Table of Contents
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Table 1
Input Process Rates and Parameters
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Source	Source ID	Process Units							
		2019 Actual Production			Requested PTE Daily			Requested PTE Year		
Hogged Fuel Fired Boilers										
Steam Production	--	307,184	(Mlb-steam/yr)	(1)	2,066	(Mlb-steam/day)	(c)	475,000	(Mlb-steam/yr)	(1)
Wood Fuel Usage	--	632,799	(MMBtu/yr)	(1)	4,257	(MMBtu/day)	(b)	978,500	(MMBtu/yr)	(b)
Total Boiler Throughput Controlled by Dry ESP	H-BLR_ESP	583,631	(MMBtu/yr)	(1)	3,205	(MMBtu/day)	(d)	922,236	(MMBtu/yr)	(e)
Total Boiler Throughput Controlled by Scrubber	H-BLR_SCR	49,168	(MMBtu/yr)	(1)	1,051	(MMBtu/day)	(g)	56,264	(MMBtu/yr)	(h)
Lumber Kilns										
Total Kiln Throughput	--	137,629	(Mbdft/yr)	(3)	960	(Mbdft/day)	(i)	180,000	(Mbdft/yr)	(3)
Kiln - Douglas Fir	LBR-DK_DF	113,966	(Mbdft/yr)	(3)	960	(Mbdft/day)	(11)	146,160	(Mbdft/yr)	(k)
Kiln - Hemlock	LBR-DK_HL	21,069	(Mbdft/yr)	(3)	960	(Mbdft/day)	(11)	30,456	(Mbdft/yr)	(m)
Kiln - True Fir	LBR-DK_TF	2,594	(Mbdft/yr)	(n)	960	(Mbdft/day)	(11)	3,384	(Mbdft/yr)	(o)
Hardboard										
Press	H-PVUV	65,275	(Msf 1/8-in/yr)	(3)	587	(Msf 1/8-in/day)	(3)	105,000	(Msf 1/8-in/yr)	(3)
Refiner	H-RF12	20,556	(ODT/yr)	(p)	183	(ODT/day)	(q)	35,964	(ODT/yr)	(r)
Forming Line	FORMER	20,556	(ODT/yr)	(p)	183	(ODT/day)	(q)	35,964	(ODT/yr)	(r)
Fuel Dryer	H-DRY	2,424	(ODT/yr)	(s)	95.0	(ODT/day)	(u)	8,554	(ODT/yr)	(v)
Material Balance										
Paintline - Basecoat 631-W020-1601	Misc-VOC_PL_BASE	249	(gal/yr)	(3)	2.00	(gal/day)	(w)	385	(gal/yr)	(17)
Paintline - High Gloss Topcoat (621-C020-232)	Misc-VOC_PL_TOP	50.0	(gal/yr)	(3)	1.00	(gal/day)	(w)	78.0	(gal/yr)	(17)
Lumber Surface - Mycostat P51 Treating Solution	Misc-VOC_LSP-MB	28,200	(gal/yr)	(3)	250	(gal/day)	(x)	62,500	(gal/yr)	(20)
Lumber Surface - AntiBlu XP-64	Misc-VOC_LSP-MB	2,317	(gal/yr)	(3)	0	(gal/day)	(20)	0	(gal/yr)	(20)
Lumber Surface - AntiBlu IP-75	Misc-VOC_LSP-MB	145	(gal/yr)	(3)	0	(gal/day)	(20)	0	(gal/yr)	(20)
Lumber Surface - AntiBlu M6 Treating Solution	Misc-VOC_LSP-MB	0.0	(gal/yr)	(3)	500	(gal/day)	(x)	80,500	(gal/yr)	(22)
Hardboard Resin	RESIN	294,395	(gal/yr)	(3)	2,041	(gal/day)	(x)	473,560	(gal/yr)	(22)
Wastewater Treatment Plant										
Wastewater Processed	WWTP	61.9	(MMgal/yr)	(3)	0.34	(MMgal/day)	(3)	124	(MMgal/yr)	(y)
Hardboard-Based Wastewater	HBWW	50.0	(MMgal/yr)	(3)	0.21	(MMgal/day)	(3)	75.0	(MMgal/yr)	(y)
Boiler Scrubber Wastewater	SCR_HYDRO	11.0	(MMgal/yr)	(3)	0.43	(MMgal/day)	(3)	38.7	(MMgal/yr)	(y)
Chipper										
Material Processed	S-CYC	48,721	(ODT/yr)	(j)	340	(ODT/day)	(j)	63,720	(ODT/yr)	(j)
Welding										
LIN 11018-18E	WELD	200	(lb/yr)	(3)	2.00	(lb/day)	(w)	288	(lb/yr)	(24)
LIN 309L, 18 RED	WELD	10.0	(lb/yr)	(3)	1.00	(lb/day)	(w)	104	(lb/yr)	(24)
LIN 309L, 332BLUE	WELD	8.00	(lb/yr)	(3)	1.00	(lb/day)	(w)	19.0	(lb/yr)	(24)
LIN 6010, 18	WELD	10.0	(lb/yr)	(3)	1.00	(lb/day)	(w)	115	(lb/yr)	(24)
LIN 6010-18PLUS	WELD	50.0	(lb/yr)	(3)	1.00	(lb/day)	(w)	58.0	(lb/yr)	(24)
LIN 7018, 18E	WELD	900	(lb/yr)	(3)	5.00	(lb/day)	(w)	1,035	(lb/yr)	(24)
LIN 7018, 332E	WELD	250	(lb/yr)	(3)	2.00	(lb/day)	(w)	288	(lb/yr)	(24)
LIN 7018, 532E	WELD	100	(lb/yr)	(3)	1.00	(lb/day)	(w)	230	(lb/yr)	(24)
LIO 111K3M-H-045	WELD	33.0	(lb/yr)	(3)	1.00	(lb/day)	(w)	114	(lb/yr)	(24)
SEL 720-045-13	WELD	165	(lb/yr)	(3)	1.00	(lb/day)	(w)	228	(lb/yr)	(24)
WIR E7056-035	WELD	99.0	(lb/yr)	(3)	1.00	(lb/day)	(w)	190	(lb/yr)	(24)
WIR E7056-045	WELD	66.0	(lb/yr)	(3)	1.00	(lb/day)	(w)	76.0	(lb/yr)	(24)
Babbitt Pot Usage										
Babbitt Pot #1	BPOT	315	(lb/yr)	(24)	20.00	(lb/day)	(24)	480	(lb/yr)	(24)
Babbitt Pot #2	BPOT	390	(lb/yr)	(24)	10.00	(lb/day)	(24)	520	(lb/yr)	(24)

Notes:

(a) Requested PTE daily (MMBtu/day) = (maximum combined hourly steam output [Mlb-steam/hr]) x (maximum potential daily hours of operation [hrs/day])
Maximum combined hourly steam output (Mlbs-steam/hr) = 86.1 (2)
Maximum potential daily hours of operation (hr/day) = 24.0 (3)

(b) Wood fuel usage (MMBtu) = (steam production [Mlb-steam]) x (fuel heat input to steam output ratio [MMBtu/Mlbs-steam])
Fuel heat input to steam output ratio = 2.06 (4)

(c) 2019 Total boiler throughput controlled by dry ESP (MMBtu/yr) = (combined boiler throughput [MMBtu/yr]) x (percentage of throughout controlled by ESP [%]/100)
Percentage of combined boiler throughput controlled by ESP (%) = 98.8 (5)

(d) PTE Total boiler throughput controlled by dry ESP (MMBtu/day) = (combined boiler throughput [MMBtu/day]) x (percentage of throughout controlled by ESP [%]/100)
Percentage of combined boiler throughput controlled by ESP (%) = 75.3 (6)

(e) PTE Total boiler throughput controlled by dry ESP (MMBtu/yr) = (combined boiler throughput [MMBtu/yr]) x (percentage of throughout controlled by ESP [%]/100)
Percentage of combined boiler throughput controlled by ESP (%) = 94.3 (7)

(f) 2019 Total boiler throughput controlled by scrubber (MMBtu/yr) = (combined boiler throughput [MMBtu/yr]) x (percentage of throughout controlled by ESP [%]/100)
Percentage of combined boiler throughput controlled by scrubber (%) = 1.17 (8)

(g) PTE Total boiler throughput controlled by scrubber (MMBtu/day) = (combined boiler throughput [MMBtu/day]) x (percentage of throughout controlled by scrubber [%]/100)
Percentage of combined boiler throughput controlled by ESP (%) = 24.7 (9)

(h) PTE Total boiler throughput controlled by dry ESP (MMBtu/yr) = (combined boiler throughput [MMBtu/yr]) x (percentage of throughout controlled by ESP [%]/100)
Percentage of combined boiler throughput controlled by scrubber (%) = 5.75 (10)

(i) Requested PTE daily kiln throughput (Mbdft/day) = (PTE hourly total kiln throughput [Mbdt/hr]) x (maximum potential daily hours of operation [hr/day])
PTE hourly total kiln throughput (Mbdt/hr) = 40.0 (3)
Maximum potential daily hours of operation (hr/day) = 24.0

(j) 2019 Kiln throughput (Douglas fir) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (2019 percentage of Douglas fir throughput [%]/100)
2019 percentage of Douglas fir throughput (%) = 81.2 (12)

(k) Kiln throughput (Douglas fir) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (average annual percentage of Douglas fir throughput [%]/100)
Average annual percentage of Douglas fir throughput (%) = 81.2 (12)

(l) 2019 Kiln throughput (hemlock) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (2019 percentage of hemlock throughput [%]/100)
2019 percentage of hemlock throughput (%) = 17.0 (12)

(m) Kiln throughput (hemlock) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (average annual percentage of hemlock throughput [%]/100)
Average annual percentage of hemlock throughput (%) = 16.9 (12)

(n) 2019 Kiln throughput (True fir) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (2019 percentage of true fir throughput [%]/100)
2019 percentage of True fir throughput (%) = 1.88 (12)

(o) Kiln throughput (True fir) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (average annual percentage of true fir throughput [%]/100)
Average annual percentage of True fir throughput (%) = 1.88 (12)

(p) 2019 annual throughput (ODT/yr) = (2019 annual hours of operation [hrs/yr]) x (weighted-average hourly throughput [ODT/hr])
2019 annual hours of operation (hrs/yr) = 3,409 (3)
Weighted-average hourly throughput (ODT/hr)= 6.03 (13)

(q) Requested PTE daily (units/day) = (PTE hourly throughput [ODT/hr]) x (maximum daily hours of operation [hrs/day])
PTE hourly throughput (ODT/hr)= 7.64 (14)
Maximum daily hours of operation (hrs/day) = 24.0 (3)

(r) PTE annual throughput (ODT/yr) = (Proposed PTE annual hours of operation [hrs/yr]) x (average hourly throughput [ODT/hr])
PTE annual hours of operation (hrs/yr) = 5,550 (3)
Average hourly throughput (ODT/hr)= 6.48 (15)

(s) 2019 fuel dryer annual throughput (ODT/yr) = (2019 annual hours of operation [hrs/yr]) x (fuel dryer hourly throughput [ODT/hr])
2019 annual hours of operation (hrs/yr) = 612 (3)
Fuel dryer hourly throughput (ODT/hr)= 3.96 (t)

(t) Fuel dryer hourly throughput (ODT/hr) = (fuel dryer hourly capacity [green units/hr]) x (2,400 lb/unit) / (2,000 lb/ton) x (1 - (fuel inlet moisture content [%] / 100)
Fuel dryer hourly capacity (green units/hr)= 6.00 (3)
Fuel inlet moisture content (%) = 45 (3)

(u) Requested fuel dryer PTE daily (ODT/day) = (fuel dryer hourly throughput [ODT/hr]) x (maximum daily hours of operation [hrs/day])
Maximum daily hours of operation (hrs/day) = 24.0 (3)
Fuel dryer hourly throughput (ODT/hr)= 3.96 (t)

(v) PTE fuel dryer annual throughput (ODT/yr) = (PTE annual hours of operation [hrs/yr]) x (fuel dryer hourly throughput [ODT/hr])
PTE annual hours of operation (hrs/yr) = 2,160 (3)
Fuel dryer hourly throughput (ODT/hr)= 3.96 (t)

(w) Requested PTE daily usage (gal/day) = (requested PTE annual usage [gal/yr]) / (annual days of operation [day/yr])
Annual days of operation (day/yr) = 232 (16)

(x) Requested PTE daily (gal/day) = (maximum monthly PTE [gal/month]) / (minimum days of operation per month [day/month])
Maximum monthly PTE (gal/month) = 275 (18)
Minimum days of operation per month (day/month) = 28.0 (3)

(y) PTE annual wastewater processed (Mgal/yr) = (PTE daily wastewater processed [Mgal/day]) x (days per year of WWTP operation)
Days per year of WWTP operation (days) = 365 (19)

(z) 2019 annual flow (Mgal/yr) = (2019 average wastewater flow [gpm]) X (1,440 [min/day]) x (2019 annual days of operation [days/yr]) / (1,000,000 gal/Mgal)
2019 average wastewater flow (gpm) = 298.8 (3)
2019 Annual days of operation (day/yr) = 25.5 (22)

({) PTE daily flow (Mgal/day) = (2019 average wastewater flow [gpm]) X (1,440 [min/day]) x (1,000,000 gal/Mgal)
2019 average wastewater flow (gpm) = 298.8 (3)

(|) PTE annual flow (Mgal/yr) = (2019 average wastewater flow [gpm]) X (1,440 [min/day]) x (PTE annual days of operation [days/yr]) / (1,000,000 gal/Mgal)
2019 average wastewater flow (gpm) = 298.8 (3)
PTE Annual days of operation (day/yr) = 90 (22)

(}) Chipper material processed (ODT/"period") = (kiln throughput [Mbdft/"period"]) x (chipper conversion factor [ODT chips/Mbdft]) x (percentage of green chips [%] /100)
Chipper conversion factor (ODT chips/Mbdft) = 0.413 (22)
Percentage of green chips (%) = 85.7 (22)

References:

(1) Information provided by Stimson Lumber Company.
(2) Stimson Lumber Company - Title V Permit 34-2066 2021 Title V Permit Renewal PSEL spreadsheet provided by DEQ. Representative of maximum hourly steam production for all three boilers between annual source tests.
(3) Information provided by Stimson Lumber Company.
(4) Representative of maximum average fuel heat input to steam output ratio (FHISOR) based on most recent set of source test data.
(5) Information provided by Stimson Lumber Company. Represents the total annual cumulative percentage of exhaust that was routed through the ESP during the 2019 calendar year. Boiler exhaust is exclusively routed through the ESP during periods when the dryer was not in operation (92.7% of the year), and approximately 75.3% of the time when the dryer was operational.
(6) Information provided by Stimson Lumber Company. Represents the total percentage of boiler exhaust that is controlled by the ESP during periods when the fuel dryer is operating. Value averaged between 2015 to 2020.
(7) Information provided by Stimson Lumber Company. Represents the total annual cumulative percentage of exhaust that is routed through the ESP on average throughout the year. Boiler exhaust is exclusively routed through the ESP during periods when the dryer is not in operation (74.2% per year on average), and 75.3% of the time when the dryer is operational.
(8) Information provided by Stimson Lumber Company. Represents the total annual cumulative percentage of exhaust that is routed through the wet scrubber on average throughout the year. The dryer operates approximately 7.3% of the time during facilty operating hours throughout the year and approximately 24.7% of the exhaust is routed through the scrubber on average when the dryer is operational.
(9) Information provided by Stimson Lumber Company. Represents the total percentage of boiler exhaust that is controlled by the wet scrubber during periods when the fuel dryer is operating. Value averaged between 2015 to 2020.
(10) Information provided by Stimson Lumber Company. Represents the total annual cumulative percentage of exhaust that is routed through the wet scrubber on average throughout the year. The dryer operates approximately 25.8% of the time during facilty operating hours throughout the year and approximately 24.7% of the exhaust is routed through the scrubber on average when the dryer is operational.
(11) Assumes maximum daily throughput of wood species is equal to overall maximum daily throughput.
(12) Information provided by Stimson Lumber Company. Represents the distribution of species for the 2019 calendar year. The 2019 calendar year is assumed to be representative of typical annual speciation each year.
(13) Hourly production rate for refiner and forming line based on weighted average of size of hardboard products manufacured at the facility between 2019 and 2022.
(14) PTE hourly production rate for the refiner and forming line based on 1/4-inch tempered hardboard production. 1/4-inch hardboard represents the largest size hardboard, and thus heaviest, that will be manufactured at the facility.
(15) Average hourly throughput rate is based on review of historical throughput rates of each size hardboard manufactured at the facility and forecasted future product rates.
(16) Representative of requested PTE annual operating time of hardboard plant.
(17) PTE usage determined by applying ratio of 2019 and PTE hardboard production rates to 2019 usage.
(18) Conservatively assumes maximum product usage for a month regardless of total days in month.
(19) Information provided by Stimson Lumber Company. Assumes maximum annual capacity of wastewater treatment plant.
(20) PTE usage determined by applying ratio of 2019 and PTE kiln production rates to 2019 usage.
(21) Assumes annual runtime of fuel dryer.
(22) Chipper conversion factor estimated chip sales and sawmill production at the Stimson Lumber Company Clatskanie facility. Dry material chipping is not expected to emit TACS so only green material chipping is included in the chipper throughput.
(23) PTE usage determined by taking highest annual purchase quanity between 2019 and 2021 and adding 15%.
(24) Information provided by Stimson Lumber Company. Based on engineering judgement.

Table 2
Miscellaneous Input Assumptions and Parameters
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Source	Source ID	Process Units								
		2019 Actual Production			Requested PTE Daily			Requested PTE Year		
Emergency Engines										
Backup Generator Engine Operating Hours	BGEN	15.9	(hrs/yr)	(1)	2.00	(hrs/day)	(1)	100	(hrs/yr)	(1)
Backup Generator Engine Fuel Consumption	BGEN	0.65	(Mgal/yr)	(a)	81.7	(gal/day)	(b)	4.08	(Mgal/yr)	(a)
Fire Pump Operating Hours	FIRE	28.5	(hrs/yr)	(1)	2.00	(hrs/day)	(1)	100	(hrs/yr)	(1)
Fire Pump Fuel Consumption	FIRE	0.21	(Mgal/yr)	(c)	14.41	(gal/day)	(d)	0.72	(Mgal/yr)	(c)

Notes:

(a) Annual backup generator engine fuel consumption (Mgal/yr) = (backup generator engine size [hp]) x (brake-specific fuel consumption [Btu/hp-hr]) / (1,000,000 Btu/MMBtu) / (diesel fuel heat content [MMBtu/gal]) / (1,000 gal/Mgal) x (annual operating hours [hrs/yr])

Backup generator engine size (hp) =	805	(1)
Brake-specific fuel consumption (Btu/hp-hr) =	7,000	(2)
Diesel fuel heat content (MMBtu/gal) =	0.138	(3)

(b) Daily backup generator engine fuel consumption (gal/day) = (backup generator engine size [hp]) x (brake-specific fuel consumption [Btu/hp-hr]) / (1,000,000 Btu/MMBtu) / (diesel fuel heat content [MMBtu/gal]) x (daily operating hours [hrs/day])

(c) Annual fire pump engine fuel consumption (Mgal/yr) = (fire pump engine size [hp]) x (brake-specific fuel consumption [Btu/hp-hr]) / (1,000,000 Btu/MMBtu) / (diesel fuel heat content [MMBtu/gal]) / (1,000 gal/Mgal) x (annual operating hours [hrs/yr])

Fire pump engine size (hp) =	142	(1)
Brake-specific fuel consumption (Btu/hp-hr) =	7,000	(2)
Diesel fuel heat content (MMBtu/gal) =	0.138	(3)

(d) Daily fire pump engine fuel consumption (gal/day) = (fire pump engine size [hp]) x (brake-specific fuel consumption [Btu/hp-hr]) / (1,000,000 Btu/MMBtu) / (diesel fuel heat content [MMBtu/gal]) x (daily operating hours [hrs/day])

References:

(1) Information provided by Stimson Lumber Company.

(2) Brake-specific fuel consumption from footnote a in AP-42 Chapter 3.3 (October 1996), Table 3.3-1.

(3) Diesel heat content from 40 CFR Part 98, Table C-1 High Heat Values for Various Types of Fuel.

Table 3
Storage Tank Input Assumptions and Parameters
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Tank ID	Tank Location [1]	Stored Solution [1]	Tank Heated? [1] (Yes/No)	Tank Temp. [2] (°F)	Tank Information [1]					Emissions Controlled or Fugitive? [1]	Tank Dimensions [1]			Maximum Liquid Height [a] (ft)	Tank Working Volume (gal)	Tank Throughput			
					Type?	Orientation? (Vertical/ Horizontal)	Paint Shade/ Condition?	Tank Condition?	PRV? (Yes/No)		Diameter (ft)	Length (ft)	Height (ft)			2019 Actual		Requested PTE	
																Maximum Daily [3] (gal/day)	Annual (gal/yr)	Maximum Daily [3] (gal/day)	Annual (gal/yr)
D1	Near Wood Shop	No. 2 Diesel	No	59.1	Fixed-Roof	Horizontal	Aluminum-Diffuse	Average	No	Fugitive	9.00	25.9	--	7.07	7,604 [b]	7,604	88,505 [1]	7,604	116,000 [c]
G1	East of Hardboard Plant	Unleaded Gasoline	No	59.1	Fixed-Roof	Horizontal	Aluminum-Diffuse	Average	No	Fugitive	6.90	21.0	--	5.42	3,624 [b]	3,624	9,100 [1]	3,624	15,000 [d]
D2	East of Hardboard Plant	No. 2 Diesel	No	59.1	Fixed-Roof	Horizontal	Aluminum-Diffuse	Average	No	Fugitive	8.00	25.5	--	6.28	5,915 [b]	5,915	54,277 [1]	5,915	87,000 [d]
R1	Hardboard Plant	Resin	No	59.1	Fixed-Roof	Vertical	Aluminum-Diffuse	Average	No	Fugitive	6.80	--	17.3	16.3	4,763 [1]	4,763	98,132 [e]	4,763	157,853 [e]
R2	Hardboard Plant	Resin	No	59.1	Fixed-Roof	Vertical	Aluminum-Diffuse	Average	No	Fugitive	8.10	--	13.6	12.6	5,195 [1]	5,195	98,132 [e]	5,195	157,853 [e]
R3	Hardboard Plant	Resin	No	59.1	Fixed-Roof	Vertical	Aluminum-Diffuse	Average	No	Fugitive	8.10	--	13.7	12.7	5,223 [1]	5,223	98,132 [e]	5,223	157,853 [e]

NOTES:

PRV = pressure relief valve; PTE = potential to emit.

(a) Maximum liquid height (gal) = (π/4) x (tank diameter); See reference (3).

(b) Tank working volume (gal) = (π/4) x (maximum liquid height [ft])^2 x (tank length [ft]) x (7.481 gal/ft^3)

(c) Annual requested PTE (gal/yr) = (2019 actual throughput [gal/yr]) x (ratio of sawmill throughput for 2019 and PTE)

Ratio of sawmill throughput for 2019 and PTE = 1.31 (5)

(d) Annual requested PTE (gal/yr) = (2019 actual throughput [gal/yr]) x (ratio of hardboard plant throughput for 2019 and PTE)

Ratio of hardboard plant throughput for 2019 and PTE = 1.61 (5)

(e) Resin tank throughput (gal/yr) = (total resin throughput [gal/yr]) / (number of resin tanks)

Number of resin tanks = 3.00 (1)

REFERENCES:

(1) Information provided by Stimson Lumber Company.

