissions inventory and corresponding RBCs to be included in the proposed Level 3 Risk Assessment are presented in Table 4-1.

4.2 Risk Estimates

As described in Section 4.4 of the CAO modeling protocol, a single dispersion model will be executed using a unit emission rate of 1 gram per second (g/s) for each TEU for annual (chronic cancer and noncancer) assessments. The maximum modeled unit concentration in micrograms per cubic meter (ug/m^3) at each modeled receptor for the annual averaging period will be considered a modeled "dispersion factor" in units of ug/m^3 per g/s. Risk estimates will be determined for each TEU by multiplying this dispersion factor by the TAC-specific emission rate (g/s) presented in the approved CAO emission inventory to produce a maximum predicted model concentration for a specific TAC. The maximum predicted model concentration for a specific TAC will be divided by the appropriate RBC. The resulting risk for all TACs will be summed for each Significant TEU. For all Significant TEUs at each exposure location, the calculated risks will be summed to obtain the total excess cancer risk and the total chronic noncancer hazard index.

For the 24-hour (acute) assessment, MFA developed risk equivalent emission rates for each Significant TEU. The proposed risk equivalent emission rates were calculated by dividing the individual TAC emission rate for each Significant TEU by their respective acute RBC. The resulting value for each TAC was then summed together to create a total risk equivalent emission rate for the Significant TEU. This process was repeated for each Significant TEU at the facility. The risk equivalent emission rates will be modeled for the 24-hour averaging period to assess the cumulative acute risk from the facility. The proposed risk equivalent emission rates for the Significant TEUs are provided in Table 3-3 of the CAO modeling protocol.

4.2.1 Example Calculation—Level 3 Risk Assessment

Example calculations for estimating excess cancer risk and chronic noncancer hazard index for a single proposed exposure location are presented in Equation 1 and Equation 2 to satisfy the requirements set forth under OAR 340-245-0210(2)(c).

Equation 1.

$$\text{Excess Cancer Risk (chances-in-a-million)} = \sum \frac{(\text{TAC annual emission rate [g/s]}) \times \left(\text{proposed TEU dispersion factor } \left[\frac{\mu g/m^3}{g/s}\right]\right)}{(\text{applicable RBC at exposure location } [ug/m^3])}$$

Equation 2.

$$\text{Chronic Noncancer Hazard Index} = \sum \frac{(\text{TAC annual emission rate [g/s]}) \times \left(\text{proposed TEU dispersion factor } \left[\frac{\mu g/m^3}{g/s}\right]\right)}{(\text{applicable RBC at exposure location [ug/m}^3\text{]})}$$

The total facility excess cancer risk and chronic noncancer hazard index will be derived by summing each individual TAC risk contribution at each proposed exposure location.

The example calculation for estimating the acute noncancer hazard index for a single proposed exposure location is presented in Equation 3.

Equation 3.

$$\text{Acute Noncancer Hazard Index} = \sum \left(\text{TEU risk equivalent emission rate } \left[\frac{g/s}{ug/m^3}\right]\right) \times \left(\text{proposed TEU dispersion factor } \left[\frac{\mu g/m^3}{g/s}\right]\right)$$

The total facility acute noncancer hazard index will be derived by summing each individual Significant TEU's risk contribution at each proposed exposure location.

4.3 Revised Noncancer Risk Action Levels

The CAO rules identify certain TACs that may have developmental, reproductive, respiratory, or other noncancer severe health effects and set RALs for these TACs. The calculation of the risk determination ratio is required when facilities emit a mixture of TACs assigned noncancer Toxics Best Available Control Technology RALs of both a hazard index of 3 and a hazard index of 5, as identified in OAR 340-245-8010, Table 2. The risk determination ratio formula under OAR 340-245-0200(5) is presented below in Equation 4.

Equation 4.

$$\text{Risk Determination Ratio} = \frac{\text{Risk}_{HI3}}{3} + \frac{\text{Risk}_{HI5}}{5}$$

As shown in Table 4-1, TAC emissions from the facility are comprised of a mixture of TACs with assigned hazard indices of 3 and 5 per OAR 340-245-8010 Table 2. As a result, if the estimated facility chronic and acute noncancer risk is greater than the Community Engagement RAL, the risk determination ratio will be determined per Equation 4.