(2) Tanks are not heated and liquid temperature is derived from the ambient air temperature. Additional information is found in Table 29, Gasoline Storage Tank (G1) TAC Emission Estimates.

(3) AP-42 Chapter 7 (June 2020); see equation 1-36 notes. For vertical tanks, value is set to one minus the tank shell height. For horizontal tanks, value is set to (π/4)D_E.

(4) Assumes the maximum daily tank throughput is equal to filling the tank from empty.

(5) See Table 1, Input Process Rates and Parameters.

Table 4
Storage Tank Solution Compositions
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	Regulatory Category (Yes/No)			Diesel Composition				Gasoline Composition				Resin Composition	
		TAC	HAP	RBC	Conc. [1] (mg/L)	Mass [a] (lb/gal)	Weight Fraction [b]	Weight Percent [d] (%)	Conc. [1] (mg/L)	Mass [a] (lb/gal)	Weight Fraction [b]	Weight Percent [d] (%)	Weight Fraction [4]	Weight Percent [4] (%)
AROMATICS														
Benzene	71-43-2	Yes	Yes	Yes	67.0	5.6E-04	7.9E-05	7.9E-03	6,140	0.051	8.7E-03	0.87	--	--
Toluene	108-88-3	Yes	Yes	Yes	238	2.0E-03	2.8E-04	0.028	15,400	0.13	0.022	2.17	--	--
Ethylbenzene	100-41-4	Yes	Yes	Yes	124	1.0E-03	1.5E-04	0.015	3,080	0.026	4.3E-03	0.43	--	--
p-Xylene, m-xylene	106-42-3	Yes	Yes	Yes	420	3.5E-03	4.9E-04	0.049	9,120	0.076	0.013	1.29	--	--
o-Xylene	95-47-6	Yes	Yes	Yes	185	1.5E-03	2.2E-04	0.022	4,610	0.038	6.5E-03	0.65	--	--
Isopropylbenzene (Cumene	98-82-8	Yes	Yes	Yes	44.0	3.7E-04	5.2E-05	5.2E-03	351	2.9E-03	4.9E-04	0.049	--	--
n-Propylbenzene	103-65-1	No	No	No	115	9.6E-04	1.4E-04	0.014	2,110	0.018	3.0E-03	0.30	--	--
p-Isopropyltoluene	99-87-6	No	No	No	112	9.3E-04	1.3E-04	0.013	88.0	7.3E-04	1.2E-04	0.012	--	--
4-Ethyltoluene	622-96-8	No	No	No	400	3.3E-03	4.7E-04	0.047	8,380	0.070	0.012	1.18	--	--
2-Ethyltoluene	611-14-3	No	No	No	194	1.6E-03	2.3E-04	0.023	3,460	0.029	4.9E-03	0.49	--	--
1,3,5-Trimethylbenzene	108-67-8	Yes	No	Yes	202	1.7E-03	2.4E-04	0.024	4,060	0.034	5.7E-03	0.57	--	--
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	720	6.0E-03	8.5E-04	0.085	10,600	0.088	0.015	1.49	--	--
1,2,3-Trimethylbenzene	526-73-8	Yes	No	Yes	2,120	0.018	2.5E-03	0.25	3,950	0.033	5.6E-03	0.56	--	--
sec-Butylbenzene	135-98-8	No	No	No	90.0	7.5E-04	1.1E-04	0.011	159	1.3E-03	2.2E-04	0.022	--	--
n-Butylbenzene	104-51-8	No	No	No	375	3.1E-03	4.4E-04	0.044	822	6.9E-03	1.2E-03	0.12	--	--
Styrene	100-42-5	Yes	Yes	Yes	0.020	1.7E-07	2.4E-08	2.4E-06	14.0	1.2E-04	2.0E-05	2.0E-03	--	--
Naphthalene	91-20-3	Yes	Yes	Yes	3,000	0.025	3.5E-03	0.35	2,240	0.019	3.2E-03	0.32	--	--
ALKANES														
n-Heptane	142-82-5	No	No	No	174	1.5E-03	2.0E-04	0.020	12,800	0.11	0.018	1.80	--	--
n-Octane	111-65-9	No	No	No	481	4.0E-03	5.7E-04	0.057	2,870	0.024	4.0E-03	0.40	--	--
n-Nonane	111-84-2	No	No	No	7,020	0.059	8.3E-03	0.83	1,790	0.015	2.5E-03	0.25	--	--
n-Decane	124-18-5	No	No	No	7,690	0.064	9.1E-03	0.91	1,390	0.012	2.0E-03	0.20	--	--
n-Undecane	1120-21-4	No	No	No	7,730	0.065	9.1E-03	0.91	1,120	9.3E-03	1.6E-03	0.16	--	--
n-Dodecane	112-40-3	No	No	No	8,370	0.070	9.9E-03	0.99	822	6.9E-03	1.2E-03	0.12	--	--
n-Tridecane	629-50-5	No	No	No	13,400	0.11	0.016	1.58	644	5.4E-03	9.1E-04	0.091	--	--
n-Tetradecane	629-59-4	No	No	No	10,100	0.084	0.012	1.19	213	1.8E-03	3.0E-04	0.030	--	--
n-Pentadecane	629-62-9	No	No	No	9,030	0.075	0.011	1.06	62.0	5.2E-04	8.7E-05	8.7E-03	--	--
n-Hexadecane	544-76-3	No	No	No	9,300	0.078	0.011	1.10	18.0	1.5E-04	2.5E-05	2.5E-03	--	--
Cyclohexane	110-82-7	Yes	No	Yes	191	1.6E-03	2.2E-04	0.022	9,830	0.082	0.014	1.39	--	--
Methyl cyclohexane	108-87-2	No	No	No	426	3.6E-03	5.0E-04	0.050	8,280	0.069	0.012	1.17	--	--
Resin														
Phenol	108-95-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	1.0E-03	0.10
Formaldehyde	50-00-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	1.0E-03	0.10
Total Composition					**82,318**	**0.69**	**0.097**	**9.69**	**114,423**	**0.95**	**0.16**	**16.1**	**2.0E-03**	**0.20**

NOTES:

HAP = hazardous air pollutant; lb/gal = pounds per gallon; mg/L = milligrams per liter; RBC = risk-based concentration; TAC = toxic air contaminant.

(a) Mass (lb/gal) = (concentration [mg/L]) x (g/1,000 mg) x (3.785 L/gal) x (lb/453.592 g)

(b) Weight fraction = (component mass [lb/gal]) / (diesel or gasoline density at 60°F [lb/gal])

Diesel density at 60°F (lb/gal) = 7.09 (c)

Gasoline density at 60°F (lb/gal) = 5.92 (c)

(c) Density at 60°F (lb/gal) = (specific gravity of diesel or gasoline) x (density of water at 60°F [lb/gal])

Specific gravity of diesel = 0.85 (2)

Specific gravity of gasoline = 0.71 (3)

Density of water at 60°F (lb/gal) = 8.3369

(d) Weight percent (%) = (weight fraction) x (100%)

REFERENCES:

(1) Chin J.Y., Batterman S.A. VOC composition of current motor vehicle fuels and vapors, and collinearity analyses for receptor modeling. Chemosphere. 2012;86:951–958. doi: 10.1016/j.chemosphere.2011.11.017. See Table 1.

(2) Diesel Fuels Technical Review document prepared by Chevron dated from 2007. See Chapter 2. Value represents the average of the range provided.

(3) https://www.fluidswitch.com/resources/specific-gravity/

(4) Information from safety data sheet of GP 276A30 Hardboard Adhesive (2019).

Table 5
Solubility Constants and Associated Control Efficiency Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Organic Compound	CAS	Regulatory Category (Yes/No)		Solubility [1] (mg/L)	Control Efficiency Estimate [2] (%)
		TAC	HAP		
Formaldehyde	50-00-0	No	Yes	400,000	85 [3]
Methanol	67-56-1	Yes	Yes	--	95 [3]
Acetaldehyde	75-07-0	Yes	Yes	100,000	21.0 [a]
Acetone	67-64-1	Yes	No	100,000	21.0 [a]
Acrolein	107-02-8	Yes	Yes	211,000	44.0 [a]
Methyl ethyl ketone	78-93-3	Yes	No	211,000	44.0 [a]
Methyl isobutyl ketone	108-10-1	Yes	Yes	19,000	4.0 [a]
Propionaldehyde	123-38-6	Yes	Yes	306,000	65.0 [a]
1,2,4-Trimethyl benzene	95-63-6	Yes	No	57.0	0 [a]
Acetophenone	98-86-2	Yes	Yes	6,130	1.0 [a]
Benzene	71-43-2	Yes	Yes	1,790	0 [a]
Bromomethane (Methyl bromide)	74-83-9	Yes	Yes	15,200	3.0 [a]
Chloromethane (Methyl chloride)	74-87-3	Yes	Yes	5,040	1.0 [a]
Crotonaldehyde	4170-30-3	Yes	No	156,000	33.0 [a]
Cumene	98-82-8	Yes	Yes	61.3	0 [a]
Methylene chloride	75-09-2	Yes	Yes	13,200	2.0 [a]
Naphthalene	91-20-3	Yes	Yes	31.0	0 [a]
Phenol	108-95-2	Yes	Yes	82,800	17.0 [a]
Toluene	108-88-3	Yes	Yes	526	0 [a]
Vinyl acetate	108-05-4	Yes	Yes	20,000	4.0 [a]
m-Xylene	108-38-3	Yes	Yes	160	0 [a]
p-Xylene	106-42-3	Yes	Yes	165	0 [a]
o-Xylene	95-47-6	Yes	Yes	180	0 [a]
Styrene	100-42-5	Yes	Yes	300	0 [a]

NOTES:

HAP = hazardous air pollutant.

mg/L = milligrams per liter.

RBC = risk-based concentration.

TAC = toxic air contaminant.

(a) Control efficiency estimate (%) = (solubility of compound [mg/L]) / (solubility of formaldehyde [mg/L]) x (formaldehyde control efficiency [%])

REFERENCES:

(1) Truncated to nearest whole number. Calculated control efficiencies less than one assumed zero.

(2) Solubility obtained from PubChem Compound Summary [accessed October 18, 2022]. Some values converted from mg/mL to mg/L.

(3) Control efficiency of formaldehyde and methanol from Source Test Evaluation Report of Scrubber 5 (2010) by Horizon Engineering.

Table 6
Boilers (Hog Fuel) ESP Control - TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/MMBtu)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Metals								
Antimony	7440-36-0	Yes	32	3.06E-07 [2]	9.81E-04	0.18	9.81E-04	0.28
Arsenic	7440-38-2	Yes	35	1.89E-06 [2]	6.06E-03	1.10	6.06E-03	1.74
Barium	7440-39-3	No	43	2.09E-04 [2]	0.67	122	0.67	193
Beryllium	7440-41-7	Yes	52	2.85E-08 [2]	9.14E-05	0.017	9.14E-05	0.026
Cadmium	7440-43-9	Yes	77	3.24E-07 [2]	1.04E-03	0.19	1.04E-03	0.30
Chromium VI	18540-29-9	Yes	119	2.72E-07 [2]	8.72E-04	0.16	8.72E-04	0.25
Cobalt	7440-48-4	Yes	123	4.97E-07 [2]	1.59E-03	0.29	1.59E-03	0.46
Copper and compounds	7440-50-8	No	125	3.79E-06 [2]	0.012	2.21	0.012	3.50
Lead	7439-92-1	Yes	278	5.21E-06 [2]	0.017	3.04	0.017	4.80
Manganese	7439-96-5	Yes	281	9.57E-05 [2]	0.31	55.9	0.31	88.3
Mercury	7439-97-6	Yes	284	8.80E-07 [3]	2.82E-03	0.51	2.82E-03	0.81
Molybdenum trioxide	1313-27-5	No	317	3.11E-06 [2]	9.95E-03	1.81	9.95E-03	2.86
Nickel	7440-02-0	Yes	321	2.80E-06 [2]	8.98E-03	1.63	8.98E-03	2.58
Selenium	7782-49-2	Yes	528	1.62E-06 [2]	5.19E-03	0.95	5.19E-03	1.49
Silver	7440-22-4	No	531	9.85E-07 [4]	3.16E-03	0.57	3.16E-03	0.91
Vanadium (fume or dust)	7440-62-2	No	594	5.94E-07 [2]	1.90E-03	0.35	1.90E-03	0.55
Zinc	7440-66-6	No	606	5.76E-05 [2]	0.18	33.6	0.18	53.1
Organic Compounds								
1,2-Dichloropropane	78-87-5	Yes	173	1.68E-05 [5]	0.054	9.81	0.054	15.5
Acetaldehyde	75-07-0	Yes	1	2.83E-04 [5]	0.91	165	0.91	261
Acetone	67-64-1	No	3	5.29E-04 [5]	1.70	309	1.70	488
Acetophenone	98-86-2	Yes	5	1.84E-06 [5]	5.90E-03	1.07	5.90E-03	1.70
Acrolein	107-02-8	Yes	6	2.60E-04 [5]	0.83	152	0.83	240
Benzene	71-43-2	Yes	44	9.80E-04 [5]	3.14	572	3.14	904
Carbon tetrachloride	56-23-5	Yes	84	9.87E-06 [5]	0.032	5.76	0.032	9.10
Chlorine	7782-50-5	Yes	96	7.90E-04 [6]	2.53	461	2.53	729
Chlorobenzene	108-90-7	Yes	102	1.66E-05 [5]	0.053	9.69	0.053	15.3
Chloroform	67-66-3	Yes	107	2.01E-05 [5]	0.064	11.7	0.064	18.5
Crotonaldehyde	4170-30-3	No	132	4.48E-05 [5]	0.14	26.1	0.14	41.3
Dibutyl phthalate	84-74-2	Yes	161	3.33E-05 [5]	0.11	19.4	0.11	30.7
Diethylphthalate	84-66-2	No	186	4.36E-05 [5]	0.14	25.4	0.14	40.2
Ethyl benzene	100-41-4	Yes	221	1.22E-05 [5]	0.039	7.12	0.039	11.3
Formaldehyde	50-00-0	Yes	240	1.05E-03 [5]	3.37	613	3.37	968
Hexane	110-54-3	Yes	262	2.88E-04 [5]	0.92	168	0.92	266
Isopropyl alcohol	67-63-0	No	274	4.52E-03 [5]	14.5	2,638	14.5	4,169
Methanol	67-56-1	Yes	288	7.32E-04 [5]	2.35	427	2.35	675
Methyl bromide	74-83-9	Yes	64	1.13E-05 [5]	0.036	6.60	0.036	10.4
Methyl chloride	74-87-3	Yes	108	4.35E-05 [5]	0.14	25.4	0.14	40.1
Methyl chloroform	71-55-6	Yes	572	5.78E-05 [5]	0.19	33.7	0.19	53.3
Methylene chloride	75-09-2	Yes	170	3.98E-04 [5]	1.28	232	1.28	367
Methyl isobutyl ketone	108-10-1	Yes	300	4.45E-04 [5]	1.43	260	1.43	410
Methyl ethyl ketone	78-93-3	No	68	6.97E-06 [5]	0.022	4.07	0.022	6.43
Phenol	108-95-2	Yes	383	1.60E-04 [5]	0.51	93.4	0.51	148
Phosphorus	7723-14-0	Yes	392	3.10E-04 [5]	0.99	181	0.99	286
Propionaldehyde	123-38-6	Yes	510	3.11E-04 [5]	1.00	182	1.00	287
Styrene	100-42-5	Yes	536	4.69E-04 [5]	1.50	274	1.50	433
Toluene	108-88-3	Yes	555	1.14E-05 [5]	0.037	6.65	0.037	10.5
Xylene (mixture)	1330-20-7	Yes	602	5.22E-06 [5]	0.017	3.05	0.017	4.81
Inorganic Compounds								
Hydrogen fluoride	7664-39-3	Yes	267	9.05E-05 [7]	0.29	52.8	0.29	83.5
Hydrochloric acid	7647-01-0	Yes	265	5.72E-05 [3]	0.18	33.4	0.18	52.8
PAHs								
Acenaphthene	83-32-9	Yes	458	8.53E-07 [5]	2.73E-03	0.50	2.73E-03	0.79
Acenaphthylene	208-96-8	Yes	459	4.69E-06 [5]	0.015	2.74	0.015	4.33
Anthracene	120-12-7	Yes	460	2.68E-06 [5]	8.59E-03	1.56	8.59E-03	2.47
Benz[a]anthracene	56-55-3	Yes	462	8.13E-08 [5]	2.61E-04	0.047	2.61E-04	0.075
Benzo[a]pyrene	50-32-8	Yes	463	2.22E-06 [5]	7.12E-03	1.30	7.12E-03	2.05
Benzo[b]fluoranthene	205-99-2	Yes	464	1.42E-07 [5]	4.55E-04	0.083	4.55E-04	0.13
Benzo[e]pyrene	192-97-2	Yes	466	2.11E-07 [5]	6.76E-04	0.12	6.76E-04	0.19
Benzo[g,h,i]perylene	191-24-2	Yes	467	1.51E-07 [5]	4.84E-04	0.088	4.84E-04	0.14
Benzo[j]fluoranthene	205-82-3	Yes	468	1.56E-07 [5]	5.00E-04	0.091	5.00E-04	0.14
Benzo[k]fluoranthene	207-08-9	Yes	469	5.18E-08 [5]	1.66E-04	0.030	1.66E-04	0.048
Chrysene	218-01-9	Yes	471	7.90E-08 [5]	2.53E-04	0.046	2.53E-04	0.073
Fluoranthene	206-44-0	Yes	482	1.67E-06 [5]	5.35E-03	0.97	5.35E-03	1.54
Fluorene	86-73-7	Yes	483	3.01E-06 [5]	9.65E-03	1.76	9.65E-03	2.78
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	484	1.02E-07 [5]	3.27E-04	0.060	3.27E-04	0.094
2-Methyl naphthalene	91-57-6	Yes	485	1.40E-06 [5]	4.49E-03	0.82	4.49E-03	1.29
Naphthalene	91-20-3	Yes	320	9.96E-05 [5]	0.32	58.1	0.32	91.9
Perylene	198-55-0	Yes	486	3.20E-08 [5]	1.03E-04	0.019	1.03E-04	0.030
Phenanthrene	85-01-8	Yes	487	6.46E-06 [5]	0.021	3.77	0.021	5.96
Pyrene	129-00-0	Yes	488	3.54E-06 [5]	0.011	2.07	0.011	3.26
Dioxans & Furans								
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	440	9.53E-13 [5]	3.05E-09	5.56E-07	3.05E-09	8.79E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	441	1.33E-12 [5]	4.26E-09	7.76E-07	4.26E-09	1.23E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	442	8.70E-13 [5]	2.79E-09	5.08E-07	2.79E-09	8.02E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	443	2.09E-12 [5]	6.70E-09	1.22E-06	6.70E-09	1.93E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	444	2.21E-12 [5]	7.08E-09	1.29E-06	7.08E-09	2.04E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	445	9.76E-12 [5]	3.13E-08	5.70E-06	3.13E-08	9.00E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	446	2.46E-11 [5]	7.89E-08	1.44E-05	7.89E-08	2.27E-05
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	447	8.04E-12 [5]	2.58E-08	4.69E-06	2.58E-08	7.41E-06
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	448	3.99E-12 [5]	1.28E-08	2.33E-06	1.28E-08	3.68E-06
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	449	6.09E-12 [5]	1.95E-08	3.55E-06	1.95E-08	5.62E-06
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	450	3.56E-12 [5]	1.14E-08	2.08E-06	1.14E-08	3.28E-06
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	451	3.16E-12 [5]	1.01E-08	1.84E-06	1.01E-08	2.91E-06
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	452	6.67E-13 [5]	2.14E-09	3.89E-07	2.14E-09	6.15E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	453	2.66E-12 [5]	8.53E-09	1.55E-06	8.53E-09	2.45E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	454	5.71E-12 [5]	1.83E-08	3.33E-06	1.83E-08	5.27E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	455	7.98E-13 [5]	2.56E-09	4.66E-07	2.56E-09	7.36E-07
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	456	5.00E-12 [5]	1.60E-08	2.92E-06	1.60E-08	4.61E-06
PCBs & Phthalates								
dichlorobiphenyla	--	--	--	7.35E-10 [5]	2.36E-06	4.29E-04	2.36E-06	6.78E-04
hexachlorobiphenyla	--	--	--	5.45E-10 [5]	1.75E-06	3.18E-04	1.75E-06	5.03E-04
pentachlorobiphenyla	--	--	--	1.20E-09 [5]	3.85E-06	7.00E-04	3.85E-06	1.11E-03
tetrachlorobiphenyla	--	--	--	2.50E-09 [5]	8.01E-06	1.46E-03	8.01E-06	2.31E-03
trichlorobiphenyla	--	--	--	2.61E-09 [5]	8.37E-06	1.52E-03	8.37E-06	2.41E-03
Total PCBs	1336-36-3	Yes	409	7.59E-09 [8]	2.43E-05	4.43E-03	2.43E-05	7.00E-03
Decachlorobiphenyl	2051-24-3	Yes	438	2.65E-10 [5]	8.49E-07	1.55E-04	8.49E-07	2.44E-04
1-Methylphenanthrene	832-69-9	No	307	2.59E-07 [5]	8.30E-04	0.15	8.30E-04	0.24
3-Methylcholanthrene	56-49-5	Yes	496	8.68E-09 [5]	2.78E-05	5.07E-03	2.78E-05	8.01E-03
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	493	4.57E-09 [5]	1.46E-05	2.67E-03	1.46E-05	4.21E-03
2,4-Dinitrotoluene	121-14-2	Yes	204	9.42E-07 [5]	3.02E-03	0.55	3.02E-03	0.87
4,6-Dinitro-o-cresol (and salts)	534-52-1	Yes	202	2.10E-06 [5]	6.73E-03	1.23	6.73E-03	1.94
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	59	4.65E-08 [5]	1.49E-04	0.027	1.49E-04	0.043
Butyl benzyl phthalate	85-68-7	No	74	2.68E-05 [5]	0.086	15.6	0.086	24.7
Hydrogen cyanide	74-90-8	No	135	2.05E-05 [5]	0.066	12.0	0.066	18.9
di-n-octylphthalateb	117-84-0	--	518	1.10E-07 [6]	3.53E-04	0.064	3.53E-04	0.10
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	224	2.92E-05 [5]	0.094	17.0	0.094	26.9
Isopropylbenzene (Cumene)	98-82-8	Yes	275	1.77E-05 [5]	0.057	10.3	0.057	16.3
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	164	2.79E-04 [5]	0.89	163	0.89	257
Vinyl Chloride	75-01-4	Yes	598	1.84E-05 [5]	0.059	10.7	0.059	17.0
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	574	1.99E-05 [5]	0.064	11.6	0.064	18.4
4-nitrophenol	100-02-7	Yes	350	1.14E-07 [5]	3.65E-04	0.067	3.65E-04	0.11
2-Chlorophenol	95-57-8	No	111	2.35E-08 [5]	7.53E-05	0.014	7.53E-05	0.022
2,4-Dinitrophenol	51-28-5	Yes	203	1.80E-07 [5]	5.77E-04	0.11	5.77E-04	0.17
Trichlorofluoromethane (Freon 11)	75-69-4	No	575	1.39E-05 [5]	0.045	8.11	0.045	12.8
2,4,6-Trichlorophenol	88-06-2	Yes	577	2.00E-07 [5]	6.41E-04	0.12	6.41E-04	0.18
Pentachlorophenol	87-86-5	Yes	371	2.14E-07 [5]	6.86E-04	0.12	6.86E-04	0.20
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	547	2.46E-05 [5]	0.079	14.4	0.079	22.7
Total TAC Emissions Estimate					**41.6**	**7,572**	**41.6**	**11,965**
Total HAP Emissions Estimate					**24.0**	**4,373**	**24.0**	**6,910**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (maximum daily heat input [MMBtu/day])
Maximum daily heat input (MMBtu/day) = 3,205 (1)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/MMBtu]) x (annual heat input [MMBtu/yr])
2019 annual heat input (MMBtu/yr) = 583,631 (1)
PTE annual heat input (MMBtu/yr) = 922,236 (1)

References:

(1) See Table 1, Input Process Rates and Parameters.
(2) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with ESP or fabric filter control.
(3) Boiler MACT compliance Source Test Report (2019). Representative of the 3-run average from the ESP outlet.
(4) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet scrubber control.
(5) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler.
(6) AP-42 Chapter 1 (March 2022), Table 1.6-3, "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion." Emission factors are for uncontrolled sources.
(7) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with dry control device.
(8) Equal to sum of speciated PCB compounds.

Table 7
Boilers (Hog Fuel) Wet Scrubber Control - TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/MMBtu)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Metals								
Antimony	7440-36-0	Yes	32	2.00E-06 [2]	2.1E-03	0.098	2.1E-03	0.11
Arsenic	7440-38-2	Yes	35	1.11E-05 [2]	0.012	0.55	0.012	0.62
Barium	7440-39-3	No	43	3.97E-04 [2]	0.42	19.5	0.42	22.3
Beryllium	7440-41-7	Yes	52	6.90E-08 [2]	7.3E-05	3.4E-03	7.3E-05	3.9E-03
Cadmium	7440-43-9	Yes	77	3.20E-06 [2]	3.4E-03	0.16	3.4E-03	0.18
Chromium VI	18540-29-9	Yes	119	2.35E-07 [2]	2.5E-04	0.012	2.5E-04	0.013
Cobalt	7440-48-4	Yes	123	1.95E-06 [2]	2.1E-03	0.096	2.1E-03	0.11
Copper and compounds	7440-50-8	No	125	1.82E-05 [2]	0.019	0.89	0.019	1.02
Lead	7439-92-1	Yes	278	3.00E-05 [2]	0.032	1.48	0.032	1.69
Manganese	7439-96-5	Yes	281	2.50E-04 [2]	0.26	12.3	0.26	14.1
Mercury	7439-97-6	Yes	284	1.10E-06 [3]	1.2E-03	0.054	1.2E-03	0.062
Molybdenum trioxide	1313-27-5	No	317	3.11E-06 [4]	3.3E-03	0.15	3.3E-03	0.17
Nickel	7440-02-0	Yes	321	7.34E-06 [2]	7.7E-03	0.36	7.7E-03	0.41
Selenium	7782-49-2	Yes	528	1.71E-06 [2]	1.8E-03	0.084	1.8E-03	0.096
Silver	7440-22-4	No	531	9.85E-07 [2]	1.0E-03	0.048	1.0E-03	0.055
Thallium and compounds	7440-28-0	No	550	1.85E-06 [2]	1.9E-03	0.091	1.9E-03	0.10
Vanadium (fume or dust)	7440-62-2	No	594	5.94E-07 [4]	6.2E-04	0.029	6.2E-04	0.033
Zinc	7440-66-6	No	606	2.33E-04 [2]	0.24	11.5	0.24	13.1
Organic Compounds								
1,2-Dichloropropane	78-87-5	Yes	173	1.68E-05 [5]	0.018	0.83	0.018	0.95
Acetaldehyde	75-07-0	Yes	1	2.83E-04 [5]	0.30	13.9	0.30	15.9
Acetone	67-64-1	No	3	5.29E-04 [5]	0.56	26.0	0.56	29.8
Acetophenone	98-86-2	Yes	5	1.84E-06 [5]	1.9E-03	0.090	1.9E-03	0.10
Acrolein	107-02-8	Yes	6	2.60E-04 [5]	0.27	12.8	0.27	14.6
Benzene	71-43-2	Yes	44	9.80E-04 [5]	1.03	48.2	1.03	55.1
Carbon tetrachloride	56-23-5	Yes	84	9.87E-06 [5]	0.010	0.49	0.010	0.56
Chlorine	7782-50-5	Yes	96	7.90E-04 [7]	0.83	38.8	0.83	44.4
Chlorobenzene	108-90-7	Yes	102	1.66E-05 [5]	0.017	0.82	0.017	0.93
Chloroform	67-66-3	Yes	107	2.01E-05 [5]	0.021	0.99	0.021	1.13
Crotonaldehyde	4170-30-3	No	132	4.48E-05 [5]	0.047	2.20	0.047	2.52
Dibutyl phthalate	84-74-2	Yes	161	3.33E-05 [5]	0.035	1.64	0.035	1.87
Diethylphthalate	84-66-2	No	186	4.36E-05 [5]	0.046	2.14	0.046	2.45
Ethyl benzene	100-41-4	Yes	221	1.22E-05 [5]	0.013	0.60	0.013	0.69
Formaldehyde	50-00-0	Yes	240	1.05E-03 [5]	1.10	51.6	1.10	59.1
Hexane	110-54-3	Yes	262	2.88E-04 [5]	0.30	14.2	0.30	16.2
Isopropyl alcohol	67-63-0	No	274	4.52E-03 [5]	4.75	222	4.75	254
Methanol	67-56-1	Yes	288	7.32E-04 [5]	0.77	36.0	0.77	41.2
Methyl bromide	74-83-9	Yes	64	1.13E-05 [5]	0.012	0.56	0.012	0.64
Methyl chloride	74-87-3	Yes	108	4.35E-05 [5]	0.046	2.14	0.046	2.45
Methyl chloroform	71-55-6	Yes	572	5.78E-05 [5]	0.061	2.84	0.061	3.25
Methylene chloride	75-09-2	Yes	170	3.98E-04 [5]	0.42	19.6	0.42	22.4
Methyl isobutyl ketone	108-10-1	Yes	300	4.45E-04 [5]	0.47	21.9	0.47	25.0
Methyl ethyl ketone	78-93-3	No	68	6.97E-06 [5]	7.3E-03	0.34	7.3E-03	0.39
Phenol	108-95-2	Yes	383	1.60E-04 [5]	0.17	7.87	0.17	9.00
Phosphorus	7723-14-0	Yes	392	3.10E-04 [5]	0.33	15.2	0.33	17.4
Propionaldehyde	123-38-6	Yes	510	3.11E-04 [5]	0.33	15.3	0.33	17.5
Styrene	100-42-5	Yes	536	4.69E-04 [5]	0.49	23.1	0.49	26.4
Toluene	108-88-3	Yes	555	1.14E-05 [5]	0.012	0.56	0.012	0.64
Xylene (mixture)	1330-20-7	Yes	602	5.22E-06 [5]	5.5E-03	0.26	5.5E-03	0.29
Inorganic Compounds								
Hydrogen fluoride	7664-39-3	Yes	267	2.54E-05 [6]	0.027	1.25	0.027	1.43
Hydrochloric acid	7647-01-0	Yes	265	1.36E-04 [3]	0.14	6.69	0.14	7.65
PAHs								
Acenaphthene	83-32-9	Yes	458	8.53E-07 [5]	9.0E-04	0.042	9.0E-04	0.048
Acenaphthylene	208-96-8	Yes	459	4.69E-06 [5]	4.9E-03	0.23	4.9E-03	0.26
Anthracene	120-12-7	Yes	460	2.68E-06 [5]	2.8E-03	0.13	2.8E-03	0.15
Benz[a]anthracene	56-55-3	Yes	462	8.13E-08 [5]	8.5E-05	4.0E-03	8.5E-05	4.6E-03
Benzo[a]pyrene	50-32-8	Yes	463	2.22E-06 [5]	2.3E-03	0.11	2.3E-03	0.12
Benzo[b]fluoranthene	205-99-2	Yes	464	1.42E-07 [5]	1.5E-04	7.0E-03	1.5E-04	8.0E-03
Benzo[e]pyrene	192-97-2	Yes	466	2.11E-07 [5]	2.2E-04	0.010	2.2E-04	0.012
Benzo[g,h,i]perylene	191-24-2	Yes	467	1.51E-07 [5]	1.6E-04	7.4E-03	1.6E-04	8.5E-03
Benzo[j]fluoranthene	205-82-3	Yes	468	1.56E-07 [5]	1.6E-04	7.7E-03	1.6E-04	8.8E-03
Benzo[k]fluoranthene	207-08-9	Yes	469	5.18E-08 [5]	5.4E-05	2.5E-03	5.4E-05	2.9E-03
Chrysene	218-01-9	Yes	471	7.90E-08 [5]	8.3E-05	3.9E-03	8.3E-05	4.4E-03
Fluoranthene	206-44-0	Yes	482	1.67E-06 [5]	1.8E-03	0.082	1.8E-03	0.094
Fluorene	86-73-7	Yes	483	3.01E-06 [5]	3.2E-03	0.15	3.2E-03	0.17
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	484	1.02E-07 [5]	1.1E-04	5.0E-03	1.1E-04	5.7E-03
2-Methyl naphthalene	91-57-6	Yes	485	1.40E-06 [5]	1.5E-03	0.069	1.5E-03	0.079
Naphthalene	91-20-3	Yes	320	9.96E-05 [5]	0.10	4.90	0.10	5.60
Perylene	198-55-0	Yes	486	3.20E-08 [5]	3.4E-05	1.6E-03	3.4E-05	1.8E-03
Phenanthrene	85-01-8	Yes	487	6.46E-06 [5]	6.8E-03	0.32	6.8E-03	0.36
Pyrene	129-00-0	Yes	488	3.54E-06 [5]	3.7E-03	0.17	3.7E-03	0.20
Dioxans & Furans								
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	440	9.53E-13 [5]	1.0E-09	4.7E-08	1.0E-09	5.4E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	441	1.33E-12 [5]	1.4E-09	6.5E-08	1.4E-09	7.5E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	442	8.70E-13 [5]	9.1E-10	4.3E-08	9.1E-10	4.9E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	443	2.09E-12 [5]	2.2E-09	1.0E-07	2.2E-09	1.2E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	444	2.21E-12 [5]	2.3E-09	1.1E-07	2.3E-09	1.2E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	445	9.76E-12 [5]	1.0E-08	4.8E-07	1.0E-08	5.5E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	446	2.46E-11 [5]	2.6E-08	1.2E-06	2.6E-08	1.4E-06
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	447	8.04E-12 [5]	8.5E-09	4.0E-07	8.5E-09	4.5E-07
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	448	3.99E-12 [5]	4.2E-09	2.0E-07	4.2E-09	2.2E-07
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	449	6.09E-12 [5]	6.4E-09	3.0E-07	6.4E-09	3.4E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	450	3.56E-12 [5]	3.7E-09	1.8E-07	3.7E-09	2.0E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	451	3.16E-12 [5]	3.3E-09	1.6E-07	3.3E-09	1.8E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	452	6.67E-13 [5]	7.0E-10	3.3E-08	7.0E-10	3.8E-08
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	453	2.66E-12 [5]	2.8E-09	1.3E-07	2.8E-09	1.5E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	454	5.71E-12 [5]	6.0E-09	2.8E-07	6.0E-09	3.2E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	455	7.98E-13 [5]	8.4E-10	3.9E-08	8.4E-10	4.5E-08
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	456	5.00E-12 [5]	5.3E-09	2.5E-07	5.3E-09	2.8E-07
PCBs & Phthalates								
dichlorobiphenyla	--	--	--	7.35E-10	7.7E-07	3.6E-05	7.7E-07	4.1E-05
hexachlorobiphenyla	--	--	--	5.45E-10	5.7E-07	2.7E-05	5.7E-07	3.1E-05
pentachlorobiphenyla	--	--	--	1.20E-09	1.3E-06	5.9E-05	1.3E-06	6.8E-05
tetrachlorobiphenyla	--	--	--	2.50E-09	2.6E-06	1.2E-04	2.6E-06	1.4E-04
trichlorobiphenyla	--	--	--	2.61E-09	2.7E-06	1.3E-04	2.7E-06	1.5E-04
Total PCBs	1336-36-3	Yes	409	7.59E-09 [5]	8.0E-06	3.7E-04	8.0E-06	4.3E-04
Decachlorobiphenyl	2051-24-3	Yes	438	2.65E-10 [5]	2.8E-07	1.3E-05	2.8E-07	1.5E-05
1-Methylphenanthrene	832-69-9	No	307	2.59E-07 [5]	2.7E-04	0.013	2.7E-04	0.015
3-Methylcholanthrene	56-49-5	Yes	496	8.68E-09 [5]	9.1E-06	4.3E-04	9.1E-06	4.9E-04
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	493	4.57E-09 [5]	4.8E-06	2.2E-04	4.8E-06	2.6E-04
2,4-Dinitrotoluene	121-14-2	Yes	204	9.42E-07 [5]	9.9E-04	0.046	9.9E-04	0.053
4,6-Dinitro-o-cresol (and salts)	534-52-1	Yes	202	2.10E-06 [5]	2.2E-03	0.10	2.2E-03	0.12
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	59	4.65E-08 [5]	4.9E-05	2.3E-03	4.9E-05	2.6E-03
Butyl benzyl phthalate	85-68-7	No	74	2.68E-05 [5]	0.028	1.32	0.028	1.51
Hydrogen cyanide	74-90-8	No	135	2.05E-05 [5]	0.022	1.01	0.022	1.15
di-n-octylphthalateb	117-84-0	--	518	1.10E-07 [5]	1.2E-04	5.4E-03	1.2E-04	6.2E-03
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	224	2.92E-05 [5]	0.031	1.44	0.031	1.64
Isopropylbenzene (Cumene)	98-82-8	Yes	275	1.77E-05 [5]	0.019	0.87	0.019	1.00
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	164	2.79E-04 [5]	0.29	13.7	0.29	15.7
Vinyl Chloride	75-01-4	Yes	598	1.84E-05 [5]	0.019	0.90	0.019	1.04
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	574	1.99E-05 [5]	0.021	0.98	0.021	1.12
4-nitrophenol	100-02-7	Yes	350	1.14E-07 [5]	1.2E-04	5.6E-03	1.2E-04	6.4E-03
2-Chlorophenol	95-57-8	No	111	2.35E-08 [5]	2.5E-05	1.2E-03	2.5E-05	1.3E-03
2,4-Dinitrophenol	51-28-5	Yes	203	1.80E-07 [5]	1.9E-04	8.9E-03	1.9E-04	0.010
Trichlorofluoromethane (Freon 11)	75-69-4	No	575	1.39E-05 [5]	0.015	0.68	0.015	0.78
2,4,6-Trichlorophenol	88-06-2	Yes	577	2.00E-07 [5]	2.1E-04	9.8E-03	2.1E-04	0.011
Pentachlorophenol	87-86-5	Yes	371	2.14E-07 [5]	2.3E-04	0.011	2.3E-04	0.012
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	547	2.46E-05 [5]	0.026	1.21	0.026	1.38
Total TAC Emissions Estimate					**14.3**	**667**	**14.3**	**763**
Total HAP Emissions Estimate					**8.10**	**379**	**8.10**	**434**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (maximum daily heat input [MMBtu/day])
Maximum daily heat input (MMBtu/day) = 1,051 (1)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/MMBtu]) x (annual heat input [MMBtu/yr])
2019 annual heat input (MMBtu/yr) = 49,168 (1)
PTE annual heat input (MMBtu/yr) = 56,264 (1)

References:

(1) See Table 1, Input Process Rates and Parameters.
(2) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet scrubber control.
(3) Boiler MACT compliance Source Test Report (2019). Representative of the 3-run average from the wet scrubber outlet.
(4) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with ESP or fabric filter control.
(5) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler.
(6) NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet control device.
(7) AP-42 Chapter 1 (March 2022), Table 1.6-3, "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion." Emission factors are for uncontrolled sources.

Table 8
Fuel Dryer TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/ODT)	Estimated Control [2] Efficiency (%)	2019 Emission Estimates		PTE Emission Estimates	
						Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Organic Compounds									
Acetaldehyde	75-07-0	Yes	1	7.9E-03 [4]	21.0	0.59	15.0	0.59	53.0
Acetophenone	98-86-2	Yes	5	3.1E-05 [5]	1.00	2.9E-03	0.074	2.9E-03	0.26
Acetone	67-64-1	No	3	0.043 [6]	21.0	3.20	81.6	3.20	288
Acrolein	107-02-8	Yes	6	0.019 [4]	44.0	1.00	25.5	1.00	90.1
Benzene	71-43-2	Yes	44	2.6E-03 [5]	0	0.25	6.35	0.25	22.4
Bromomethane (Methyl bromide)	74-83-9	Yes	64	4.6E-05 [6]	3.00	4.2E-03	0.11	4.2E-03	0.38
Chloromethane (Methyl chloride)	74-87-3	Yes	108	1.9E-04 [6]	1.00	0.017	0.44	0.017	1.57
Crotonaldehyde	4170-30-3	No	132	5.5E-03 [5]	33.0	0.35	8.85	0.35	31.2
Cumene	98-82-8	Yes	275	3.7E-05 [5]	0	3.5E-03	0.088	3.5E-03	0.31
Formaldehyde	50-00-0	Yes	240	0.022 [4]	85.0	0.31	7.89	0.31	27.8
Methanol	67-56-1	Yes	288	0.020 [4]	95.0	0.094	2.40	0.094	8.47
Methylene chloride	75-09-2	Yes	170	8.6E-04 [6]	2.00	0.080	2.05	0.080	7.24
Methyl ethyl ketone	78-93-3	No	68	3.7E-03 [5]	44.0	0.20	5.01	0.20	17.7
Methyl isobutyl ketone	108-10-1	Yes	300	2.8E-03 [5]	4.00	0.25	6.40	0.25	22.6
Naphthalene	91-20-3	Yes	320	3.8E-03 [5]	0	0.36	9.11	0.36	32.2
Phenol	108-95-2	Yes	383	0.023 [5]	17.0	1.84	46.9	1.84	165
Propionaldehyde	123-38-6	Yes	510	9.9E-03 [5]	65.0	0.33	8.37	0.33	29.5
Styrene	100-42-5	Yes	536	1.2E-04 [5]	0	0.011	0.28	0.011	0.99
Toluene	108-88-3	Yes	555	4.3E-03 [5]	0	0.41	10.4	0.41	36.7
1,2,4-Trimethyl benzene	95-63-6	No	588	6.4E-05 [5]	0	6.1E-03	0.16	6.1E-03	0.55
Vinyl acetate	108-05-4	Yes	596	2.9E-05 [5]	4.00	2.7E-03	0.068	2.7E-03	0.24
m-Xylene	108-38-3	Yes	603	1.3E-03 [7]	0	0.12	3.15	0.12	11.1
p-Xylene	106-42-3	Yes	605	1.3E-03 [7]	0	0.12	3.15	0.12	11.1
o-Xylene	95-47-6	Yes	604	2.3E-05 [6]	0	2.2E-03	0.055	2.2E-03	0.20
Total TAC Emissions Estimate						**9.54**	**243**	**9.54**	**859**
Total HAP Emissions Estimate						**5.80**	**148**	**5.80**	**522**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (maximum daily heat input [MMBtu/day])
Maximum daily throughput (ODT/day) = 95.0 (3)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/MMBtu]) x (annual heat input [MMBtu/yr])
2019 annual throughput (ODT/yr) = 2,424 (3)
PTE annual throughput (ODT/yr) = 8,554 (3)

References:

(1) Emissions factors were included assuming the following heirchy: 1) NCASI Wood Products database ("direct wood-fired green pre-dryer"), 2) NCASI Wood Products database ("direct wood-fired, green dryer"), and 3) NCASI Wood Products database ("rotary dryer").
(2) Control efficiency estimated using solubility rates of organic TAPs. See Table 5, Solubility Constants and Associated Control Efficiency Estimates.
(3) See Table 1, Input Process Rates and Parameters.
(4) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, direct wood-fired, green pre-dryer.
(5) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, rotary dryer.
(6) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, direct wood-fired, green dryer. See NCASI Master Summary spreadsheet dated February, 2013.
(7) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, rotary dryer. Assumes that emission factor is one-half of emission factor for m.p-xylene.

Table 9
Kilns (Douglas Fir) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/Mbdft)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.043	41.3	4,901	41.3	6,285
Acrolein	107-02-8	Yes	6	8.0E-04	0.77	91.2	0.77	117
Formaldehyde	50-00-0	Yes	240	2.1E-03	2.02	239	2.02	307
Methanol	67-56-1	Yes	288	0.063	60.3	7,157	60.3	9,179
Propionaldehyde	123-38-6	Yes	510	9.0E-04	0.86	103	0.86	132
Total TAC Emissions Estimate					**105**	**12,491**	**105**	**16,019**
Total HAP Emissions Estimate					**105**	**12,491**	**105**	**16,019**

Notes:

(a) Daily emissions estimate (lb/day) = (maximum emission factor of Douglas Fir [lb/Mbdft]) x (maximum daily throughput [Mbdft/day])

Maximum daily throughput (Mbdft/day) = 960 (2)

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of Douglas Fir [lb/Mbdft]) x (annual throughput [Mbdft/yr])

2019 annual throughput (Mbdft/yr) = 113,966 (2)

PTE annual throughput (Mbdft/yr) = 146,160 (2)

References:

(1) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Douglas Fir species with a maximum inlet temperature of 190°F.

(2) See Table 1, Input Process Rates and Parameters.

Table 10
Kilns (Hemlock) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/Mbdft)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.11	108	2,377	108	3,435
Acrolein	107-02-8	Yes	6	1.8E-03	1.73	37.9	1.73	54.8
Formaldehyde	50-00-0	Yes	240	2.1E-03	2.02	44.2	2.02	64.0
Methanol	67-56-1	Yes	288	0.11	106	2,318	106	3,350
Propionaldehyde	123-38-6	Yes	510	1.2E-03	1.15	25.3	1.15	36.5
Total TAC Emissions Estimate					**219**	**4,802**	**219**	**6,941**
Total HAP Emissions Estimate					**219**	**4,802**	**219**	**6,941**

Notes:

(a) Daily emissions estimate (lb/day) = (maximum emission factor of Hemlock [lb/Mbdft]) x (maximum daily throughput [Mbdft/day])

Maximum daily throughput (Mbdft/day) = 960 (2)

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of Hemlock [lb/Mbdft]) x (annual throughput [Mbdft/yr])

2019 annual throughput (Mbdft/yr) = 21,069 (2)

PTE annual throughput (Mbdft/yr) = 30,456 (2)

References:

(1) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western Hemlock species with a maximum inlet temperature of 200°F.

(2) See Table 1, Input Process Rates and Parameters.

Table 11
Kilns (True fir) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/Mbdft)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.055 [2]	52.8	143	52.8	186
Acrolein	107-02-8	Yes	6	1.8E-03 [3]	1.73	4.67	1.73	6.09
Formaldehyde	50-00-0	Yes	240	7.3E-03 [2]	7.01	18.9	7.01	24.7
Methanol	67-56-1	Yes	288	0.23 [2]	220	595	220	777
Propionaldehyde	123-38-6	Yes	510	1.2E-03 [3]	1.15	3.11	1.15	4.06
Total TAC Emissions Estimate					**283**	**765**	**283**	**998**
Total HAP Emissions Estimate					**283**	**765**	**283**	**998**

Notes:

(a) Daily emissions estimate (lb/day) = (maximum emission factor of Hemlock [lb/Mbdft]) x (maximum daily throughput [Mbdft/day])

Maximum daily throughput (Mbdft/day) = 960 (1)

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of Hemlock [lb/Mbdft]) x (annual throughput [Mbdft/yr])

2019 annual throughput (Mbdft/yr) = 2,594 (1)

PTE annual throughput (Mbdft/yr) = 3,384 (1)

References:

(1) See Table 1, Input Process Rates and Parameters.