5 UNCERTAINTY ANALYSIS

Although the proposed Level 3 Risk Assessment will be conducted using the most accurate and readily available information, there are various levels of uncertainty associated with the proposed risk assessment. Per OAR 340-245-0210(2)(d), potential quantitative and qualitative uncertainties with the proposed Level 3 Risk Assessment include, but may not be limited to, the following:

Acute Assessments:

- To assess acute noncancer risk (i.e., acute hazard index), the full 24-hour exposure duration will be assumed. While it is unlikely a person would be at most of the proposed exposure locations for 24 consecutive hours, this method will provide a worst-case potential exposure duration for an individual at these locations. For example, if an employee at an identified acute exposure location only works a single, eight-hour shift, the exposure would only be a third of what is being assumed in the proposed Level 3 Risk Assessment. **Hence, the proposed Level 3 Risk Assessment may overestimate acute noncancer risk due to the 24-hour exposure duration assumption for chemicals with RBCs based on Toxicity Reference Values with an exposure period of 24-hours or more. Conversely, the proposed Level 3 Risk Assessment may underestimate acute noncancer risk for TRVs with an exposure period of less than 24 hours because the model is executed for the 24-hour averaging period.**

- The Level 3 Risk Assessment will be conducted assuming each TEU at the facility is operating at maximum potential to emit, simultaneously. For example, the boiler typically does not need to operate at the maximum potential to emit to satisfy the steam requirements of the facility. It is highly unlikely that all TEUs at the facility will operate at their maximum potential to emit for a 24-hour period simultaneously. **Therefore, the proposed Level 3 Risk Assessment likely overestimates acute noncancer risk due to unrealistic operating conditions.**

- The Level 3 Risk Assessment relies on modeling using a five-year period of hourly meteorological data. Some meteorological conditions, which may only occur a few days or less in a five-year period, result in worst-case dispersion characteristics. It is extremely unlikely that these infrequent meteorological conditions would occur at the same time that the facility is simultaneously operating all TEUs at maximum potential to emit. **Therefore, the proposed Level 3 Risk Assessment likely overestimates acute noncancer risk because of the improbability of facility operations at maximum potential to emit aligning with worst-case meteorological conditions.**

Cancer and Chronic Noncancer Assessments:

- The RBCs developed by the DEQ for excess cancer risk and chronic noncancer risk assume a 70-year exposure duration for 24 hours per day. It is unlikely that a person would remain at the same residence or in areas potentially impacted by emissions covered by the CAO program for 70 consecutive years for 24 hours per day. The risk assessments also account for a person being exposed to the local facility emission rate for the entire exposure duration (i.e., 70 years). **Therefore, the proposed Level 3 Risk Assessment will overestimate cancer and chronic noncancer risk due to the unrealistic exposure duration assumption.**

- The excess cancer risk and chronic noncancer risk assessments will be performed assuming that all TEUs operate for the course of the calendar year at their potential to emit levels. It is physically impossible that the facility could operate several of the facility TEUs at maximum potential to emit for an entire year without shutdown time for maintenance and cleaning, such

as the boiler. **Therefore, the proposed Level 3 Risk Assessment will overestimate cancer and chronic noncancer risk due to the overestimation of emissions resulting from continuous facility operation at potential to emit levels.**

All Assessments:

- Only excess cancer risk and chronic and acute noncancer hazard index from TACs that have RBCs published by the DEQ will be assessed. Table 5-1 presents a list of the TACs emitted from the facility TEUs that do not have RBCs published by the DEQ. **As a result, the proposed Level 3 Risk Assessment may not accurately assess cancer and/or noncancer risk associated with those TACs that do not yet have an associated RBC. However, the development of RBCs generally has a level of conservatism that may overestimate cancer and/or noncancer risk from TACs with known RBCs.**

- Temporal variability in meteorological conditions (e.g. ambient temperature and wind speed) and kiln operating conditions (kiln drying temperature, intake airflow) influence how emissions are released (i.e., plume rise) from the lumber kilns over the course of the batch drying time. Because emissions from the kiln are estimated using the kiln high temperature setpoint, plume rise from the kiln is also estimated using this temperature. Best available ambient temperature and wind data from the meteorological dataset used for the dispersion model were used to calculate plume rise from the kilns, as shown in Table 3-5 of the modeling protocol. **As a result of the temporal variability of plume rise from the lumber kiln, the proposed Level 3 Risk Assessment may over- or under-predict risk from the kilns during periods of variable meteorological and kiln operational conditions.**

- Emissions data for lumber kilns are representative of emissions over the duration of the drying cycle for a given kiln temperature setpoint. Due to the nature of the drying cycle, the temperature within the kiln will vary, but emissions are estimated based on the highest kiln setpoint temperature. Testing data demonstrates that the kiln emissions will decrease with decreasing temperature. **As a result of the varying temperature, and thus emissions, from the lumber kilns over the course of the drying cycle, the proposed Level 3 Risk Assessment may over- or under-predict risk from the kilns.**

6 CLOSING

MFA looks forward to working with the DEQ throughout the Cleaner Air Oregon permit application process. If there are any questions or comments regarding this RAWP, please contact Andrew Rogers at 503.407.6406 or arogers@maulfoster.com.