(2) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western True Fir species with a maximum inlet temperature of 200°F.

(3) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western Hemlock species with a maximum inlet temperature of 200°F.

Table 12
Press (Fugitive) TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/Mbdft)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.016	0.11	12.5	0.11	20.2
Acetone	67-64-1	No	3	5.5E-03	0.039	4.31	0.039	6.93
Formaldehyde	50-00-0	Yes	240	0.014	0.099	11.0	0.099	17.6
Methanol	67-56-1	Yes	288	0.24	1.69	188	1.69	302
m,p-Xylene	1330-20-7	Yes	602	5.3E-03	0.037	4.15	0.037	6.68
o-Xylene	95-47-6	Yes	604	3.6E-03	0.025	2.82	0.025	4.54
Phenol	108-95-2	Yes	383	0.010	0.070	7.83	0.070	12.6
Toluene	108-88-3	Yes	555	1.1E-03	7.7E-03	0.86	7.7E-03	1.39
Total TAC Emissions Estimate					**2.08**	**231**	**2.08**	**372**
Total HAP Emissions Estimate					**2.04**	**227**	**2.04**	**365**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/Mbdft]) x (maximum daily production [Mbdft/day])

Percentage of emissions lost as fugitive (%) = 1.20 (2)

Maximum daily production (Mbdft/day) = 586.8 (3)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/Mbdft]) x (annual production [Mbdft/yr])

Percentage of emissions lost as fugitive (%) = 1.20 (2)

2019 annual production (Mbdft/yr) = 65,275 (3)

PTE annual production (Mbdft/yr) = 105,000 (3)

References:

(1) AP-42 Chapter 10 (October 2002), Table 10.6.4-6, "Emission Factors for Hardboard Presses - Organics." Representative of Hardboard hot press, PF resin with no control.

(2) Non-captured amount as calculated using the capture efficiency demonstrated in a January 2009 source test.

(3) See Table 1, Input Process Rates and Parameters.

Table 13
Press (Stack) TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/Mbdft)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	3.3E-03	1.91	213	1.91	342
Acetone	67-64-1	No	3	3.9E-03	2.26	252	2.26	405
Formaldehyde	50-00-0	Yes	240	3.4E-03	1.97	219	1.97	353
Methanol	67-56-1	Yes	288	0.15	87.0	9,674	87.0	15,561
Total TAC Emissions Estimate					**93.1**	**10,357**	**93.1**	**16,661**
Total HAP Emissions Estimate					**90.8**	**10,106**	**90.8**	**16,256**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/Mbdft]) x (maximum daily production [Mbdft/day]) X (capture efficiency [%]/100)

Percentage of emissions through stack (%) = 98.8 (2)

Maximum daily production (Mbdft/day) = 586.8 (3)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/Mbdft]) x (annual production [Mbdft/yr]) X (capture efficiency [%]/100)

Percentage of emissions through stack (%) = 98.8 (2)

2019 annual production (Mbdft/yr) = 65,275 (3)

PTE annual production (Mbdft/yr) = 105,000 (3)

References:

(1) AP-42 Chapter 10 (October 2002), Table 10.6.4-6, "Emission Factors for Hardboard Presses - Organics." Representative of Hardboard hot press, PF resin with scrubber control.

(2) Capture efficiency demonstrated in a January 2009 source test.

(3) See Table 1, Input Process Rates and Parameters.

Table 14
Refiner (Rotary Valve) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/ODT)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	1.3E-03 [2]	0.24	26.5	0.24	46.3
Acetone	67-64-1	No	3	4.2E-03 [3]	0.77	86.3	0.77	151
Acrolein	107-02-8	Yes	6	BDL [2]	--	--	--	--
Formaldehyde	50-00-0	Yes	240	3.6E-04 [2]	0.065	7.32	0.065	12.8
Methanol	67-56-1	Yes	288	1.3E-03 [2]	0.23	25.9	0.23	45.3
Methyl ethyl ketone (MEK)	78-93-3	No	68	2.5E-04 [4]	0.046	5.14	0.046	8.99
Methyl isobutyl ketone	108-10-1	Yes	300	2.6E-04 [4]	0.047	5.30	0.047	9.28
Propionaldehyde	123-38-6	Yes	510	BDL [2]	--	--	--	--
Styrene	100-42-5	Yes	536	1.8E-04 [4]	0.033	3.74	0.033	6.55
Total TAC Emissions Estimate					**1.43**	**160**	**1.43**	**280**
Total HAP Emissions Estimate					**0.61**	**68.7**	**0.61**	**120**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/ODT]) x (maximum daily throughput [ODT/day])

Maximum daily throughput (ODT/day) = 183 (1)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/ODT]) x (annual throughput [ODT/yr])

2019 annual throughput (ODT/yr) = 20,556 (1)

PTE annual throughput (ODT/yr) = 35,964 (1)

References:

(1) See Table 1, Input Process Rates and Parameters.

(2) Emission factors are from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the rotary valve outlet.

(3) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled Hardboard pressurized digester/refiner, hardwood.

(4) NCASI Air Emissions Databases - Pullp and Paper. Representative of an uncontrolled hardboard refiner. Represents mean emission factor. Hardboard pressurized digester/refiner, hardwood.

Table 15
Refiner (Scrubber 5) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/ODT)	Estimated Control Efficiency (%)	2019 Emission Estimates		PTE Emission Estimates	
						Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.035 (1)	21.0 (2)	5.06 (a)	567 (b)	5.06 (a)	992 (b)
Acetone	67-64-1	No	3	4.2E-03 (4)	21.0 (2)	0.61 (a)	68.2 (b)	0.61 (a)	119 (b)
Acrolein	107-02-8	Yes	6	5.4E-03 (1)	44.0 (2)	0.56 (a)	62.3 (b)	0.56 (a)	109 (b)
Formaldehyde	50-00-0	Yes	240	3.5E-03 (c)	(7)	0.65 (d)	72.6 (e)	0.65 (d)	127 (e)
Methanol	67-56-1	Yes	288	3.1E-03 (c)	(7)	0.58 (d)	64.6 (e)	0.58 (d)	113 (e)
Methyl ethyl ketone	78-93-3	No	68	2.5E-04 (8)	44.0 (2)	0.026 (a)	2.88 (b)	0.026 (a)	5.03 (b)
Methyl isobutyl ketone	108-10-1	Yes	300	2.6E-04 (8)	4.00 (2)	0.045 (a)	5.09 (b)	0.045 (a)	8.91 (b)
Propionaldehyde	123-38-6	Yes	510	1.1E-03 (1)	65.0 (2)	0.069 (a)	7.79 (b)	0.069 (a)	13.6 (b)
Styrene	100-42-5	Yes	536	1.8E-04 (8)	0 (2)	0.033 (a)	3.74 (b)	0.033 (a)	6.55 (b)
Total TAC Emissions Estimate						**7.62**	**854**	**7.62**	**1,495**
Total HAP Emissions Estimate						**6.99**	**783**	**6.99**	**1,371**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/ODT]) x (maximum daily throughput [ODT/day]) x (1 - control efficiency [%] / 100)
Maximum daily throughput (ODT/day) = 183 (3)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/ODT]) x (annual throughput [ODT/yr]) x (1 - control efficiency [%] / 100)
2019 annual throughput (ODT/yr) = 20,556 (3)
PTE annual throughput (ODT/yr) = 35,964 (3)

(c) Emission factor (lb/ODT) = (source test emission rate [lb/hr]) / (hourly production rate during source test [ODT/hr])
Hourly production rate during source test (ODT/hr) = 7.64 (5)
Formaldehyde emission rate (lb/hr) = 0.027 (6)
Methanol emission rate (lb/hr) = 0.024 (6)

(d) Daily emissions estimate (lb/day) = (controlled emission factor [lb/ODT]) x (maximum daily throughput [ODT/day])

(e) Annual emissions estimate (lb/yr) = (controlled emission factor [lb/ODT]) x (annual throughput [ODT/yr])

References:

(1) Emission factors are derived from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the mixing chest outlet, which at the time, was uncontrolled. Since 2007, the mixing chest outlet now vents to a wet scrubber (Scrubber 5) for emissions control.

(2) See Table 5, Solubility Constants and Associated Control Efficiency Estimates.

(3) See Table 1, Input Process Rates and Parameters.

(4) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled Hardboard pressurized digester/refiner, hardwood.

(5) Represents the hourly wood production rate (ODT/hr) during the 2010 source test. Note: The hourly production rate in the 2010 source test report (8.66 tons/hr) includes wax and resin, which can be variable. The wood-content from this production rate was calculated using historical resin and wax data during the time the source test was performed.

(6) Emission factors derived from Source Test Evaluation Report (2010). Representative of controlled emissions from the scrubber No, 5 Outlet.

(7) Emission factor is representative of wet scrubber control for this pollutant.

(8) NCASI Air Emissions Databases - Pullp and Paper. Representative of an uncontrolled hardboard refiner. Represents mean emission factor.

Table 16
Forming Line (Stack) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/ODT)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	7.3E-03 [3]	1.33	149	1.33	261
Acetone	67-64-1	No	3	3.2E-03 [4]	0.59	65.8	0.59	115
Acrolein	107-02-8	Yes	6	6.2E-04 [3]	0.11	12.7	0.11	22.2
Formaldehyde	50-00-0	Yes	240	2.9E-03 [3]	0.53	59.1	0.53	103
Methanol	67-56-1	Yes	288	0.016 [3]	3.01	338	3.01	591
Methyl Ethyl Ketone	78-93-3	No	68	4.5E-04 [4]	0.083	9.25	0.083	16.2
Methyl Isobutyl Ketone	108-10-1	Yes	300	2.3E-04 [4]	0.042	4.71	0.042	8.24
Phenol	108-95-2	Yes	383	BDL [3]	--	--	--	--
Propionaldehyde	123-38-6	Yes	510	BDL [3]	--	--	--	--
Toluene	108-88-3	Yes	555	4.5E-04 [4]	0.083	9.31	0.083	16.3
Total TAC Emissions Estimate					**5.78**	**648**	**5.78**	**1,134**
Total HAP Emissions Estimate					**5.11**	**573**	**5.11**	**1,002**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/ODT]) x (maximum daily throughput [ODT/day])
Maximum daily throughput (ODT/day) = 183 (2)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/ODT]) x (annual throughput [ODT/yr])
2019 annual throughput (ODT/yr) = 20,556 (2)
PTE annual throughput (ODT/yr) = 35,964 (2)

References:

(1) Emission factors provided by DEQ as part of revised air toxics submittal.
(2) See Table 1, Input Process Rates and Parameters.
(3) Source Test Evaluation Report prepared by Horizon Engineering LLC. for Stimson Lumber Company dated July 12, 2007. Source test conducted on forming line vacuum pump.
(4) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled hardboard former vacuum system, wet, PF resin.

Table 17
Forming Line (Fugitive) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/ODT)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Acetaldehyde	75-07-0	Yes	1	7.3E-03 [4]	0.13	14.9	0.13	26.1
Acetone	67-64-1	No	3	3.2E-03 [5]	0.059	6.58	0.059	11.5
Acrolein	107-02-8	Yes	6	6.2E-04 [4]	0.011	1.27	0.011	2.22
Formaldehyde	50-00-0	Yes	240	2.9E-03 [4]	0.053	5.91	0.053	10.3
Methanol	67-56-1	Yes	288	0.016 [4]	0.30	33.8	0.30	59.1
Methyl Ethyl Ketone	78-93-3	No	68	4.5E-04 [5]	8.3E-03	0.93	8.3E-03	1.62
Methyl Isobutyl Ketone	108-10-1	Yes	300	2.3E-04 [5]	4.2E-03	0.47	4.2E-03	0.82
Phenol	108-95-2	Yes	383	BDL [5]	--	--	--	--
Propionaldehyde	123-38-6	Yes	510	BDL [5]	--	--	--	--
Toluene	108-88-3	Yes	555	4.5E-04 [5]	8.3E-03	0.93	8.3E-03	1.63
Total TAC Emissions Estimate					**0.58**	**64.8**	**0.58**	**113**
Total HAP Emissions Estimate					**0.51**	**57.3**	**0.51**	**100**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/ODT]) x (maximum daily throughput [ODT/day]) x (fugitive emissions loss [%])

Fugitive emissions loss (%) = 10% (2)

Maximum daily throughput (ODT/day) = 183 (3)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/ODT]) x (annual throughput [ODT/yr]) x (fugitive emissions loss [%])

Fugitive emissions loss (%) = 10% (2)

2019 annual throughput (ODT/yr) = 20,556 (3)

PTE annual throughput (ODT/yr) = 35,964 (3)

References:

(1) Emission factors provided by DEQ as part of revised air toxics submittal.

(2) Per engineering judgement, fugitive emissions from the forming line have been conservatively estimated as 10% of forming line emissions.

(3) See Table 1, Input Process Rates and Parameters.

(4) Source Test Evaluation Report prepared by Horizon Engineering LLC. for Stimson Lumber Company dated July 12, 2007. Source test conducted on forming line vacuum pump.

(5) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled hardboard former vacuum system, wet, PF resin.

Table 18
Hardboard Wastewater TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Emission Unit	CAS	HAP?	Concentration (ppm)	WATER9 Model Output [1] (g/s)		Wastewater Treatment Plant Total Emissions Estimate			
						2019		PTE	
				2019	PTE	(lb/day) [a]	(lb/yr) [b]	(lb/day) [c]	(lb/yr) [d]
Whitewater Chest									
Acetone	67-64-1	No	0.56 [3]	5.87E-05	8.80E-05	1.1E-02	4.08	1.7E-02	6.12
Formaldehyde	50-00-0	Yes	16.0 [3]	1.54E-04	2.31E-04	2.9E-02	10.7	4.4E-02	16.1
Acetaldehyde	75-07-0	Yes	1.30 [4]	1.54E-04	2.31E-04	2.9E-02	10.7	4.4E-02	16.1
Phenol	108-95-2	Yes	0.0522 [3]	2.38E-06	3.57E-06	4.5E-04	0.17	6.8E-04	0.25
Propionaldehyde	123-38-6	Yes	0.06 [4]	6.43E-06	9.65E-06	1.2E-03	0.45	1.8E-03	0.67
Methyl Isobutyl Ketone	108-10-1	Yes	0.16 [5]	1.52E-05	2.28E-05	2.9E-03	1.06	4.3E-03	1.59
Acrolein	107-02-8	Yes	0 [3]	1.13E-24	1.69E-24	2.1E-22	7.8E-20	3.2E-22	1.2E-19
Machine Chest									
Acetone	67-64-1	No	0.733 [6]	8.03E-04	1.21E-03	0.15	55.9	0.23	83.8
Formaldehyde	50-00-0	Yes	55.0 [6]	5.41E-04	8.12E-04	0.10	37.6	0.15	56.5
Acetaldehyde	75-07-0	Yes	1.30 [4]	2.38E-03	3.57E-03	0.45	165	0.68	248
Phenol	108-95-2	Yes	0.048 [6]	3.07E-06	4.61E-06	5.9E-04	0.21	8.8E-04	0.32
Propionaldehyde	123-38-6	Yes	0.06 [4]	8.53E-05	1.28E-04	1.6E-02	5.93	2.4E-02	8.90
Methyl Isobutyl Ketone	108-10-1	Yes	0.16 [5]	6.50E-04	9.75E-04	0.12	45.2	0.19	67.8
Acrolein	107-02-8	Yes	0.126 [6]	2.84E-04	4.26E-04	5.4E-02	19.7	8.1E-02	29.6
Headerbox									
Acetone	67-64-1	No	0.62 [7]	1.79E-04	2.69E-04	3.4E-02	12.5	5.1E-02	18.7
Formaldehyde	50-00-0	Yes	67.0 [7]	1.27E-04	1.90E-04	2.4E-02	8.81	3.6E-02	13.2
Acetaldehyde	75-07-0	Yes	1.30 [4]	6.80E-04	1.02E-03	0.13	47.3	0.19	70.9
Phenol	108-95-2	Yes	0.073 [7]	1.42E-06	2.13E-06	2.7E-04	9.9E-02	4.1E-04	0.15
Propionaldehyde	123-38-6	Yes	0.06 [4]	2.51E-05	3.76E-05	4.8E-03	1.74	7.2E-03	2.61
Methyl Isobutyl Ketone	108-10-1	Yes	0.16 [5]	2.33E-04	3.50E-04	4.4E-02	16.2	6.7E-02	24.3
Acrolein	107-02-8	Yes	0 [7]	6.73E-24	1.01E-23	1.3E-21	4.7E-19	1.9E-21	7.0E-19
Total TACS						**1.22**	**444**	**1.82**	**666**
Total HAPS						**1.02**	**371**	**1.53**	**557**

Notes:

(a) 2019 daily emission estimate (lb/day) = (2019 wastewater treatment plan total emissions estimate [lb/yr] / (2019 annual days of operation)
2019 annual days of operation (day/yr) = 365 (2)

(b) 2019 annual emission estimate (lb/yr) = (2019 WATER9 model output [g/s]) x (3,600 s/hr) x (8,760 hr/yr) / 453.59 [g/lb])

(c) PTE daily emission estimate (lb/day) = (PTE wastewater treatment plan total emissions estimate [lb/yr] / (PTE annual days of operation)
PTE annual days of operation (day/yr) = 365 (2)

(d) PTE annual emission estimate (lb/yr) = (PTE WATER9 model output [g/s]) x (3,600 s/hr) x (8,760 hr/yr) / 453.59 [g/lb])

References:

(1) Annual emissions were estimated using the WATER9 wastewater treatment model. 2019 emission rates were estimated by using the ratio between PTE water usage and 2019 water usage.

(2) See Table 1, Input Process Rates and Parameters.

(3) Apex Laboratories Analytical Report (August 25, 2022) for the Stimson Lumber Company Forest Grove Complex. Value representative of concentration sampled at the Whitewater Chest.

(4) NCASI TB 773 Table 5.1.4 - Process Liquid Sample Analysis Results. Representative of primary clarifier water. Mill 053 was determined to be most representative of all tested.

(5) NCASI TB 773 Table 5.1.4 - Process Liquid Sample Analysis Results. Representative of white water. White water analysis was chosen for this TAC, as the primary clarifier testing resulted in non-detect values for all tests.

(6) Apex Laboratories Analytical Report (August 25, 2022) for the Stimson Lumber Company Forest Grove Complex. Value representative of concentration sampled at the Machine Chest.

(7) Apex Laboratories Analytical Report (August 25, 2022) for the Stimson Lumber Company Forest Grove Complex. Value representative of concentration sampled at the Headerbox.

Table 19
Wastewater Treatment Plant TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Emission Unit	CAS	HAP?	Concentration (ppm)	WATER9 Model Output [1] (g/s)		Wastewater Treatment Plant Total Emissions Estimate			
						2019		PTE	
				2019	PTE	(lb/day) [a]	(lb/yr) [b]	(lb/day) [c]	(lb/yr) [d]
Scrubber Wastewater Hydrosieve									
Acetone	67-64-1	No	0.24 [2]	1.96E-05	3.93E-05	3.73E-03	1.36	7.49E-03	2.73
Formaldehyde	50-00-0	Yes	0.5 [2]	3.85E-07	7.72E-07	7.33E-05	0.03	1.47E-04	0.05
Acetaldehyde	75-07-0	Yes	0.04 [2]	7.63E-06	1.53E-05	1.45E-03	0.5	2.91E-03	1.06
Phenol	108-95-2	Yes	0.10 [2]	1.12E-07	2.24E-07	2.13E-05	0.01	4.27E-05	0.02
Propionaldehyde	123-38-6	Yes	0.17 [2]	2.26E-05	4.53E-05	4.30E-03	1.57	8.63E-03	3.15
Methyl Isobutyl Ketone	108-10-1	Yes	0.003 [2]	1.75E-06	3.52E-06	3.34E-04	0.1	6.70E-04	0.24
Acrolein	107-02-8	Yes	0.22 [2]	5.13E-05	1.03E-04	9.78E-03	3.6	1.96E-02	7.2
Hydrosieves									
Acetone	67-64-1	No	0.293 [4]	9.55E-05	1.92E-04	1.82E-02	6.64	3.65E-02	13.3
Formaldehyde	50-00-0	Yes	19.0 [4]	4.36E-05	8.75E-05	8.31E-03	3.03	1.67E-02	6.08
Acetaldehyde	75-07-0	Yes	1.30 [5]	8.02E-04	1.61E-03	1.53E-01	55.8	3.07E-01	111.9
Phenol	108-95-2	Yes	0.063 [4]	1.14E-06	2.29E-06	2.17E-04	0.08	4.36E-04	0.16
Propionaldehyde	123-38-6	Yes	0.06 [5]	2.95E-05	5.92E-05	5.62E-03	2.05	1.13E-02	4.12
Methyl Isobutyl Ketone	108-10-1	Yes	0.16 [6]	3.63E-04	7.29E-04	6.92E-02	25.3	1.39E-01	50.7
Acrolein	107-02-8	Yes	ND [4]	8.02E-24	1.61E-23	1.53E-21	0.0	3.07E-21	0.0
Surge Pond									
Acetone	67-64-1	No	[7]	5.56E-05	1.12E-04	1.06E-02	3.87	2.13E-02	7.76
Formaldehyde	50-00-0	Yes	[7]	5.53E-04	1.11E-03	1.05E-01	38.5	2.11E-01	77.2
Acetaldehyde	75-07-0	Yes	[7]	1.45E-03	2.90E-03	2.75E-01	100.5	5.52E-01	201.6
Phenol	108-95-2	Yes	[7]	4.36E-08	8.75E-08	8.31E-06	0.00	1.67E-05	6.08E-03
Propionaldehyde	123-38-6	Yes	[7]	4.83E-05	9.69E-05	9.20E-03	3.36	1.85E-02	6.74
Methyl Isobutyl Ketone	108-10-1	Yes	[7]	5.58E-05	1.12E-04	1.06E-02	3.88	2.13E-02	7.79
Acrolein	107-02-8	Yes	[7]	6.48E-24	1.30E-23	1.23E-21	0.0	2.48E-21	0.0
Aeration Basin									
Acetone	67-64-1	No	[7]	2.80E-07	5.61E-07	5.33E-05	1.94E-02	1.07E-04	3.90E-02
Formaldehyde	50-00-0	Yes	[7]	7.73E-06	1.55E-05	1.47E-03	0.54	2.95E-03	1.08
Acetaldehyde	75-07-0	Yes	[7]	6.03E-05	1.21E-04	1.15E-02	4.19	2.30E-02	8.41
Phenol	108-95-2	Yes	[7]	9.77E-12	1.96E-11	1.86E-09	6.79E-07	3.73E-09	1.36E-06
Propionaldehyde	123-38-6	Yes	[7]	1.42E-06	2.85E-06	2.71E-04	0.10	5.43E-04	0.20
Methyl Isobutyl Ketone	108-10-1	Yes	[7]	3.20E-06	6.43E-06	6.10E-04	0.22	1.22E-03	0.45
Acrolein	107-02-8	Yes	[7]	1.83E-25	3.68E-25	3.49E-23	0.00	7.01E-23	0.00
Secondary Clarifier									
Acetone	67-64-1	No	[7]	5.41E-09	1.09E-08	1.03E-06	3.76E-04	2.07E-06	7.54E-04
Formaldehyde	50-00-0	Yes	[7]	1.27E-07	2.54E-07	2.41E-05	8.80E-03	4.84E-05	1.77E-02
Acetaldehyde	75-07-0	Yes	[7]	9.52E-07	1.91E-06	1.81E-04	6.62E-02	3.64E-04	1.33E-01
Phenol	108-95-2	Yes	[7]	1.99E-13	4.00E-13	3.80E-11	1.39E-08	7.62E-11	2.78E-08
Propionaldehyde	123-38-6	Yes	[7]	2.45E-08	4.91E-08	4.66E-06	1.70E-03	9.35E-06	3.41E-03
Methyl Isobutyl Ketone	108-10-1	Yes	[7]	2.16E-08	4.34E-08	4.12E-06	1.50E-03	8.27E-06	3.02E-03
Acrolein	107-02-8	Yes	[7]	2.58E-27	5.18E-27	4.92E-25	1.80E-22	9.87E-25	3.60E-22
Sludge Pit									
Acetone	67-64-1	No	[7]	1.67E-24	3.36E-24	3.19E-22	1.16E-19	6.40E-22	2.34E-19
Formaldehyde	50-00-0	Yes	[7]	1.54E-10	3.09E-10	2.93E-08	1.07E-05	5.89E-08	2.15E-05
Acetaldehyde	75-07-0	Yes	[7]	2.38E-09	4.78E-09	4.54E-07	1.66E-04	9.10E-07	3.32E-04
Phenol	108-95-2	Yes	[7]	1.39E-16	2.79E-16	2.65E-14	9.67E-12	5.31E-14	1.94E-11
Propionaldehyde	123-38-6	Yes	[7]	5.18E-11	1.04E-10	9.87E-09	3.60E-06	1.98E-08	7.23E-06
Methyl Isobutyl Ketone	108-10-1	Yes	[7]	1.30E-10	2.61E-10	2.48E-08	9.04E-06	4.97E-08	1.81E-05
Acrolein	107-02-8	Yes	[7]	4.28E-25	8.58E-25	8.15E-23	2.97E-20	1.63E-22	5.97E-20
Sludge Pond									
Acetone	67-64-1	No	[7]	2.13E-10	4.27E-10	4.05E-08	1.48E-05	8.13E-08	2.97E-05
Formaldehyde	50-00-0	Yes	[7]	4.05E-08	8.13E-08	7.72E-06	2.82E-03	1.55E-05	5.65E-03
Acetaldehyde	75-07-0	Yes	[7]	1.69E-07	3.39E-07	3.22E-05	1.17E-02	6.46E-05	2.36E-02
Phenol	108-95-2	Yes	[7]	9.12E-16	1.83E-15	1.74E-13	6.34E-11	3.49E-13	1.27E-10
Propionaldehyde	123-38-6	Yes	[7]	3.85E-09	7.72E-09	7.33E-07	2.68E-04	1.47E-06	5.37E-04
Methyl Isobutyl Ketone	108-10-1	Yes	[7]	1.49E-09	2.99E-09	2.84E-07	1.04E-04	5.70E-07	2.08E-04
Acrolein	107-02-8	Yes	[7]	1.42E-23	2.84E-23	2.70E-21	9.84E-19	5.41E-21	1.97E-18
East Pond									
Acetone	67-64-1	No	[7]	4.51E-11	9.06E-11	8.60E-09	3.14E-06	1.73E-08	6.30E-06
Formaldehyde	50-00-0	Yes	[7]	4.29E-08	8.60E-08	8.16E-06	2.98E-03	1.64E-05	5.98E-03
Acetaldehyde	75-07-0	Yes	[7]	1.21E-07	2.43E-07	2.31E-05	8.42E-03	4.63E-05	1.69E-02
Phenol	108-95-2	Yes	[7]	2.69E-17	5.39E-17	5.12E-15	1.87E-12	1.03E-14	3.75E-12
Propionaldehyde	123-38-6	Yes	[7]	2.53E-09	5.08E-09	4.82E-07	1.76E-04	9.68E-07	3.53E-04
Methyl Isobutyl Ketone	108-10-1	Yes	[7]	5.78E-10	1.16E-09	1.10E-07	4.02E-05	2.21E-07	8.06E-05
Acrolein	107-02-8	Yes	[7]	6.98E-24	1.40E-23	1.33E-21	4.85E-19	2.67E-21	9.73E-19
Reuse Pond									
Acetone	67-64-1	No	[7]	4.02E-11	8.07E-11	7.66E-09	2.79E-06	1.54E-08	5.61E-06
Formaldehyde	50-00-0	Yes	[7]	3.32E-08	6.67E-08	6.33E-06	2.31E-03	1.27E-05	4.64E-03
Acetaldehyde	75-07-0	Yes	[7]	8.87E-08	1.78E-07	1.69E-05	6.17E-03	3.39E-05	1.24E-02
Phenol	108-95-2	Yes	[7]	2.30E-17	4.61E-17	4.38E-15	1.60E-12	8.78E-15	3.21E-12
Propionaldehyde	123-38-6	Yes	[7]	1.88E-09	3.78E-09	3.59E-07	1.31E-04	7.20E-07	2.63E-04
Methyl Isobutyl Ketone	108-10-1	Yes	[7]	4.55E-10	9.12E-10	8.66E-08	3.16E-05	1.74E-07	6.34E-05
Acrolein	107-02-8	Yes	[7]	5.48E-24	1.10E-23	1.04E-21	3.81E-19	2.10E-21	7.65E-19
Total TACS						**0.70**	**255**	**1.40**	**512**
Total HAPS						**0.67**	**243**	**1.34**	**488**

Notes:

(a) 2019 daily emission estimate (lb/day) = (2019 wastewater treatment plan total emissions estimate [lb/yr] / (2019 annual days of operation)
2019 annual days of operation (day/yr) = 365 (3)

(b) 2019 annual emission estimate (lb/yr) = (2019 WATER9 model output [g/s]) x (3,600 s/hr) x (8,760 hr/yr) / 453.59 [g/lb])

(c) PTE daily emission estimate (lb/day) = (PTE wastewater treatment plan total emissions estimate [lb/yr] / (PTE annual days of operation)
PTE annual days of operation (day/yr) = 365 (3)

(d) PTE annual emission estimate (lb/yr) = (PTE WATER9 model output [g/s]) x (3,600 s/hr) x (8,760 hr/yr) / 453.59 [g/lb])

References:

(1) Annual emissions were estimated using the WATER9 wastewater treatment model. 2019 emission rates were estimated by using the ratio between PTE water usage and 2019 water usage.

(2) Concentration calculated using estimated removal efficiency of wet scrubber for fuel dryer and scrubber blow down rate of 299 gpm.

(3) See Table 1, Input Process Rates and Parameters.

(4) Apex Laboratories Analytical Report (August 25, 2022) for the Stimson Lumber Company Forest Grove Complex. Value representative of concentration sampled at the hydrosieves.

(5) NCASI TB 773 Table 5.1.4 - Process Liquid Sample Analysis Results. Representative of primary clarifier water. Mill 053 was determined to be most representative of all tested.

(6) NCASI TB 773 Table 5.1.4 - Process Liquid Sample Analysis Results. Representative of white water. White water analysis was chosen for this TAC, as the primary clarifier testing resulted in non-detect values for all tests.

(7) Concentrations at each source in the WWTP are estimated using the WATER9 model and were not individually sampled.

Table 20
Paintline - Basecoat TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Product	Vendor	Air Toxic [1]	CAS	HAP? (Yes/No)	ODEQ Sequence Number	% Weight Pollutant [1]	Product Density [a] (lb/gallon)	2019 Emission Estimates		PTE Emissions Estimate	
								Daily [b] (lb/day)	Annual [c] (lb/yr)	Daily [b] (lb/day)	Annual [c] (lb/yr)
Paintline - Basecoat 631-W020-1601	Akzo Nobel	Ethylene glycol monobutyl ether	111-76-2	Yes	228	1.50	11.43	0.34	42.7	0.34	66.0
Total Emissions Estimate								**0.34**	**42.7**	**0.34**	**66.0**
Total HAP Emissions Estimate								**0.34**	**42.7**	**0.34**	**66.0**

Notes:

(a) Product density (lb/gal) = (prodcut density [g/cm^3]) x (density of water [lb/gal])

Product density (g/cm^{3}l) = 1.37 (1)

Density of water (lb/gal) = 8.345 (2)

(b) Daily emissions estimate (lb/day) = (maximum daily product usage [gal/day]) x (product density [lb/gal]) x (percent weight pollutant [%] / 100)

Maximum daily product usage (gal/day) = 2.00 (3)

(c) Annual emissions estimate (lbs/yr) = (product usage [gal/yr]) x (product density [lb/gal]) x (weight percent [%] / 100)

2019 annual product usage (gal/yr) = 249 (3)

PTE annual product usage (gal/yr) = 385 (3)

References:

(1) Information from Safety Data Sheet provided by Stimson Lumber Company.

(2) Density of water at 4 degrees Celsius.

(3) See Table 1, Input Process Rates and Parameters.

Table 21
Paintline - High Gloss Topcoat TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Product	Vendor	Air Toxic [1]	CAS	HAP? (Yes/No)	ODEQ Sequence Number	% Weight Pollutant [1]	Product Density [a] (lb/gallon)	2019 Emission Estimates		PTE Emissions Estimate	
								Daily [b] (lb/day)	Annual [c] (lb/yr)	Daily [b] (lb/day)	Annual [c] (lb/yr)
Paintline - High Gloss Topcoat (621-C020-232)	Akzo Nobel	Ethylene glycol monobutyl ether	111-76-2	Yes	228	5.00	8.56	0.428	21	0.428	33.4
Total Emissions Estimate								**0.43**	**21.4**	**0.43**	**33.4**

Notes:

(a) Product density (lb/gal) = (product density [g/cm^3]) x (density of water [lb/gal])

Product density (g/cm^{3}l) =	1.026	(1)
Density of water (lb/gal) =	8.345	(2)

(b) Daily emissions estimate (lb/day) = (maximum daily product usage [gal/day]) x (product density [lb/gal]) x (percent weight pollutant [%] / 100)

Maximum daily product usage (gal/day) =	1.00	(3)

(c) Annual emissions estimate (lb/yr) = (product usage [gal/yr]) x (product density [lb/gal]) x (weight percent [%] / 100)

2019 annual product usage (gal/yr) =	50	(3)
PTE annual product usage (gal/yr) =	78	(3)

References:

(1) Information from Safety Data Sheet provided by Stimson Lumber Company.
(2) Density of water at 4 degrees Celsius.
(3) See Table 1, Input Process Rates and Parameters.

Table 22
Surface Treatment - TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Product	Vendor	Air Toxic [1]	CAS	HAP? (Yes/No)	ODEQ Sequence Number	% Weight Pollutant [1]	Product Density [1] (lb/gallon)	2019 Emission Estimates		PTE Emissions Estimate	
								Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Mycostat P51 Treating Solution	Lonza	Dipropylene glycol monomethyl ether	34590-94-8	No	210	0.55	8.28	11.39	1,284	11.39	2,846
AntiBlu XP-64	Arch Wood Protection, Inc.	Dipropylene glycol monomethyl ether	34590-94-8	No	210	10.00	8.34	8.34	1,932	[4]	[4]
AntiBlu IP-75	Arch Wood Protection, Inc.	Dipropylene glycol monomethyl ether	34590-94-8	No	210	16.5	8.85	14.6	212	[4]	[4]
		Diethylene glycol monobutyl ether	112-34-5	Yes	183	3.00		2.66	38	[4]	[4]
AntiBlu M6 Treating Solution	Arch Wood Protection, Inc.	Dipropylene glycol monomethyl ether	34590-94-8	No	210	0.55	8.29	0	0	22.80	3,670
--		Dipropylene glycol monomethyl ether	34590-94-8	No	210	--		34.3	3,428	34.2	6,517
--		Diethylene glycol monobutyl ether	112-34-5	Yes	183	--		2.66	38.5	--	--
Total TAC Emissions Estimate								**37.0**	**3,467**	**34.2**	**6,517**
Total HAP Emissions Estimate								**2.66**	**38.5**	**--**	**--**

Notes:

(a) Daily emissions estimate (lb/day) = (maximum daily product usage [gal/day]) x (product density [lb/gal]) x (percent weight pollutant [%] / 100)

Maximum daily usage (Mycostat P51) (gal/day) =	250.00	(3)
Maximum daily usage (XP-64) (gal/day) =	10.00	(3)
Maximum daily usage (IP-75) (gal/day) =	10.00	(3)
Maximum daily usage (M6) (gal/day) =	500.00	(3)

(b) Annual emissions estimate (lb/yr) = (product usage [gal/yr]) x (product density [lb/gal]) x (weight percent [%] / 100)

2019 annual usage (Mycostat P51) (gal/yr) =	28,200	(3)
PTE annual usage (Mycostat P51) (gal/yr) =	62,500	(3)
2019 annual usage (XP-64) (gal/yr) =	2,317	(3)
PTE annual usage (XP-64) (gal/yr) =	0	(3)
2019 annual usage (IP-75) (gal/yr) =	145	(3)
PTE annual usage (IP-75) (gal/yr) =	0	(3)
2019 annual usage (M6) (gal/yr) =	0	(3)
PTE annual usage (M6) (gal/yr) =	80,500	(3)

References:

(1) Information from Safety Data Sheet provided by Stimson Lumber Company.
(2) Density of water at 4 degrees Celsius.
(3) See Table 1, Input Process Rates and Parameters.
(4) Product is discontinued.

Table 23
Welding - TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Product	Toxic Air Contaminant [1]	CAS/DEQ ID	Weight Percentage (%)	Usage [2]			Total Emissions Estimate		
				2019 Annual (lb/yr)	Maximum Daily (lb/day)	PTE Annual (lb/yr)	2019 Annual (lb/yr)	Maximum Daily (lb/day)	PTE Annual (lb/yr)
Individual Products									
LIN 11018-18E	Aluminum & Compounds	7429-90-5	93.5 [1]	200	2.00	288	1.02 [a]	0.010 [b]	1.47 [c]
	Manganese	7439-96-5	0.50 [1]				5.5E-03 [a]	5.5E-05 [b]	7.9E-03 [c]
LIN 309L, 18 RED	Manganese	7439-96-5	2.50 [1]	10.0	1.00	104	1.4E-03 [a]	1.4E-04 [b]	0.014 [c]
	Chromium	7440-47-3	2.50 [1]				1.4E-03 [a]	1.4E-04 [b]	0.014 [c]
	Chromium VI	18540-29-9	--				6.8E-05 [d]	6.8E-06 [e]	7.1E-04 [f]
	Aluminum & Compounds	7429-90-5	2.50 [1]				1.4E-03 [a]	1.4E-04 [b]	0.014 [c]
	Fluoride	FLUORIDES	2.50 [1]				1.4E-03 [a]	1.4E-04 [b]	0.014 [c]
	Nickel	7440-02-0	0.25 [1]				1.4E-04 [a]	1.4E-05 [b]	1.4E-03 [c]
LIN 309L, 332BLUE	Manganese	7439-96-5	3.00 [1]	8.00	1.00	19.0	1.3E-03 [a]	1.6E-04 [b]	3.1E-03 [c]
	Chromium	7440-47-3	27.5 [1]				0.012 [a]	1.5E-03 [b]	0.029 [c]
	Chromium VI	18540-29-9	--				6.0E-04 [d]	7.5E-05 [e]	1.4E-03 [f]
	Nickel	7440-02-0	11.5 [1]				5.0E-03 [a]	6.3E-04 [b]	0.012 [c]
	Fluoride	FLUORIDES	1.00 [1]				4.4E-04 [a]	5.5E-05 [b]	1.0E-03 [c]
	Cobalt	7440-48-4	0.25 [1]				1.1E-04 [a]	1.4E-05 [b]	2.6E-04 [c]
LIN 6010, 18	Manganese	7439-96-5	0.50 [1]	10.0	1.00	115	2.9E-04 [g]	2.9E-05 [h]	3.3E-03 [i]
LIN 6010-18PLUS	Manganese	7439-96-5	1.00 [1]	50.0	1.00	58.0	2.7E-03 [a]	5.5E-05 [b]	3.2E-03 [c]
LIN 7018, 18E	Manganese	7439-96-5	2.50 [1]	900	5.00	1,035	0.13 [g]	7.2E-04 [h]	0.15 [i]
	Fluoride	FLUORIDES	2.50 [1]				0.13 [g]	7.2E-04 [h]	0.15 [i]
LIN 7018, 332E	Manganese	7439-96-5	1.00 [1]	250	2.00	288	0.014 [g]	1.1E-04 [h]	0.017 [i]
	Fluoride	FLUORIDES	2.50 [1]				0.036 [g]	2.9E-04 [h]	0.041 [i]
LIN 7018, 532E	Manganese	7439-96-5	1.00 [1]	100.0	1.00	230	5.7E-03 [g]	5.7E-05 [h]	0.013 [i]
	Fluoride	FLUORIDES	2.50 [1]				0.014 [g]	1.4E-04 [h]	0.033 [i]
	Aluminum & Compounds	7429-90-5	0 [1]				0 [g]	0 [h]	0 [i]
	Zinc	1314-13-2	0 [1]				0 [g]	0 [h]	0 [i]
LIO 111K3M-H-045	Manganese	7439-96-5	1.00 [1]	33.0	1.00	114	1.8E-03 [a]	5.5E-05 [b]	6.2E-03 [c]
	Copper	7440-50-8	0.25 [1]				4.5E-04 [a]	1.4E-05 [b]	1.6E-03 [c]
	Aluminum & Compounds	7429-90-5	0.25 [1]				4.5E-04 [a]	1.4E-05 [b]	1.6E-03 [c]
SEL 720-045-13	Manganese	7439-96-5	2.50 [1]	165	1.00	228	0.024 [g]	1.4E-04 [h]	0.033 [i]
	Zinc	1314-13-2	0.25 [1]				2.4E-03 [g]	1.4E-05 [h]	3.3E-03 [i]
	Aluminum & Compounds	7429-90-5	1.00 [1]				9.5E-03 [g]	5.7E-05 [h]	0.013 [i]
WIR E7056-035	Manganese	7439-96-5	2.50 [1]	99.0	1.00	190	0.014 [g]	1.4E-04 [h]	0.027 [i]
	Zinc	1314-13-2	0.25 [1]				1.4E-03 [g]	1.4E-05 [h]	2.7E-03 [i]
	Aluminum & Compounds	7429-90-5	1.00 [1]				5.7E-03 [g]	5.7E-05 [h]	0.011 [i]
WIR E7056-045	Manganese	7439-96-5	2.50 [1]	66.0	1.00	76.0	9.5E-03 [g]	1.4E-04 [h]	0.011 [i]
	Zinc	1314-13-2	0.25 [1]				9.5E-04 [g]	1.4E-05 [h]	1.1E-03 [i]
	Aluminum & Compounds	7429-90-5	1.00 [1]				3.8E-03 [g]	5.7E-05 [h]	4.4E-03 [i]
Total By Toxic Air Contaminant									
Total	Aluminum	7429-90-5	93.5	[9]	18.0 [10]	[9]	1.04 [9]	0.092 [b]	1.52 [9]
	Chromium	7440-47-3	27.5				-- [9]	-- [b]	-- [9]
	Chromium VI	18540-29-9	--				6.7E-04 [9]	1.4E-03 [e]	2.1E-03 [9]
	Cobalt	7440-48-4	0.25				1.1E-04 [9]	2.5E-04 [b]	2.6E-04 [9]
	Zinc	1314-13-2	0.25				4.7E-03 [9]	2.5E-04 [b]	7.1E-03 [9]
	Copper	7440-50-8	0.25				4.5E-04 [9]	2.5E-04 [b]	1.6E-03 [9]
	Manganese	7439-96-5	3.00				0.21 [9]	3.0E-03 [b]	0.29 [9]
	Nickel	7440-02-0	11.5				5.2E-03 [9]	0.011 [b]	0.013 [9]
	Fluorides	FLUORIDES	2.50				0.18 [9]	2.5E-03 [b]	0.24 [9]

NOTES:

(a) 2019 Annual emissions estimate (lb/yr) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (weight percentage [%]/100) x (2019 annual usage [lb/yr])
Fume generation rate (lb fume/lb wire) = 0.010 (3)
Fume correction factor = 0.5464 (4)

(b) Maximum daily emissions estimate (lb/yr) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (weight percentage [%]/100) x (maximum daily usage [lb/day])
Fume generation rate (lb fume/lb wire) = 0.010 (3)
Fume correction factor = 0.5464 (4)

(c) PTE Annual emissions estimate (lb/yr) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (weight percentage [%]/100) x (PTE annual usage [lb/yr])
Fume generation rate (lb fume/lb wire) = 0.010 (3)
Fume correction factor = 0.5464 (4)

(d) 2019 annual emissions estimate (lb/yr) = (2019 annual chromium emission rate[lb/yr]) x (hexavalent chromium conversion rate [%]/100)
Hexavalent chromium conversion rate (%) = 5.00 (5)

(e) Maximum daily emissions estimate (lb/day) = (maximum daily chromium emission rate[lb/day]) x (hexavalent chromium conversion rate [%]/100)
Hexavalent chromium conversion rate (%) = 5.00 (5)

(f) PTE annual emissions estimate (lb/yr) = (PTE annual chromium emission rate[lb/yr]) x (hexavalent chromium conversion rate [%]/100)
Hexavalent chromium conversion rate (%) = 5.00 (5)

(g) 2019 Annual emissions estimate (lb/yr) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (weight percentage [%]/100) x (2019 annual usage [lb/yr])
Fume generation rate (lb fume/lb wire) = 0.020 (6)
Fume correction factor = 0.2865 (7)

(h) Maximum daily emissions estimate (lb/yr) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (weight percentage [%]/100) x (maximum daily usage [lb/day])
Fume generation rate (lb fume/lb wire) = 0.020 (6)
Fume correction factor = 0.2865 (7)

(i) PTE Annual emissions estimate (lb/yr) = (fume generation rate [lb fume/lb wire]) x (fume correction factor) x (weight percentage [%]/100) x (PTE annual usage [lb/yr])
Fume generation rate (lb fume/lb wire) = 0.020 (6)
Fume correction factor = 0.2865 (7)

REFERENCES:

(1) Information from product safety data sheets.
(2) See Table 1, Input Process Rates and Parameters.
(3) San Diego County Air Pollution Control District, Welding Operations, dated October 16, 1998. Based on American Welding Society information and the National Steel and Shipbuilding Company (NASSCO) research. Assumes tungsten inert gas (TIG) welding fume generation rate.
(4) San Diego County Air Pollution Control District, Welding Operations, dated October 16, 1998. Based on American Welding Society information and the National Steel and Shipbuilding Company (NASSCO) research.
(5) San Diego County Air Pollution Control District, Welding Operations, dated October 16, 1998. Based on American Welding Society information and the National Steel and Shipbuilding Company (NASSCO) research. Hexavalent chromium accounts for 5 % of total chromium emissions.
(6) San Diego County Air Pollution Control District, Welding Operations, dated October 16, 1998. Based on American Welding Society information and the National Steel and Shipbuilding Company (NASSCO) research. Assumes shield metal arc welding (SMAW) fume generation rate.
(7) San Diego County Air Pollution Control District, Welding Operations, dated October 16, 1998. Based on American Welding Society information and the National Steel and Shipbuilding Company (NASSCO) research. Assumes shield metal arc welding (SMAW) fume generation rate.
(8) Information from product safety data sheets. Value represents maximum percentage in all wires used at the Forest Grove Complex.
(9) Total annual emission estimates are the sum of individual product annual emission estimates.
(10) See Table 1, Input Process Rates and Parameters. Value represents total product usage excluding waste.