LIMITATIONS

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TABLES

Table 4-1
Applicable Risk-Based Concentrations
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

TAC	CAS or DEQ ID	RBC? (Yes/No)	Noncancer TBACT RAL [1]	Risk-Based Concentration [1] (ug/m^3)						
				Residential Chronic		Non-Residential Chronic				Acute
				Cancer	Noncancer	Child Cancer	Child Noncancer	Worker Cancer	Worker Noncancer	Noncancer
Antimony and compounds	7440-36-0	Yes	HI3	--	0.30	--	1.30	--	1.30	1.00
Arsenic and compounds	7440-38-2	Yes	HI3	2.4E-05	1.7E-04	1.3E-03	2.4E-03	6.2E-04	2.4E-03	0.20
Beryllium and compounds	7440-41-7	Yes	HI3	4.2E-04	7.0E-03	0.011	0.031	5.0E-03	0.031	0.020
Cadmium and compounds	7440-43-9	Yes	HI3	5.6E-04	5.0E-03	0.014	0.037	6.7E-03	0.037	0.030
Chromium VI	18540-29-9	Yes	HI3	3.1E-05	0.083	5.2E-04	0.88	1.0E-03	0.88	0.30
Cobalt and compounds	7440-48-4	Yes	HI3	--	0.10	--	0.44	--	0.44	--
Aluminum and compounds	7429-90-5	Yes	HI5	--	5.00	--	22.0	--	22.0	--
Copper and compounds	7440-50-8	Yes	HI3	--	--	--	--	--	--	100
Lead and compounds	7439-92-1	Yes	HI3	--	0.15	--	0.66	--	0.66	0.15
Manganese and compounds	7439-96-5	Yes	HI3	--	0.090	--	0.40	--	0.40	0.30
Mercury and compounds	7439-97-6	Yes	HI3	--	0.077	--	0.63	--	0.63	0.60
Nickel and compounds	7440-02-0	Yes	HI3	3.8E-03	0.014	0.10	0.062	0.046	0.062	0.20
Selenium and compounds	7782-49-2	Yes	HI3	--	--	--	--	--	--	2.00
Vanadium (fume or dust)	7440-62-2	Yes	HI3	--	0.10	--	0.44	--	0.44	0.80
Acetaldehyde	75-07-0	Yes	HI3	0.45	140	12.0	620	5.50	620	470
Acetone	67-64-1	Yes	HI3	--	31,000	--	140,000	--	140,000	62,000
Acrolein	107-02-8	Yes	HI5	--	0.35	--	1.50	--	1.50	6.90
Ammonia	7664-41-7	Yes	HI3	--	500	--	2,200	--	2,200	1,200
Benzene	71-43-2	Yes	HI3	0.13	3.00	3.30	13.0	1.50	13.0	29.0
Carbon tetrachloride	56-23-5	Yes	HI3	0.17	100	4.30	440	2.00	440	1,900
Chlorine	7782-50-5	Yes	HI3	--	0.15	--	0.66	--	0.66	170
Ethylene glycol monobutyl ether	111-76-2	Yes	HI3	--	82.0	--	360	--	360	29,000
Vinyl acetate	108-05-4	Yes	HI3	--	200	--	880	--	880	200
Chlorobenzene	108-90-7	Yes	HI3	--	50.0	--	220	--	220	--
Chloroform	67-66-3	Yes	HI3	--	300	--	1,300	--	1,300	490
1,2-Dichloropropane (Propylene dichloride)	78-87-5	Yes	HI3	--	4.00	--	18.0	--	18.0	230
3-Methylcholanthrene	56-49-5	Yes	--	1.6E-04	--	4.1E-03	--	1.9E-03	--	--
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	--	1.4E-05	--	3.7E-04	--	1.7E-04	--	--
Ethyl benzene	100-41-4	Yes	HI3	0.40	260	10.0	1,100	4.80	1,100	22,000
Formaldehyde	50-00-0	Yes	HI3	0.17	9.00	4.30	40.0	2.00	40.0	49.0
Methyl isobutyl ketone (MIBK, Hexone)	108-10-1	Yes	HI3	--	3,000	--	13,000	--	13,000	--
Isopropylbenzene (Cumene)	98-82-8	Yes	HI3	--	400	--	1,800	--	1,800	--
Hexane	110-54-3	Yes	HI3	--	700	--	3,100	--	3,100	--
Isopropyl alcohol	67-63-0	Yes	HI3	--	200	--	880	--	880	3,200
Methanol	67-56-1	Yes	HI3	--	4,000	--	18,000	--	18,000	28,000
1,3,5-Trimethylbenzene	108-67-8	Yes	HI3	--	60.0	--	260	--	260	--
Fluorides	239	Yes	HI3	--	2.30	--	20.0	--	20.0	240
1,2,3-Trimethylbenzene	526-73-8	Yes	HI3	--	60.0	--	260	--	260	--
Cyclohexane	110-82-7	Yes	HI3	--	6,000	--	26,000	--	26,000	--
Bromomethane (Methyl bromide)	74-83-9	Yes	HI3	--	5.00	--	22.0	--	22.0	3,900
Chloromethane (Methyl chloride)	74-87-3	Yes	HI3	--	90.0	--	400	--	400	1,000
1,3-Butadiene	106-99-0	Yes	HI3	0.033	2.00	0.86	8.80	0.40	8.80	660
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	Yes	HI3	--	5,000	--	22,000	--	22,000	11,000
1,2,4-Trimethyl benzene	95-63-6	Yes	HI3	--	60.0	--	260	--	260	--
Dichloromethane (Methylene chloride)	75-09-2	Yes	HI3	59.0	600	620	2,600	1,200	2,600	2,100
2-Butanone (Methyl ethyl ketone)	78-93-3	Yes	HI3	--	5,000	--	22,000	--	22,000	5,000