Table 24
Babbit Pot - TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Product	Toxic Air Contaminant [1]	CAS/DEQ ID	Weight Percentage [1] (%)	Usage [2]			Total Emissions Estimate		
				2019 Annual (lb/yr)	Maximum Daily (lb/day)	PTE Annual (lb/yr)	2019 Annual [a] (lb/yr)	Maximum Daily [b] (lb/day)	PTE Annual [c] (lb/yr)
Individual Products									
Babbitt Pot #1	Nickel	7440-02-0	0.50	315	20.0	480	7.1E-04	4.5E-05	1.1E-03
	Copper	7440-50-8	5.00				7.1E-03	4.5E-04	0.011
	Antimony	7440-36-0	5.00				7.1E-03	4.5E-04	0.011
Babbitt Pot #2	Nickel	7440-02-0	0.50	390	10.0	520	8.8E-04	2.3E-05	1.2E-03
	Copper	7440-50-8	5.00				8.8E-03	2.3E-04	0.012
	Antimony	7440-36-0	5.00				8.8E-03	2.3E-04	0.012
Total	Nickel	7440-02-0	--				**1.6E-03**	**6.8E-05**	**2.3E-03**
	Copper	7440-50-8	--				**0.016**	**6.8E-04**	**0.023**
	Antimony	7440-36-0	--				**0.016**	**6.8E-04**	**0.023**

NOTES:

(a) 2019 Annual emissions estimate (lb/yr) = (2019 annual usage [lb/yr]) / (2,000 lb/ton) x (PM emission factor [lb PM/ton metal melted]) x (weight percentage [%]/100)
PM emission factor (lb PM/ton metal poured) = 0.90 (3)

(b) Maximum daily emissions estimate (lb/yr) = (maximum daily usage [lb/day]) / (2,000 lb/ton) x (PM emission factor [lb PM/ton metal melted]) x (weight percentage [%]/100)
PM emission factor (lb PM/ton metal poured) = 0.90 (3)

(c) PTE Annual emissions estimate (lb/yr) = (PTE annual usage [lb/yr]) / (2,000 lb/ton) x (PM emission factor [lb PM/ton metal melted]) x (weight percentage [%]/100)
PM emission factor (lb PM/ton metal poured) = 0.90 (3)

REFERENCES:

(1) Information provided by Stimson Lumber Company. Based on engineering judgement.
(2) See Table 1, Input Process Rates and Parameters.
(3) AP-42, Chapter 12.10, Table 12.10-3 "Particulate Emission Factors for Iron Furnaces". Uncontrolled particulate emission factor for melting in an electric induction furnace.

Table 25
Chipper Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor [1] (lb/ODT)	2019 Emission Estimates		PTE Emission Estimates	
					Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Methanol	67-56-1	Yes	288	1.0E-03	0.34	48.7	0.34	63.7
Total TAC Emissions Estimate					**0.34**	**48.7**	**0.34**	**63.7**
Total HAP Emissions Estimate					**0.34**	**48.7**	**0.34**	**63.7**

Notes:

(a) Daily emissions estimate (lb/day) = (emissions factor [lb/ODT]) x (maximum daily throughput [ODT/day])

Maximum daily throughput (ODT/day) = 340 (2)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/ODT]) x (annual throughput [ODT/yr])

2019 annual throughput (ODT/yr) = 48,721 (2)

PTE annual throughput (ODT/yr) = 63,720 (2)

References:

(1) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of whole log chipper.

(2) See Table 1, Input Process Rates and Parameters.

Table 26
Emergency Firepump (Diesel-Fired) Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Emergency Generator (Diesel Fuel)	
		2019	PTE
Maximum Daily Fuel Usage (gal/day)	(1)	14.4	14.4
Annual Fuel Usage (Mgal/yr)	(1)	0.21	0.72
Maximum Daily Hours of Operation (hrs/day)	(1)	2.00	2.00
Annual Hours of Operation (hrs/yr)	(1)	28.5	100
Engine Size (kW)	(2)	135	

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Emission Factor(2)		2019 Emissions Estimates		PTE Emissions Estimates	
						Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
SPECIATED ORGANIC/INORGANIC COMPOUNDS									
Acetaldehyde	75-07-0	Yes	1	0.78	(lb/Mgal)	0.011 (a)	0.16 (b)	0.011 (a)	0.56 (b)
Acrolein	107-02-8	Yes	6	0.034	(lb/Mgal)	4.9E-04 (a)	7.0E-03 (b)	4.9E-04 (a)	0.024 (b)
Ammonia	7664-41-7	No	25	2.90	(lb/Mgal)	0.042 (a)	0.60 (b)	0.042 (a)	2.09 (b)
Benzene	71-43-2	Yes	44	0.19	(lb/Mgal)	2.7E-03 (a)	0.038 (b)	2.7E-03 (a)	0.13 (b)
1,3-Butadiene	106-99-0	Yes	67	0.22	(lb/Mgal)	3.1E-03 (a)	0.045 (b)	3.1E-03 (a)	0.16 (b)
Ethylbenzene	100-41-4	Yes	221	0.011	(lb/Mgal)	1.6E-04 (a)	2.2E-03 (b)	1.6E-04 (a)	7.9E-03 (b)
Formaldehyde	50-00-0	Yes	240	1.73	(lb/Mgal)	0.025 (a)	0.35 (b)	0.025 (a)	1.24 (b)
Hexane	110-54-3	Yes	262	0.027	(lb/Mgal)	3.9E-04 (a)	5.5E-03 (b)	3.9E-04 (a)	0.019 (b)
Hydrochloric acid	7647-01-0	Yes	265	0.19	(lb/Mgal)	2.7E-03 (a)	0.038 (b)	2.7E-03 (a)	0.13 (b)
Toluene	108-88-3	Yes	555	0.11	(lb/Mgal)	1.5E-03 (a)	0.022 (b)	1.5E-03 (a)	0.076 (b)
Xylene (mixture)	1330-20-7	Yes	602	0.042	(lb/Mgal)	6.1E-04 (a)	8.7E-03 (b)	6.1E-04 (a)	0.031 (b)
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)									
PAHs (excluding Naphthalene)	PAHs	Yes	457	0.036	(lb/Mgal)	5.2E-04 (a)	7.4E-03 (b)	5.2E-04 (a)	0.026 (b)
Benzo(a)pyrene	50-32-8	Yes	463	3.5E-05	(lb/Mgal)	5.1E-07 (a)	7.3E-06 (b)	5.1E-07 (a)	2.6E-05 (b)
Naphthalene	91-20-3	Yes	320	0.020	(lb/Mgal)	2.8E-04 (a)	4.0E-03 (b)	2.8E-04 (a)	0.014 (b)
METALS									
Arsenic	7440-38-2	Yes	35	1.6E-03	(lb/Mgal)	2.3E-05 (a)	3.3E-04 (b)	2.3E-05 (a)	1.2E-03 (b)
Cadmium	7440-43-9	Yes	77	1.5E-03	(lb/Mgal)	2.2E-05 (a)	3.1E-04 (b)	2.2E-05 (a)	1.1E-03 (b)
Chromium VI	18540-29-9	Yes	119	1.0E-04	(lb/Mgal)	1.4E-06 (a)	2.1E-05 (b)	1.4E-06 (a)	7.2E-05 (b)
Copper	7440-50-8	No	125	4.1E-03	(lb/Mgal)	5.9E-05 (a)	8.4E-04 (b)	5.9E-05 (a)	3.0E-03 (b)
Lead	7439-92-1	Yes	278	8.3E-03	(lb/Mgal)	1.2E-04 (a)	1.7E-03 (b)	1.2E-04 (a)	6.0E-03 (b)
Manganese	7439-96-5	Yes	281	3.1E-03	(lb/Mgal)	4.5E-05 (a)	6.4E-04 (b)	4.5E-05 (a)	2.2E-03 (b)
Mercury	7439-97-6	Yes	284	2.0E-03	(lb/Mgal)	2.9E-05 (a)	4.1E-04 (b)	2.9E-05 (a)	1.4E-03 (b)
Nickel	7440-02-0	Yes	321	3.9E-03	(lb/Mgal)	5.6E-05 (a)	8.0E-04 (b)	5.6E-05 (a)	2.8E-03 (b)
Selenium	7782-49-2	Yes	528	2.2E-03	(lb/Mgal)	3.2E-05 (a)	4.5E-04 (b)	3.2E-05 (a)	1.6E-03 (b)
DIESEL PARTICULATE MATTER (DPM)									
DPM From Normal Operation	DPM	No	179	*1.50*	*(g/kW-hr)* (c)	*0.89* (d)	*12.7* (e)	*0.89* (d)	*44.6* (e)
Total TAC Emission Estimates						**0.98**	**14.0**	**0.98**	**49.2**
Total HAP Emission Estimates						**0.049**	**0.70**	**0.049**	**2.45**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (daily fuel usage [gal/day]) x (Mgal/1,000 gal)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/Mgal]) x (annual fuel usage [Mgal/yr])

(c) DPM emission facotr (g/kW-hr)= (PM emission factor [g/kW-hr]) + (HC emission factor [g/kW-hr])

PM emission factor (g/kW-hr)= 0.20 (4)

NMHC emission factor (g/kW-hr)= 1.3 (5)

(d) Daily emissions estimate (lb/day) = (emission factor [g/kW-hr]) x (engine size [kW]) / (453.592 g/lb) x (daily hours of operation [hrs/day])

(e) Annual emissions estimate (lb/yr) = (emission factor [g/kW-hr]) x (engine size [kW]) / (453.592 g/lb) x (annual hours of operation [hrs/yr])

REFERENCES:

(1) See Table 2, Miscellaneous Input Assumptions and Parameters.

(2) Information provided by Stimson Lumber Company.

(3) Emission factors based on the Oregon Department of Environmental Quality approved list of TAC emissions for diesel and distillate combustion. Emission factor representative of stationary and protable internal combustion engines.

(4) USEPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards (EPA-420-B-16-022) dated March 2016. Assumes Tier 3 emission factor PM.

(5) USEPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards (EPA-420-B-16-022) dated March 2016. Assumes Tier 1 emission factor NMHC.

Table 27
Backup Emergency Generator Engine (Diesel-Fired) Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Emergency Generator (Diesel Fuel)	
		2019	PTE
Maximum Daily Fuel Usage (gal/day)	(1)	81.7	81.7
Annual Fuel Usage (Mgal/yr)	(1)	0.65	4.08
Maximum Daily Hours of Operation (hrs/day)	(1)	2.00	2.00
Annual Hours of Operation (hrs/yr)	(1)	15.9	100
Engine Size (hp)	(2)	805	

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Emission Factor[3]		2019 Emissions Estimates Daily (lb/day)	2019 Emissions Estimates Annual (lb/yr)	PTE Emissions Estimates Daily (lb/day)	PTE Emissions Estimates Annual (lb/yr)
SPECIATED ORGANIC/INORGANIC COMPOUNDS									
Acetaldehyde	75-07-0	Yes	1	0.78	(lb/Mgal)	0.064 (a)	0.51 (b)	0.064 (a)	3.20 (b)
Acrolein	107-02-8	Yes	6	0.034	(lb/Mgal)	2.8E-03 (a)	0.022 (b)	2.8E-03 (a)	0.14 (b)
Ammonia	7664-41-7	No	25	2.90	(lb/Mgal)	0.24 (a)	1.88 (b)	0.24 (a)	11.8 (b)
Benzene	71-43-2	Yes	44	0.19	(lb/Mgal)	0.015 (a)	0.12 (b)	0.015 (a)	0.76 (b)
1,3-Butadiene	106-99-0	Yes	67	0.22	(lb/Mgal)	0.018 (a)	0.14 (b)	0.018 (a)	0.89 (b)
Ethylbenzene	100-41-4	Yes	221	0.011	(lb/Mgal)	8.9E-04 (a)	7.1E-03 (b)	8.9E-04 (a)	0.045 (b)
Formaldehyde	50-00-0	Yes	240	1.73	(lb/Mgal)	0.14 (a)	1.12 (b)	0.14 (a)	7.05 (b)
Hexane	110-54-3	Yes	262	0.027	(lb/Mgal)	2.2E-03 (a)	0.017 (b)	2.2E-03 (a)	0.11 (b)
Hydrochloric acid	7647-01-0	Yes	265	0.19	(lb/Mgal)	0.015 (a)	0.12 (b)	0.015 (a)	0.76 (b)
Toluene	108-88-3	Yes	555	0.11	(lb/Mgal)	8.6E-03 (a)	0.068 (b)	8.6E-03 (a)	0.43 (b)
Xylene (mixture)	1330-20-7	Yes	602	0.042	(lb/Mgal)	3.5E-03 (a)	0.028 (b)	3.5E-03 (a)	0.17 (b)
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)									
PAHs (excluding Naphthalene)	PAHs	Yes	457	0.036	(lb/Mgal)	3.0E-03 (a)	0.024 (b)	3.0E-03 (a)	0.15 (b)
Benzo(a)pyrene	50-32-8	Yes	463	3.5E-05	(lb/Mgal)	2.9E-06 (a)	2.3E-05 (b)	2.9E-06 (a)	1.4E-04 (b)
Naphthalene	91-20-3	Yes	320	0.020	(lb/Mgal)	1.6E-03 (a)	0.013 (b)	1.6E-03 (a)	0.080 (b)
METALS									
Arsenic	7440-38-2	Yes	35	1.6E-03	(lb/Mgal)	1.3E-04 (a)	1.0E-03 (b)	1.3E-04 (a)	6.5E-03 (b)
Cadmium	7440-43-9	Yes	77	1.5E-03	(lb/Mgal)	1.2E-04 (a)	9.7E-04 (b)	1.2E-04 (a)	6.1E-03 (b)
Chromium VI	18540-29-9	Yes	119	1.0E-04	(lb/Mgal)	8.2E-06 (a)	6.5E-05 (b)	8.2E-06 (a)	4.1E-04 (b)
Copper	7440-50-8	No	125	4.1E-03	(lb/Mgal)	3.3E-04 (a)	2.7E-03 (b)	3.3E-04 (a)	0.017 (b)
Lead	7439-92-1	Yes	278	8.3E-03	(lb/Mgal)	6.8E-04 (a)	5.4E-03 (b)	6.8E-04 (a)	0.034 (b)
Manganese	7439-96-5	Yes	281	3.1E-03	(lb/Mgal)	2.5E-04 (a)	2.0E-03 (b)	2.5E-04 (a)	0.013 (b)
Mercury	7439-97-6	Yes	284	2.0E-03	(lb/Mgal)	1.6E-04 (a)	1.3E-03 (b)	1.6E-04 (a)	8.2E-03 (b)
Nickel	7440-02-0	Yes	321	3.9E-03	(lb/Mgal)	3.2E-04 (a)	2.5E-03 (b)	3.2E-04 (a)	0.016 (b)
Selenium	7782-49-2	Yes	528	2.2E-03	(lb/Mgal)	1.8E-04 (a)	1.4E-03 (b)	1.8E-04 (a)	9.0E-03 (b)
DIESEL PARTICULATE MATTER (DPM)									
Normal Operation	DPM	No	179	*0.34*	*(lb/hr)* (c)	*0.67* (d)	*5.34* (e)	*0.67* (d)	*33.6* (e)
Total TAC Emission Estimates						**1.19**	**9.43**	**1.19**	**59.3**
Total HAP Emission Estimates						**0.28**	**2.21**	**0.28**	**13.9**

Notes:

(a) Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (daily fuel usage [gal/day]) x (Mgal/1,000 gal)

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/Mgal]) x (annual fuel usage [Mgal/yr])

(c) DPM emission rate (lb/hr) = ([PM emission rate {lb/hr}] + [THC emission rate {lb/hr}])
Uncontrolled Hourly PM emission rate (lb/hr) = 0.24 (4)
Controlled Hourly THC emission rate (lb/hr) = 0.096 (4)

(d) Daily emissions estimate (lb/day) = (emission rate [lb/hr]) x (daily hours of operation [hr/day])

(e) Annual emissions estimate (lb/yr) = (emission rate [lb/hr]) x (annual hours of operation [hr/yr])

REFERENCES:

(1) See Table 2, Miscellaneous Input Assumptions and Parameters.

(2) Information provided by Stimson Lumber Company.

(3) Emission factors based on the Oregon Department of Environmental Quality approved list of TAC emissions for diesel and distillate combustion. Emission factor representative of stationary and protable internal combustion engines.

(4) Emission rates from engine manufacturer and provided with emergency generator application submitted to DEQ in June, 2003. Emission rates represent 52% control by the catalytic converter for THC, respectively. Control efficiencies estimated by catalytic converter manufacturer.

Table 28
Diesel Storage Tank (D1) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		(Units)	Storage Tank D1 (Diesel)		AP-42 Variable
			2019 Actual	Requested PTE	
PRODUCTION VALUES					
Storage Tank ID	(1)	--	D1		--
Total Annual Throughput	(1)	(gal/yr)	88,505	116,000	--
Total Annual Throughput	(c)	(bbl/yr)	2,107	2,762	Q
Maximum Daily Throughput	(1)	(gal/day)	7,604	7,604	--
Maximum Daily Throughput	(c)	(bbl/day)	181	181	--
Annual Days of Operation	(2)	(days/yr)	200	365	--
TANK PROPERTIES					
Tank Type (Fixed Roof or Internal Floating Roof Tank)	(1)	--	Fixed-Roof		--
Heated or Not Heated?	(1)	--	Not Heated		--
Controlled or Fugitive?	(1)	--	Fugitive		--
Control Efficiency		(%)	0		--
Tank Roof Color	(1)	--	Aluminum-Diffuse		--
Tank Roof Condition	(1)	--	Average		--
Tank Shell Color	(1)	--	Aluminum-Diffuse		--
Tank Shell Condition	(1)	--	Average		--
Horizontal or Vertical	(1)	--	Horizontal		--
Tank Diameter	(1)	(ft)	9.00		D
Tank Shell Height or Length of Horizontal Tank	(1)	(ft)	25.9		H_S
Roof Type	(3)	--	Cone		--
Maximum Liquid Height	(1)	(ft)	7.07		H_{LX}
Minimum Liquid Height	(4)	(ft)	0		H_{LN}
TANK CONTENT PROPERTIES					
Average Daily Liquid Surface Temperature	(b)	(°R)	518		T_{LA}
Maximum Liquid Surface Temperature	(5)	(°R)	555		T_{MAX}
Average Daily Maximum Liquid Temperature	(c)	(°R)	527		T_{LX}
Average Daily Minimum Liquid Temperature	(d)	(°R)	510		T_{LN}
Liquid Molecular Weight	(8)	(lb/lb-mole)	188		M_L
Vapor Molecular Weight	(8)	(lb/lb-mole)	130		M_V
Vapor Pressure Equation Constant A	(8)	--	12.101		A
Vapor Pressure Equation Constant B	(8)	(°R)	8,907		B
True Vapor Pressure	(e)	(psia)	6.2E-03		P_{VA}
Daily Maximum Vapor Pressure	(e)	(psia)	1.9E-02		P_{VA}
ENVIRONMENTAL FACTORS					
Average Daily Maximum Ambient Temperature	(6)	(°R)	528		T_{AX}
Average Daily Minimum Ambient Temperature	(6)	(°R)	499		T_{AN}
Average Daily Total Insolation on a Horizontal Surface	(7)	(Btu/ft^2-day)	1,145		I
CALCUALTED VARIABLES					
Standing Loss Calculations					
Average Daily Ambient Temperature Range	(f)	(°R)	29.00		ΔT_A
Tank Roof Surface Solar Absorptance	(11)	--	0.64		α_R
Tank Shell Surface Solar Absorptance	(11)	--	0.64		α_S
Average Tank Surface Solar Absorptance	(g)	--	0.64		α
Average Daily Vapor Temperature Range	(h)	(°R)	35.0		ΔT_V
Vapor Space Expansion Factor	(i)	--	0.063		K_E
Effective Tank Diameter (If Horizontal Tank)	(j)	(ft)	17.2		D_E
Liquid Height	(14)	(ft)	13.0		H_L
Tank Shell Radius	(1)	(ft)	4.50		R_S
Tank Roof Height	(15)	(ft)	0.28		H_R
Roof Outage	(16)	(ft)	0.094		H_{RO}
Vapor Space Outage	(k)	(ft)	3.53		H_{VO}
Vented Vapor Saturation Factor	(l)	--	1.00		K_S
Average Daily Ambient Temperature	(m)	(°R)	514		T_{AA}
Liquid Bulk Temperature	(n)	(°R)	516		T_B
Average Daily Liquid Surface Temperature	(o)	(°R)	518		T_{LA}
Average Vapor Temperature	(p)	(°R)	519		T_V
Stock Vapor Density	(q)	(lb/ft^3)	1.5E-04		W_V
Annual Standing Loss	(r)	(lb/yr)	2.75		L_S
Daily Standing Loss	(s)	(lb/day)	7.5E-03		--
Working Loss Calculations					
Annual Net Working Loss Throughput	(t)	(ft^3/yr)	11,830	15,505	V_Q
Annual Sum of the Increase is Liquid Level	(u)	(ft/yr)	50.8	66.5	ΣH_{QI}
Number of Turnovers per Year	(v)	--	7.18	9.4	N
Working Loss Turnover (Saturation) Factor per Year	(w)	--	1.00	1.00	K_N
Daily Net Working Loss Throughput	(t)	(ft^3/day)	1,016	1,016	V_Q
Daily Sum of the Increase is Liquid Level	(u)	(ft/day)	16.0	16.0	ΣH_{QI}
Number of Turnovers per Day	(v)	--	2.26	2.26	N
Working Loss Turnover (Saturation) Factor per Day	(w)	--	1.00	1.00	K_N
Working Loss Product Factor	(29)	--	1.00	1.00	K_P
Vent Setting Correction Factor	(28)	--	1.00	1.00	K_B
Annual Working Loss	(x)	(lb/yr)	1.72	2.26	L_W
Daily Working Loss	(y)	(lb/day)	0.42	0.42	--
Annual Total Tank Routine Losses	**(z)**	**(lb/yr)**	**4.47**	**5.01**	**L_T**
Daily Total Tank Routine Losses	**(z)**	**(lb/day)**	**0.43**	**0.43**	**--**

All notes and references are provided on the following page. See Table 28 (Continued), Diesel Storage Tank (D1) TAC Emission Estimates.

Table 28 (Continued)
Diesel Storage Tank (D1) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	DEQ Sequence Number	Regulatory Category (Yes/No)			Physical Characteristics			EPA Tanks Methodology (Annual Calculations)				EPA Tanks Methodology (Daily Calculations)				Emissions Estimate			
						Z_{li}	M_{li}	x_i	P	P_i	y_i	Z_{Vi}	P	P_i	y_i	Z_{Vi}	L_{Ti} (2019 Actual)		L_{Ti} (Requested PTE)	
			TAC	HAP	RBC	Liquid Weight Fraction	Molecular Weight (lb/lb-mol)	Liquid Mole Fraction	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Maximum Daily (lb/day)	Annual (lb/yr)	Maximum Daily (lb/day)	Annual (lb/yr)
Benzene	71-43-2	46	Yes	Yes	Yes	7.9E-05 [32]	78.1 [33]	1.9E-04 [l]	1.14 [35]	2.2E-04 [l]	3.5E-02 [l]	2.1E-02 [-]	2.87 [35]	5.5E-04 [l]	2.8E-02 [l]	1.7E-02 [l]	7.4E-03 [aa]	9.3E-02 [aa]	7.4E-03 [aa]	0.10 [aa]
Toluene	108-88-3	600	Yes	Yes	Yes	2.8E-04 [32]	92.1 [33]	5.7E-04 [l]	0.32 [35]	1.8E-04 [l]	3.0E-02 [l]	2.1E-02 [-]	0.90 [35]	5.2E-04 [l]	2.7E-02 [l]	1.9E-02 [l]	8.3E-03 [aa]	9.4E-02 [aa]	8.3E-03 [aa]	0.10 [aa]
Ethylbenzene	100-41-4	229	Yes	Yes	Yes	1.5E-04 [32]	106 [33]	2.6E-04 [l]	0.10 [35]	2.6E-05 [l]	4.2E-03 [l]	3.4E-03 [-]	0.32 [35]	8.3E-05 [l]	4.3E-03 [l]	3.5E-03 [l]	1.5E-03 [aa]	1.5E-02 [aa]	1.5E-03 [aa]	1.7E-02 [aa]
p-Xylene, m-xylene	106-42-3	631	Yes	Yes	Yes	4.9E-04 [32]	106 [33]	8.8E-04 [l]	9.4E-02 [35]	8.3E-05 [l]	1.3E-02 [l]	1.1E-02 [-]	0.30 [35]	2.6E-04 [l]	1.4E-02 [l]	1.1E-02 [l]	4.8E-03 [aa]	4.8E-02 [aa]	4.8E-03 [aa]	5.4E-02 [aa]
o-Xylene	95-47-6	630	Yes	Yes	Yes	2.2E-04 [32]	106 [33]	3.9E-04 [l]	6.9E-02 [35]	2.7E-05 [l]	4.3E-03 [l]	3.5E-03 [-]	0.23 [35]	8.7E-05 [l]	4.6E-03 [l]	3.7E-03 [l]	1.6E-03 [aa]	1.6E-02 [aa]	1.6E-03 [aa]	1.7E-02 [aa]
Isopropylbenzene (Cumene)	98-82-8	157	Yes	Yes	Yes	5.2E-05 [32]	120 [33]	8.1E-05 [l]	4.6E-02 [35]	3.7E-06 [l]	6.0E-04 [l]	5.6E-04 [-]	0.16 [35]	1.3E-05 [l]	6.8E-04 [l]	6.3E-04 [l]	2.7E-04 [aa]	2.5E-03 [aa]	2.7E-04 [aa]	2.8E-03 [aa]
n-Propylbenzene	103-65-1	--	No	No	No	1.4E-04 [32]	120 [33]	2.1E-04 [l]	3.4E-02 [35]	7.1E-06 [l]	1.1E-03 [l]	1.1E-03 [-]	0.12 [35]	2.5E-05 [l]	1.3E-03 [l]	1.2E-03 [l]	--	--	--	--
p-Isopropyltoluene	99-87-6	--	No	No	No	1.3E-04 [32]	134 [33]	1.8E-04 [l]	1.4E-02 [35]	2.6E-06 [l]	4.1E-04 [l]	4.2E-04 [-]	5.4E-02 [35]	1.0E-05 [l]	5.2E-04 [l]	5.4E-04 [l]	--	--	--	--
4-Ethyltoluene	622-96-8	--	No	No	No	4.7E-04 [32]	120 [33]	7.4E-04 [l]	2.9E-02 [35]	2.2E-05 [l]	3.5E-03 [l]	3.2E-03 [-]	0.11 [35]	7.8E-05 [l]	4.1E-03 [l]	3.8E-03 [l]	--	--	--	--
2-Ethyltoluene	611-14-3	--	No	No	No	2.3E-04 [32]	120 [33]	3.6E-04 [l]	2.4E-02 [35]	8.7E-06 [l]	1.4E-03 [l]	1.3E-03 [-]	9.0E-02 [35]	3.2E-05 [l]	1.7E-03 [l]	1.6E-03 [l]	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	615	Yes	No	Yes	2.4E-04 [32]	120 [33]	3.7E-04 [l]	2.4E-02 [35]	8.8E-06 [l]	1.4E-03 [l]	1.3E-03 [-]	8.8E-02 [35]	3.3E-05 [l]	1.7E-03 [l]	1.6E-03 [l]	6.8E-04 [aa]	5.8E-03 [aa]	6.8E-04 [aa]	6.5E-03 [aa]
1,2,4-Trimethylbenzene	95-63-6	614	Yes	No	Yes	8.5E-04 [32]	120 [33]	1.3E-03 [l]	2.0E-02 [35]	2.6E-05 [l]	4.2E-03 [l]	3.9E-03 [-]	7.4E-02 [35]	9.8E-05 [l]	5.1E-03 [l]	4.8E-03 [l]	2.1E-03 [aa]	1.7E-02 [aa]	2.1E-03 [aa]	1.9E-02 [aa]
1,2,3-Trimethylbenzene	526-73-8	613	Yes	No	Yes	2.5E-03 [32]	120 [33]	3.9E-03 [l]	1.4E-02 [35]	5.5E-05 [l]	8.9E-03 [l]	8.2E-03 [-]	5.5E-02 [35]	2.2E-04 [l]	1.1E-02 [l]	1.0E-02 [l]	4.5E-03 [aa]	3.7E-02 [aa]	4.5E-03 [aa]	4.1E-02 [aa]
sec-Butylbenzene	135-98-8	--	No	No	No	1.1E-04 [32]	134 [33]	1.5E-04 [l]	1.7E-02 [35]	2.6E-06 [l]	4.2E-04 [l]	4.3E-04 [-]	6.6E-02 [35]	9.9E-06 [l]	5.2E-04 [l]	5.3E-04 [l]	--	--	--	--
n-Butylbenzene	104-51-8	--	No	No	No	4.4E-04 [32]	134 [33]	6.2E-04 [l]	9.5E-03 [35]	5.9E-06 [l]	9.4E-04 [l]	9.8E-04 [-]	3.9E-02 [35]	2.4E-05 [l]	1.3E-03 [l]	1.3E-03 [l]	--	--	--	--
Styrene	100-42-5	585	Yes	Yes	Yes	2.4E-08 [32]	104 [33]	4.3E-08 [l]	6.3E-02 [35]	2.7E-09 [l]	4.3E-07 [l]	3.5E-07 [-]	0.21 [35]	9.0E-09 [l]	4.7E-07 [l]	3.8E-07 [l]	1.6E-07 [aa]	1.6E-06 [aa]	1.6E-07 [aa]	1.7E-06 [aa]
Naphthalene	91-20-3	428	Yes	Yes	Yes	3.5E-03 [32]	128 [33]	5.2E-03 [l]	2.3E-03 [35]	1.2E-05 [l]	1.9E-03 [l]	1.9E-03 [-]	1.0E-02 [35]	5.3E-05 [l]	2.8E-03 [l]	2.7E-03 [l]	1.2E-03 [aa]	8.4E-03 [aa]	1.2E-03 [aa]	9.4E-03 [aa]
n-Heptane	142-82-5	--	No	No	No	2.0E-04 [32]	100 [33]	3.8E-04 [l]	0.53 [35]	2.0E-04 [l]	3.2E-02 [l]	2.5E-02 [-]	1.43 [35]	5.5E-04 [l]	2.9E-02 [l]	2.2E-02 [l]	--	--	--	--
n-Octane	111-65-9	--	No	No	No	5.7E-04 [32]	114 [33]	9.3E-04 [l]	0.14 [35]	1.3E-04 [l]	2.1E-02 [l]	1.8E-02 [-]	0.44 [35]	4.1E-04 [l]	2.1E-02 [l]	1.9E-02 [l]	--	--	--	--
n-Nonane	111-84-2	--	No	No	No	8.3E-03 [32]	128 [33]	1.2E-02 [l]	3.6E-02 [35]	4.4E-04 [l]	7.1E-02 [l]	7.0E-02 [-]	0.12 [35]	1.4E-03 [l]	7.4E-02 [l]	7.3E-02 [l]	--	--	--	--
n-Decane	124-18-5	--	No	No	No	9.1E-03 [32]	142 [33]	1.2E-02 [l]	1.0E-02 [35]	1.2E-04 [l]	2.0E-02 [l]	2.2E-02 [-]	2.9E-02 [35]	3.4E-04 [l]	1.8E-02 [l]	2.0E-02 [l]	--	--	--	--
n-Undecane	1120-21-4	--	No	No	No	9.1E-03 [32]	156 [33]	1.1E-02 [l]	3.3E-03 [35]	3.6E-05 [l]	5.8E-03 [l]	7.0E-03 [-]	1.6E-02 [35]	1.8E-04 [l]	9.3E-03 [l]	1.1E-02 [l]	--	--	--	--
n-Dodecane	112-40-3	--	No	No	No	9.9E-03 [32]	170 [33]	1.1E-02 [l]	8.8E-04 [35]	9.6E-06 [l]	1.5E-03 [l]	2.0E-03 [-]	5.2E-03 [35]	5.7E-05 [l]	3.0E-03 [l]	3.9E-03 [l]	--	--	--	--
n-Tridecane	629-50-5	--	No	No	No	1.6E-02 [32]	184 [33]	1.6E-02 [l]	2.3E-04 [35]	3.8E-06 [l]	6.0E-04 [l]	8.5E-04 [-]	1.7E-03 [35]	2.7E-05 [l]	1.4E-03 [l]	2.0E-03 [l]	--	--	--	--
n-Tetradecane	629-59-4	--	No	No	No	1.2E-02 [32]	198 [33]	1.1E-02 [l]	5.9E-05 [35]	6.6E-07 [l]	1.1E-04 [l]	1.6E-04 [-]	5.1E-04 [35]	5.8E-06 [l]	3.0E-04 [l]	4.6E-04 [l]	--	--	--	--
n-Pentadecane	629-62-9	--	No	No	No	1.1E-02 [32]	212 [33]	9.4E-03 [l]	1.5E-05 [35]	1.4E-07 [l]	2.2E-05 [l]	3.6E-05 [-]	1.6E-04 [35]	1.5E-06 [l]	7.7E-05 [l]	1.3E-04 [l]	--	--	--	--
n-Hexadecane	544-76-3	--	No	No	No	1.1E-02 [32]	226 [33]	9.1E-03 [l]	3.5E-06 [35]	3.2E-08 [l]	5.2E-06 [l]	9.0E-06 [-]	4.7E-05 [35]	4.3E-07 [l]	2.3E-05 [l]	3.9E-05 [l]	--	--	--	--
Cyclohexane	110-82-7	162	Yes	No	Yes	2.2E-04 [32]	84.2 [33]	5.0E-04 [l]	1.18 [35]	5.9E-04 [l]	9.5E-02 [l]	6.2E-02 [-]	2.91 [35]	1.5E-03 [l]	7.6E-02 [l]	5.0E-02 [l]	2.1E-02 [aa]	0.28 [aa]	2.1E-02 [aa]	0.31 [aa]
Methyl cyclohexane	108-87-2	--	No	No	No	5.0E-04 [32]	98.2 [33]	9.6E-04 [l]	0.54 [35]	5.2E-04 [l]	8.4E-02 [l]	6.3E-02 [-]	1.42 [35]	1.4E-03 [l]	7.1E-02 [l]	5.4E-02 [l]	--	--	--	--
Total TAC Emission Estimates																	**0.05**	**0.61**	**0.05**	**0.69**
Total HAP Emission Estimates																	**0.03**	**0.28**	**0.03**	**0.31**
Total RBC-Only Emission Estimates																	**0.05**	**0.61**	**0.05**	**0.69**
Total Non-RBC Emission Estimates																	**0**	**0**	**0**	**0**

NOTES:

(a) Total annual or daily throughput (bbl/"unit") = (total annual or daily throughput [gal/"unit"]) x (bbl/42 gal)

(b) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]); See reference (22).

(c) Average daily maximum liquid temperature (°R) = (average daily liquid surface temperature, °R) + 0.25 x (average daily vapor temperature range, °R); See reference (15).

(d) Average daily minimum liquid temperature (°R) = (average daily liquid surface temperature, °R) - 0.25 x (average daily vapor temperature range, °R); See reference (15).

(e) True vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average daily liquid surface temperature (°R)]); See reference (9).

(f) Average daily ambient temperature range (°R) = ([daily maximum ambient temperature (°R)] - [daily minimum ambient temperature (°R)]); See reference (10).

(g) Average tank surface solar absorbance = ([tank roof surface solar absorptance] + [tank shell surface solar absorptance]) / (2); See reference (11).

(h) Average daily vapor temperature range (°R) = ([0.7] x [average daily temperature range (°R)]) + ([0.02] x [average tank surface solar absorptance] x [average daily total insolation factor {Btu/ft²-d}]); See reference (12).

(i) Vapor space expansion factor = (0.0018) x (average daily vapor temperature range (°R)); See reference (13).

(j) Effective tank diameter (ft) = ([tank length (ft)] x [tank diameter (ft)] / [π/4])^(1/2); See reference (4).

(k) For Vertical Tanks: Vapor space outage (ft) = (tank shell height (ft)) - (liquid height (ft)) + (roof outage (ft)); See reference (17).
For Horizontal Tanks: Vapor space outage (ft) = (π / 8) x (tank diameter (ft)); See reference (17).

(l) Vented vapor saturation factor = (1) / ([1] + [0.053] x [vapor pressure at average daily liquid surface temperature (psia)] x [vapor space outage (ft)]); See reference (18).

(m) Average daily ambient temperature (°R) = ([average daily maximum ambient temperature (°R)] + [average daily minimum ambient temperature (°R)]) / (2); See reference (19).

(n) If non-heated tank: Liquid bulk temperature (°R) = (average daily ambient temperature [°R]) + ([0.003] x [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]); See reference (20).
For heated tanks, the setpoint temperature for the storage tank is assumed to be representative of the liquid bulk temperature.

(o) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]); See reference (21).

(p) Average vapor temperature (°R) = ([2.2 x {tank shell height |ft|} / {tank diameter |ft|} + 1.1] x [average daily ambient temperature (°R)] + [0.8 x {liquid bulk temperature |°R|}] + [0.021 x {tank roof surface solar absorptance} x {average daily total insolation factor |Btu/ft²-day|}] + [0.013 x {tank shell height |ft|} / {tank diameter |ft|} x {tank shell surface solar absorptance} x {average daily total insolation factor {|Btu/ft²-day|}}]) / (2.2 x [tank shell height {ft}] / [tank diameter {ft}] + 1.9); See reference (22).

(q) Stock vapor density (lb/ft³) = ([vapor molecular weight {lb/lb-mole}] x [true vapor pressure {psia}]) / ([10.731 psia-ft³/lb-mole-°R] x [average vapor temperature (°R)]); See reference (23).

(r) Annual standing loss (lb/yr) = (365) x (vapor space exp. factor per day) x ([π/4] x [diameter (ft)]²) x (vapor space outage (ft)) x (vented vapor sat. factor) x (stock vapor density [lb/ft³]) x (1 - [control efficiency (%) / 100]); See reference (24).

(s) Daily standing loss (lb/day) = (annual standing loss [lb/yr]) / (365 days/yr)

(t) Net working loss throughput (ft³/yr or ft³/day) = (5.614 ft³//bbl) x (total annual or daily throughput [bbl/yr or bbl/day]); See reference (25).

(u) Annual or daily sum of the increases in liquid level (ft/yr or ft/day) = ([5.614 ft³/bbl] x [total annual or daily throughput {bbl/yr or bbl/day}]) / ([π/4] x [tank diameter (ft)]²); See reference (26).

(v) Number of turnovers per year or day = (annual or daily sum of the increases in liquid level [ft/yr or ft/day]) / ([maximum liquid height (ft)] - [minimum liquid height (ft)]); See reference (27).

(w) If N <= 36, working loss turnover factor equal to 1, or working loss turnover factor = ([180] + [number of turnovers per year or day]) / ([6] x [number of turnovers per year or day]); See reference (28).

(x) Annual working loss (lb/yr) = (net working loss throughput [ft³/yr]) x (working loss turnover factor) x (working loss product factor) x (stock vapor density [lb/ft³]) x (vent set. correction factor) x (1- [control efficiency (%) / 100]); See reference (30).

(y) Daily working loss (lb/day) = ([vapor molecular weight {lb/lbmol} x worst case vapor pressure {psia}] / [80.273] x [worst case liquid surface temperature (R)]) x (daily filling rate [gal/day]; See reference (30).

(z) Annual or daily total tank routine losses (lb/yr or lb/day) = (annual or daily standing losses [lb/yr or lb/day]) + (annual or daily working losses [lb/yr or lb/day]); See reference (31).

({) Liquid mole fraction of component (lb-mol/lb-mol) = (weight fraction of component in the liquid [lb/lb]) x (molecular weight of liquid stock [lb/lb-mol]) / (moleclular weight of component [lb/lb-mol]); See reference (34).

(|) Partial pressure of component (psia) = (vapor pressure [psia]) x (liquid mole fraction [lb-mol/lb-mol]); See reference (36).

(}) Vapor mole fraction of component (lb-mol/lb-mol) = (partial pressure of component [psia]) / (total vapor pressure of liquid mixture [psia]); See reference (37).

(~) Vapor weight fraction of component (lb/lb) = (vapor mole fraction of component [lb-mol/lb-mol]) x (molecular weight of component [lb/lb-mol]) / (molecular weight of vapor stock [lb/lb-mol]); See reference (38).

(aa) Emission rate of component (lb/yr or lb/day) = (vapor weight fraction of component [lb/lb]) x (annual or daily total routine losses [lb/yr or lb/day]); See reference (39).

REFERENCES:

(1) See Table 3, Storage Tank Input Assumptions and Parameters.

(2) See Table 1, Input Process Rates and Parameters. Requested PTE based on days of kiln operation.

(3) Engineering judgement based on typical bulk storage tank design for representative industries.

(4) AP-42, Chapter 7 (June 2020); see equation 1-36. For vertical tanks, value set to 1. For horizontal tanks, value set to 0.

(5) Assumes maximum liquid surface temperature of 95°F per "TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks." Converted to degrees Rankin.

(6) Representative of average daily minimum and maximum daily temperatures for the 30-year period between 1992 and 2021 for Forest Grove, Oregon (Station ID 352997). Data obtained from the WRCC.

(7) AP-42, Chapter 7 (June 2020); Table 7.1-7. Assumes Salem, Oregon as it's the nearest city in the table to the facility .

(8) AP-42, Chapter 7 (June 2020); Table 7.1-2. Assumes chemical properties for no. 2 fuel oil (diesel) as representative.

(9) AP-42, Chapter 7 (June 2020); see equation 1-25.

(10) AP-42, Chapter 7 (June 2020); see equation 1-11.

(11) AP-42, Chapter 7 (June 2020); Table 7.1-6.

(12) AP-42, Chapter 7 (June 2020); see equation 1-7.

(13) AP-42, Chapter 7 (June 2020); see equation 1-12.

(14) AP-42, Chapter 7 (June 2020); see equation 1-16. Per equation 1-16 notes, liquid height typically assumed to be at the half full level in the absence of site-specific data.

(15) AP-42, Chapter 7 (June 2020); see equation 1-18 for cone roofs (assumes standard cone roof slope of 0.0625 ft/ft), or see equation 1-20 for dome roofs (assumes modified dome roof radius equation).

(16) AP-42, Chapter 7 (June 2020); see equation 1-17 for cone roofs, or see equation 1-19 for dome roofs.

(17) AP-42, Chapter 7 (June 2020); see equation 1-16.

(18) AP-42, Chapter 7 (June 2020); see equation 1-21. Assumes true vapor pressure as the vapor pressure at average daily liquid surface temperature.

(19) AP-42, Chapter 7 (June 2020); see equation 1-30.

(20) AP-42, Chapter 7 (June 2020); see equation 1-31.

(21) AP-42, Chapter 7 (June 2020); see equation 1-28.

(22) AP-42, Chapter 7 (June 2020); see equation 1-32. Note the simplified version of this equation (e.g. equation 1-33) was not used since HS/D is not equal to 0.5, and allows for variances in aR and aS.

(23) AP-42, Chapter 7 (June 2020); see equation 1-22.

(24) AP-42, Chapter 7 (June 2020); see equation 1-4.

(25) AP-42, Chapter 7 (June 2020); see equation 1-39.

(26) AP-42, Chapter 7 (June 2020); see equation 1-37.

(27) AP-42, Chapter 7 (June 2020); see equation 1-36.

(28) AP-42, Chapter 7 (June 2020); see notes for equation 1-37.

(29) AP-42, Chapter 7 (June 2020); see notes for equation 1-37. Assumes working loss product factor is 0.75 for crude oils, or 1 for all other organic liquids.

(30) TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Equation 1.

(31) AP-42, Chapter 7 (June 2020); see equation 1-1.

(32) See Table 4, Storage Tank Solution Compositions.

(33) Molecular weights obtained from National Institute of Standards and Technology Chemistry WebBook.

(34) AP-42, Chapter 7 (June 2020); see equation 40-4.

(35) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature.

(36) AP-42, Chapter 7 (June 2020); see equation 40-3.

(37) AP-42, Chapter 7 (June 2020); see equation 40-5.

(38) AP-42, Chapter 7 (June 2020); see equation 40-6.

(39) AP-42, Chapter 7 (June 2020); see equation 40-1.