Phenol	108-95-2	Yes	HI3	--	200	--	880	--	880	5,800
Propionaldehyde	123-38-6	Yes	HI5	--	8.00	--	35.0	--	35.0	--
Styrene	100-42-5	Yes	HI3	--	1,000	--	4,400	--	4,400	21,000
Toluene	108-88-3	Yes	HI3	--	5,000	--	22,000	--	22,000	7,500
Xylene (mixture)	1330-20-7	Yes	HI3	--	220	--	970	--	970	8,700
Vinyl Chloride	75-01-4	Yes	HI3	0.11	100	0.22	440	2.70	440	1,300
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	HI3	0.20	2.10	3.50	9.20	2.90	9.20	2.10
m-Xylene	108-38-3	Yes	HI3	--	200	--	880	--	880	8,700
p-Xylene	106-42-3	Yes	HI3	--	200	--	880	--	880	8,700
o-Xylene	95-47-6	Yes	HI3	--	200	--	880	--	880	8,700
Hydrogen fluoride	7664-39-3	Yes	HI3	--	2.10	--	19.0	--	19.0	16.0
Hydrochloric acid	7647-01-0	Yes	HI3	--	20.0	--	88.0	--	88.0	2,100
DPM	200	Yes	HI3	0.10	5.00	2.60	22.0	1.20	22.0	--
PAHs (excluding Naphthalene)	401	Yes	--	4.3E-05	--	1.6E-03	--	3.0E-03	--	--
Benz[a]anthracene	56-55-3	Yes	--	2.1E-04	--	7.8E-03	--	0.015	--	--
Benzo[a]pyrene	50-32-8	Yes	HI3	4.3E-05	2.0E-03	1.6E-03	8.8E-03	3.0E-03	8.8E-03	2.0E-03
Benzo[b]fluoranthene	205-99-2	Yes	--	5.3E-05	--	2.0E-03	--	3.8E-03	--	--
Benzo[g,h,i]perylene	191-24-2	Yes	--	4.7E-03	--	0.17	--	0.34	--	--
Benzo[j]fluoranthene	205-82-3	Yes	--	1.4E-04	--	5.2E-03	--	0.010	--	--
Benzo[k]fluoranthene	207-08-9	Yes	--	1.4E-03	--	0.052	--	0.10	--	--
Chrysene	218-01-9	Yes	--	4.3E-04	--	0.016	--	0.030	--	--
Fluoranthene	206-44-0	Yes	--	5.3E-04	--	0.020	--	0.038	--	--
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	--	6.1E-04	--	0.022	--	0.043	--	--
Naphthalene	91-20-3	Yes	HI3	0.029	3.70	0.76	16.0	0.35	16.0	200
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	Yes	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	40321-76-4	Yes	HI3	1.0E-09	1.3E-07	9.0E-08	2.6E-05	4.2E-08	2.6E-05	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	39227-28-6	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	57653-85-7	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	19408-74-3	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	35822-46-9	Yes	HI3	1.0E-07	1.3E-05	9.0E-06	2.6E-03	4.2E-06	2.6E-03	--
Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	Yes	HI3	3.4E-06	4.2E-04	3.0E-04	0.085	1.4E-04	0.085	--
2,3,7,8-Tetrachlorodibenzofuran (TcDF)	51207-31-9	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-41-6	Yes	HI3	3.4E-08	4.2E-06	3.0E-06	8.5E-04	1.4E-06	8.5E-04	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	Yes	HI3	3.4E-09	4.2E-07	3.0E-07	8.5E-05	1.4E-07	8.5E-05	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	Yes	HI3	1.0E-08	1.3E-06	9.0E-07	2.6E-04	4.2E-07	2.6E-04	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	67562-39-4	Yes	HI3	1.0E-07	1.3E-05	9.0E-06	2.6E-03	4.2E-06	2.6E-03	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	55673-89-7	Yes	HI3	1.0E-07	1.3E-05	9.0E-06	2.6E-03	4.2E-06	2.6E-03	--
Octachlorodibenzofuran (OCDF)	39001-02-0	Yes	HI3	3.4E-06	4.2E-04	3.0E-04	0.085	1.4E-04	0.085	--
Total PCBs	1336-36-3	Yes	--	5.3E-04	--	0.020	--	9.2E-03	--	--
2,4-Dinitrotoluene	121-14-2	Yes	--	0.011	--	0.29	--	0.13	--	--
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	--	0.080	--	11.0	--	5.00	--	--
Hydrogen cyanide	74-90-8	Yes	HI3	--	0.80	--	3.50	--	3.50	340
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	HI3	0.038	7.00	1.00	31.0	0.46	31.0	--
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	HI3	0.091	60.0	2.40	260	1.10	260	12,000
2,4,6-Trichlorophenol	88-06-2	Yes	--	0.050	--	1.30	--	0.60	--	--
Pentachlorophenol	87-86-5	Yes	--	0.20	--	5.10	--	2.40	--	--
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	HI3	3.80	41.0	100	180	46.0	180	41.0

NOTES:

TAC = toxic air contaminant.

ug/m^3 = micrograms per cubic meter.

RAL = risk action level.

RBC = risk based concentration.

REFERENCES:

[1] See Oregon Administrative Rule 340-245-8010 Table 2.

Table 5-1
List of TACs with No Published Risk-Based Concentrations
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

TAC	CAS or DEQ ID	Risk-Based Concentration? [1] (Yes/No)
Barium and compounds	7440-39-3	No
Zinc oxide	1314-13-2	No
Phosphorus and compounds	504	No
Molybdenum trioxide	1313-27-5	No
Silver and compounds	7440-22-4	No
Thailium and compounds	7440-28-0	No
Zinc and compounds	7440-66-6	No
Acetophenone	98-86-2	No
Butyl benzyl phthalate	85-68-7	No
Dipropylene glycol monomethyl ether	34590-94-8	No
Crotonaldehyde	4170-30-3	No
Dibutyl phthalate	84-74-2	No
Diethylphthalate	84-66-2	No
Acenaphthene	83-32-9	No
Acenaphthylene	208-96-8	No
Anthracene	120-12-7	No
Benzo[e]pyrene	192-97-2	No
Fluorene	86-73-7	No
2-Methyl naphthalene	91-57-6	No
Perylene	198-55-0	No
Phenanthrene	85-01-8	No
Pyrene	129-00-0	No
Decachlorobiphenyl	2051-24-3	No
1-Methylphenanthrene	832-69-9	No
4,6-Dinitro-o-cresol (and salts)	534-52-1	No
di-n-octylphthalateb	518	No
4-nitrophenol	100-02-7	No
2-Chlorophenol	95-57-8	No
2,4-Dinitrophenol	51-28-5	No
Trichlorofluoromethane (Freon 11)	75-69-4	No

NOTES:

TAC = toxic air contaminant.

REFERENCES:

[1] See Oregon Administrative Rule 340-245-8010 Table 2.