Table 29
Gasoline Storage Tank (G1) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		(Units)	Storage Tank G1 (Gasoline)		AP-42 Variable
			2019 Actual	Requested PTE	
PRODUCTION VALUES					
Storage Tank ID	(1)	--	G1		--
Total Annual Throughput	(1)	(gal/yr)	9,100	15,000	--
Total Annual Throughput	(a)	(bbl/yr)	217	357	Q
Maximum Daily Throughput	(1)	(gal/day)	3,624	3,624	--
Maximum Daily Throughput	(a)	(bbl/day)	86.3	86.3	--
Annual Days of Operation	(2)	(days/yr)	200	365	--
TANK PROPERTIES					
Tank Type (Fixed Roof or Internal Floating Roof Tank)	(1)	--	Fixed-Roof		--
Heated or Not Heated?	(1)	--	Not Heated		--
Controlled or Fugitive?	(1)	--	Fugitive		--
Control Efficiency		(%)	0		--
Tank Roof Color	(1)	--	Aluminum-Diffuse		--
Tank Roof Condition	(1)	--	Average		--
Tank Shell Color	(1)	--	Aluminum-Diffuse		--
Tank Shell Condition	(1)	--	Average		--
Horizontal or Vertical	(1)	--	Horizontal		--
Tank Diameter	(1)	(ft)	6.90		D
Tank Shell Height or Length of Horizontal Tank	(1)	(ft)	21.0		H_S
Roof Type	(3)	--	Cone		--
Maximum Liquid Height	(1)	(ft)	5.42		H_{LX}
Minimum Liquid Height	(4)	(ft)	0		H_{LN}
TANK CONTENT PROPERTIES					
Average Daily Liquid Surface Temperature	(b)	(°R)	518		T_{LA}
Maximum Liquid Surface Temperature	(5)	(°R)	555		T_{MAX}
Average Daily Maximum Liquid Temperature	(c)	(°R)	527		T_{LX}
Average Daily Minimum Liquid Temperature	(d)	(°R)	510		T_{LN}
Liquid Molecular Weight	(9)	(lb/lb-mole)	92		M_L
Vapor Molecular Weight	(9)	(lb/lb-mole)	66		M_V
Vapor Pressure Equation Constant A	(9)	--	11.724		A
Vapor Pressure Equation Constant B	(9)	--	5,237		B
True Vapor Pressure at maximum liquid surface temperature.	(e)	(psia)	9.80		P_{VA}
True Vapor Pressure at average daily liquid surface temperature	(e)	(psia)	5.07		P_{VA}
ENVIRONMENTAL FACTORS					
Average Daily Maximum Ambient Temperature	(7)	(°R)	528		T_{AX}
Average Daily Minimum Ambient Temperature	(7)	(°R)	499		T_{AN}
Average Atmospheric Pressure	(f)	(psia)	14.64		P_A
Average Daily Total Insolation on a Horizontal Surface	(8)	(Btu/ft^2-day)	1,145		I
CALCUALTED VARIABLES					
Standing Loss Calculations					
Average Daily Ambient Temperature Range	(g)	(°R)	29.0		ΔT_A
Tank Roof Surface Solar Absorptance	(12)	--	0.64		a_R
Tank Shell Surface Solar Absorptance	(12)	--	0.64		a_S
Average Tank Surface Solar Absorptance	(h)	--	0.64		a
Average Daily Minimum Liquid Vapor Pressure	(i)	(psia)	4.26		P_{VN}
Average Daily Maximum Liquid Vapor Pressure	(j)	(psia)	5.99		P_{VX}
Average Daily Vapor Pressure Range	(k)	(psia)	1.73		ΔP_V
Average Daily Vapor Temperature Range	(l)	(°R)	35.0		ΔT_V
Vapor Space Expansion Factor	(m)	--	0.24		K_E
Effective Tank Diameter (If Horizontal Tank)	(n)	(ft)	13.6		D_E
Liquid Height	(16)	(ft)	10.5		H_L
Tank Shell Radius	(1)	(ft)	3.45		R_S
Tank Roof Height	(17)	(ft)	0.22		H_R
Roof Outage	(18)	(ft)	0.072		H_{RO}
Vapor Space Outage	(o)	(ft)	2.71		H_{VO}
Vented Vapor Saturation Factor	(p)	--	0.58		K_S
Average Daily Ambient Temperature	(q)	(°R)	514		T_{AA}
Liquid Bulk Temperature	(r)	(°R)	516		T_B
Average Vapor Temperature	(t)	(°R)	519		T_V
Breather Vent Pressure Setting Range	(25)	(psig)	0.060		ΔP_B
Stock Vapor Density	(u)	(lb/ft^3)	0.060		W_V
Annual Standing Loss	(v)	(lb/yr)	1,205		L_S
Daily Standing Loss	(w)	(lb/day)	3.30		--
Working Loss Calculations					
Annual Net Working Loss Throughput	(x)	(ft^3/yr)	1,216	2,005	V_Q
Annual Sum of the Increase is Liquid Level	(y)	(ft/yr)	8.4	13.8	ΣH_{QI}
Number of Turnovers per Year	(z)	--	1.5	2.6	N
Working Loss Turnover (Saturation) Factor per Year	(l)	--	1.00	1.00	K_N
Daily Net Working Loss Throughput	(x)	(ft^3/day)	484	484	V_Q
Daily Sum of the Increase is Liquid Level	(y)	(ft/day)	13.0	13.0	ΣH_{QI}
Number of Turnovers per Day	(z)	--	2.39	2.39	N
Working Loss Turnover (Saturation) Factor per Day	(l)	--	1.00	1.00	K_N
Working Loss Product Factor	(32)	--	1.00	1.00	K_P
Vent Setting Correction Factor	(31)	--	1.00	1.00	K_B
Annual Working Loss	( )	(lb/yr)	73.1	120	L_W
Daily Working Loss	(j)	(lb/day)	52.63	52.63	--
Annual Total Tank Routine Losses	(~)	**(lb/yr)**	**1,278**	**1,325**	**L_T**
Daily Total Tank Routine Losses	(~)	**(lb/day)**	**55.9**	**55.9**	**--**

All notes and references are provided on the following page. See Table 29 (Continued), Gasoline Storage Tank (G1) TAC Emission Estimates.

Table 29 (Continued)
Gasoline Storage Tank (G1) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	DEQ Sequence Number	Regulatory Category (Yes/No)			Physical Characteristics			EPA Tanks Methodology (Annual Calculations)				EPA Tanks Methodology (Daily Calculations)				Emissions Estimate			
						Z_{li}	M_i	x_i	P	P_i	y_i	Z_{vi}	P	P_i	y_i	Z_{vi}	L_{Ti} (2019 Actual)		L_{Ti} (Requested PTE)	
			TAC	HAP	RBC	Liquid Weight Fraction	Molecular Weight (lb/lb-mol)	Liquid Mole Fraction	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Maximum Daily (lb/day)	Annual (lb/yr)	Maximum Daily (lb/day)	Annual (lb/yr)
Benzene	71-43-2	46	Yes	Yes	Yes	8.7E-03 (35)	78.1 (36)	1.0E-02 (l)	1.14 (38)	1.2E-02 (€)	2.3E-03 (l)	2.7E-03 (,)	2.87 (38)	2.9E-02 (€)	3.0E-03 (l)	3.5E-03 (l)	0.20 (aa)	3.47 (aa)	0.20 (aa)	3.60 (aa)
Toluene	108-88-3	600	Yes	Yes	Yes	2.2E-02 (35)	92.1 (36)	2.2E-02 (l)	0.32 (38)	7.0E-03 (€)	1.4E-03 (l)	1.9E-03 (,)	0.90 (38)	2.0E-02 (€)	2.0E-03 (l)	2.8E-03 (l)	0.16 (aa)	2.46 (aa)	0.16 (aa)	2.55 (aa)
Ethylbenzene	100-41-4	229	Yes	Yes	Yes	4.3E-03 (35)	106 (36)	3.8E-03 (l)	0.10 (38)	3.8E-04 (€)	7.5E-05 (l)	1.2E-04 (,)	0.32 (38)	1.2E-03 (€)	1.2E-04 (l)	2.0E-04 (l)	1.1E-02 (aa)	0.15 (aa)	1.1E-02 (aa)	0.16 (aa)
p-Xylene, m-xylene	106-42-3	631	Yes	Yes	Yes	1.3E-02 (35)	106 (36)	1.1E-02 (l)	9.4E-02 (38)	1.1E-03 (€)	2.1E-04 (l)	3.3E-04 (,)	0.30 (38)	3.3E-03 (€)	3.4E-04 (l)	5.5E-04 (l)	3.1E-02 (aa)	0.43 (aa)	3.1E-02 (aa)	0.44 (aa)
o-Xylene	95-47-6	630	Yes	Yes	Yes	6.5E-03 (35)	106 (36)	5.6E-03 (l)	6.9E-02 (38)	3.9E-04 (€)	7.7E-05 (l)	1.2E-04 (,)	0.23 (38)	1.3E-03 (€)	1.3E-04 (l)	2.1E-04 (l)	1.2E-02 (aa)	0.16 (aa)	1.2E-02 (aa)	0.16 (aa)
Isopropylbenzene (Cumene)	98-82-8	157	Yes	Yes	Yes	4.9E-04 (35)	120 (36)	3.8E-04 (l)	4.6E-02 (38)	1.8E-05 (€)	3.5E-06 (l)	6.3E-06 (,)	0.16 (38)	6.1E-05 (€)	6.2E-06 (l)	1.1E-05 (l)	6.3E-04 (aa)	8.0E-03 (aa)	6.3E-04 (aa)	8.3E-03 (aa)
n-Propylbenzene	103-65-1	--	No	No	No	3.0E-03 (35)	120 (36)	2.3E-03 (l)	3.4E-02 (38)	7.7E-05 (€)	1.5E-05 (l)	2.8E-05 (,)	0.12 (38)	2.7E-04 (€)	2.8E-05 (l)	5.1E-05 (l)	--	--	--	--
p-Isopropyltoluene	99-87-6	--	No	No	No	1.2E-04 (35)	134 (36)	8.5E-05 (l)	1.4E-02 (38)	1.2E-06 (€)	2.3E-07 (l)	4.7E-07 (,)	5.4E-02 (38)	4.6E-06 (€)	4.7E-07 (l)	9.5E-07 (l)	--	--	--	--
4-Ethyltoluene	622-96-8	--	No	No	No	1.2E-02 (35)	120 (36)	9.0E-03 (l)	2.9E-02 (38)	2.6E-04 (€)	5.2E-05 (l)	9.5E-05 (,)	0.11 (38)	9.6E-04 (€)	9.7E-05 (l)	1.8E-04 (l)	--	--	--	--
2-Ethyltoluene	611-14-3	--	No	No	No	4.9E-03 (35)	120 (36)	3.7E-03 (l)	2.4E-02 (38)	9.1E-05 (€)	1.8E-05 (l)	3.3E-05 (,)	9.0E-02 (38)	3.4E-04 (€)	3.4E-05 (l)	6.2E-05 (l)	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	615	Yes	No	Yes	5.7E-03 (35)	120 (36)	4.4E-03 (l)	2.4E-02 (38)	1.0E-04 (€)	2.0E-05 (l)	3.7E-05 (,)	8.8E-02 (38)	3.8E-04 (€)	3.9E-05 (l)	7.1E-05 (l)	4.0E-03 (aa)	4.7E-02 (aa)	4.0E-03 (aa)	4.9E-02 (aa)
1,2,4-Trimethylbenzene	95-63-6	614	Yes	No	Yes	1.5E-02 (35)	120 (36)	1.1E-02 (l)	2.0E-02 (38)	2.3E-04 (€)	4.4E-05 (l)	8.1E-05 (,)	7.4E-02 (38)	8.5E-04 (€)	8.7E-05 (l)	1.6E-04 (l)	8.8E-03 (aa)	0.10 (aa)	8.8E-03 (aa)	0.11 (aa)
1,2,3-Trimethylbenzene	526-73-8	613	Yes	No	Yes	5.6E-03 (35)	120 (36)	4.3E-03 (l)	1.4E-02 (38)	6.0E-05 (€)	1.2E-05 (l)	2.2E-05 (,)	5.5E-02 (38)	2.4E-04 (€)	2.4E-05 (l)	4.4E-05 (l)	2.5E-03 (aa)	2.8E-02 (aa)	2.5E-03 (aa)	2.9E-02 (aa)
sec-Butylbenzene	135-98-8	--	No	No	No	2.2E-04 (35)	134 (36)	1.5E-04 (l)	1.7E-02 (38)	2.7E-06 (€)	5.3E-07 (l)	1.1E-06 (,)	6.6E-02 (38)	1.0E-05 (€)	1.0E-06 (l)	2.1E-06 (l)	--	--	--	--
n-Butylbenzene	104-51-8	--	No	No	No	1.2E-03 (35)	134 (36)	7.9E-04 (l)	9.5E-03 (38)	7.6E-06 (€)	1.5E-06 (l)	3.0E-06 (,)	3.9E-02 (38)	3.1E-05 (€)	3.2E-06 (l)	6.5E-06 (l)	--	--	--	--
Styrene	100-42-5	585	Yes	Yes	Yes	2.0E-05 (35)	104 (36)	1.7E-05 (l)	6.3E-02 (38)	1.1E-06 (€)	2.2E-07 (l)	3.4E-07 (,)	0.21 (38)	3.7E-06 (€)	3.8E-07 (l)	5.9E-07 (l)	3.3E-05 (aa)	4.4E-04 (aa)	3.3E-05 (aa)	4.6E-04 (aa)
Naphthalene	91-20-3	428	Yes	Yes	Yes	3.2E-03 (35)	128 (36)	2.3E-03 (l)	2.3E-03 (38)	5.2E-06 (€)	1.0E-06 (l)	2.0E-06 (,)	1.0E-02 (38)	2.3E-05 (€)	2.4E-06 (l)	4.6E-06 (l)	2.6E-04 (aa)	2.5E-03 (aa)	2.6E-04 (aa)	2.6E-03 (aa)
n-Heptane	142-82-5	--	No	No	No	1.8E-02 (35)	100 (36)	1.7E-02 (l)	0.53 (38)	8.7E-03 (€)	1.7E-03 (l)	2.6E-03 (,)	1.43 (38)	2.4E-02 (€)	2.4E-03 (l)	3.7E-03 (l)	--	--	--	--
n-Octane	111-65-9	--	No	No	No	4.0E-03 (35)	114 (36)	3.3E-03 (l)	0.14 (38)	4.5E-04 (€)	8.9E-05 (l)	1.5E-04 (,)	0.44 (38)	1.4E-03 (€)	1.4E-04 (l)	2.5E-04 (l)	--	--	--	--
n-Nonane	111-84-2	--	No	No	No	2.5E-03 (35)	128 (36)	1.8E-03 (l)	3.6E-02 (38)	6.6E-05 (€)	1.3E-05 (l)	2.5E-05 (,)	0.12 (38)	2.1E-04 (€)	2.2E-05 (l)	4.2E-05 (l)	--	--	--	--
n-Decane	124-18-5	--	No	No	No	2.0E-03 (35)	142 (36)	1.3E-03 (l)	1.0E-02 (38)	1.3E-05 (€)	2.6E-06 (l)	5.6E-06 (,)	2.9E-02 (38)	3.6E-05 (€)	3.7E-06 (l)	8.0E-06 (l)	--	--	--	--
n-Undecane	1120-21-4	--	No	No	No	1.6E-03 (35)	156 (36)	9.3E-04 (l)	3.3E-03 (38)	3.1E-06 (€)	6.1E-07 (l)	1.4E-06 (,)	1.6E-02 (38)	1.5E-05 (€)	1.5E-06 (l)	3.7E-06 (l)	--	--	--	--
n-Dodecane	112-40-3	--	No	No	No	1.2E-03 (35)	170 (36)	6.3E-04 (l)	8.8E-04 (38)	5.5E-07 (€)	1.1E-07 (l)	2.8E-07 (,)	5.2E-03 (38)	3.3E-06 (€)	3.3E-07 (l)	8.6E-07 (l)	--	--	--	--
n-Tridecane	629-50-5	--	No	No	No	9.1E-04 (35)	184 (36)	4.5E-04 (l)	2.3E-04 (38)	1.1E-07 (€)	2.1E-08 (l)	5.8E-08 (,)	1.7E-03 (38)	7.5E-07 (€)	7.6E-08 (l)	2.1E-07 (l)	--	--	--	--
n-Tetradecane	629-59-4	--	No	No	No	3.0E-04 (35)	198 (36)	1.4E-04 (l)	5.9E-05 (38)	8.2E-09 (€)	1.6E-09 (l)	4.9E-09 (,)	5.1E-04 (38)	7.1E-08 (€)	7.3E-09 (l)	2.2E-08 (l)	--	--	--	--
n-Pentadecane	629-62-9	--	No	No	No	8.7E-05 (35)	212 (36)	3.8E-05 (l)	1.5E-05 (38)	5.5E-10 (€)	1.1E-10 (l)	3.5E-10 (,)	1.6E-04 (38)	5.9E-09 (€)	6.0E-10 (l)	1.9E-09 (l)	--	--	--	--
n-Hexadecane	544-76-3	--	No	No	No	2.5E-05 (35)	226 (36)	1.0E-05 (l)	3.5E-06 (38)	3.7E-11 (€)	7.2E-12 (l)	2.5E-11 (,)	4.7E-05 (38)	4.9E-10 (€)	5.0E-11 (l)	1.7E-10 (l)	--	--	--	--
Cyclohexane	110-82-7	162	Yes	No	Yes	1.4E-02 (35)	84.2 (36)	1.5E-02 (l)	1.18 (38)	1.8E-02 (€)	3.5E-03 (l)	4.5E-03 (,)	2.91 (38)	4.4E-02 (€)	4.5E-03 (l)	5.7E-03 (l)	0.32 (aa)	5.76 (aa)	0.32 (aa)	5.97 (aa)
Methyl cyclohexane	108-87-2	--	No	No	No	1.2E-02 (35)	98.2 (36)	1.1E-02 (l)	0.54 (38)	5.9E-03 (€)	1.2E-03 (l)	1.7E-03 (,)	1.42 (38)	1.6E-02 (€)	1.6E-03 (l)	2.4E-03 (l)	--	--	--	--
Total TAC Emission Estimates																	**0.74**	**12.61**	**0.74**	**13.08**
Total HAP Emission Estimates																	**0.41**	**6.68**	**0.41**	**6.92**
Total RBC-Only Emission Estimates																	**0.74**	**12.61**	**0.74**	**13.08**
Total Non-RBC Emission Estimates																	**0**	**0**	**0**	**0**

NOTES:
(a) Total annual or daily throughput (bbl/"unit") = (total annual or daily throughput [gal/"unit"]) x (bbl/42 gal)
(b) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor (Btu/ft²-day)]]; See reference (22).
(c) Average daily maximum liquid temperature (°R) = (average daily liquid surface temperature, °R) + 0.25 x (average daily vapor temperature range, °R); See reference (5).
(d) Average daily minimum liquid temperature (°R) = (average daily liquid surface temperature, °R) - 0.25 x (average daily vapor temperature range, °R); See reference (5).
(e) True vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average daily liquid surface temperature (°R)]]; See reference (10).
(f) Average atmospheric pressure (psia) = (101,325 x (1 - 2.2557 x 10^{-5} x [site elevation {m}])$^{5.25588}$ / (6,894.76 pa/psia)
Site Elevation (m) = 65.5
(g) Average daily ambient temperature range (°R) = ([daily maximum ambient temperature (°R)] - [daily minimum ambient temperature (°R)]]; See reference (11).
(h) Average tank surface solar absorbance = ([tank roof surface solar absorptance] + [tank shell surface solar absorptance]) / (2); See reference (12).
(i) Average daily minimum vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average daily minimum liquid surface temperature (°R)]]; See reference (9).
(j) Average daily maximum vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average maximum daily liquid surface temperature (°R)]]; See reference (9).
(k) Average daily vapor pressure range (psia) = (average daily maixmum vapor pressure [psia]) - (average daily minimum vapor pressure [psia])
(l) Average daily vapor temperature range (°R) = ([0.7] x [average daily temperature range (°R)]) + ([0.02] x [average tank surface solar absorptance] x [average daily total insolation factor (Btu/ft²-d)]]; See reference (13).
(m) Vapor space expansion factor = ([average daily vapor temperature range (°R)] / [average daily liquid surface temperature [°R]) + ([average daily vapor pressure range {psia} - breather vent pressure setting range {psia}] / [average daily liquid surface temperature [°R])
+ (atmospheric pressure {psia} - vapor pressure at average daily liquid surface temperature {psia}]; See reference (14).
(n) Effective tank diameter (ft) = ([tank length {ft}] x [tank diameter {ft}] / [π/4])^(1/2); See reference (14).
(o) For Vertical Tanks: Vapor space outage (ft) = (tank shell height {ft}] - (liquid height {ft}) + (roof outage {ft}]; See reference (19).
For Horizontal Tanks: Vapor space outage (ft) = (π / 8) x (tank diameter {ft}]; See reference (19).
(p) Vented vapor saturation factor = (1) / ([1] + [0.053] x [vapor pressure at average daily liquid surface temperature (psia)] x [vapor space outage {ft}]]; See reference (20).
(q) Average daily ambient temperature (°R) = ([average daily maximum ambient temperature (°R)] + [average daily minimum ambient temperature (°R)]) / (2); See reference (21).
(r) If non-heated tank: Liquid bulk temperature (°R) = (average daily ambient temperature [°R]) + ([0.003] x [tank shell surface solar absorptance {°R}] x [average daily total insolation factor {Btu/ft²-day}]]; See reference (22).
For heated tanks, the setpoint temperature for the storage tank is assumed to be representative of the liquid bulk temperature.
(s) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature {°R}) + ([0.005] X [tank shell surface solar absorptance {°R}] x [average daily total insolation factor {Btu/ft²-day}]]; See reference (21).
(t) Average vapor temperature (°R) = ([2.2 x {tank shell height |ft|} / {tank diameter |ft|} + 1.1] x [average daily ambient temperature {°R}] + [0.8 x {liquid bulk temperature |°R|}] + [0.021 x {tank roof surface solar absorptance} x {average daily total insolation factor |Btu/ft²-day|}] + [0.013 x {tank shell height |ft|} / {tank diameter |ft|} x {tank shell surface solar absorptance} x {average daily total insolation factor {|Btu/ft²-day|}]) / (2.2 x [tank shell height {ft}] / [tank diameter {ft}] + 1.9); See reference (24).
(u) Stock vapor density (lb/ft³) = ([vapor molecular weight {lb/lb-mole}] x [true vapor pressure {psia}]) / ([10.731 psia-ft³/lb-mole-°R] x [average vapor temperature (°R)]]; See reference (26).
(v) Annual standing loss (lb/yr) = (365) x (vapor space exp. factor per day) x ([π/4] x [diameter {ft}]²) x (vapor space outage [ft]) x (vented vapor sat. factor) x (stock vapor density [lb/ft³]) x (1 - [control efficiency {%} / 100]); See reference (27).
(w) Daily standing loss (lb/day) = (annual standing loss [lb/yr]) / (365 days/yr)
(x) Net working loss throughput (ft³/yr or ft³/day) = (5.614 ft³/bbl) x (total annual or daily throughput [bbl/yr or bbl/day]); See reference (28).
(y) Annual or daily sum of the increases in liquid level (ft/yr or ft/day) = ([5.614 ft³/bbl] x [total annual or daily throughput {bbl/yr or bbl/day}]) / ([π/4] x [tank diameter {ft}]²; See reference (29).
(z) Number of turnovers per year or day = (annual or daily sum of the increases in liquid level [ft/yr or ft/day]) / ([maximum liquid height {ft}] - [minimum liquid height {ft}]]; See reference (30).
({) If N <= 36, working loss turnover factor equal to 1, or working loss turnover factor = ([180] + [number of turnovers per year or day]) / ([6] x [number of turnovers per year or day]); See reference (31).
(|) Annual working loss (lb/yr) = (net working loss throughput [ft³/yr]) x (working loss turnover factor) x (working loss product factor) x (stock vapor density [lb/ft³]) x (vent set. correction factor) x (1- [control efficiency {%} / 100]); See reference (30).
(}) Daily working loss (lb/day) = ([vapor molecular weight {lb/lbmol} x worst case vapor pressure {psia}] / [80.273] x [worst case liquid surface temperature {R}]) x (daily filling rate [gal/day]; See reference (33).
(~) Annual or daily total tank routine losses (lb/yr or lb/day) = (annual or daily standing losses [lb/yr or lb/day]) + (annual or daily working losses [lb/yr or lb/day]); See reference (34).
( ) Liquid mole fraction of component (lb-mol/lb-mol) = (weight fraction of component in the liquid [lb/lb]) x (molecular weight of liquid stock [lb/lb-mol]) / (moleclular weight of component [lb/lb-mol]; See reference (37).
(€) Partial pressure of component (psia) = (vapor pressure [psia]) x (liquid mole fraction [lb-mol/lb-mol]); See reference (39).
(|) Vapor mole fraction of component (lb-mol/lb-mol) = (partial pressure of component [psia]) / (total vapor pressure of liquid mixture [psia]); See reference (40).
(,) Vapor weight fraction of component (lb/lb) = (vapor mole fraction of component [lb-mol/lb-mol]) x (molecular weight of component [lb/lb-mol]) / (molecular weight of vapor stock [lb/lb-mol]; See reference (41).
(aa) Emission rate of component (lb/yr or lb/day) = (vapor weight fraction of component [lb/lb]) x (annual or daily total routine losses [lb/yr or lb/day]); See reference (42).

REFERENCES:
(1) See Table 3, Storage Tank Input Assumptions and Parameters.
(2) See Table 1, Input Process Rates and Parameters. Requested PTE based on days of kiln operation.
(3) Engineering judgement based on typical bulk storage tank design for representative industries.
(4) AP-42, Chapter 7 (June 2020); see equation 1-36. For vertical tanks, value set to 1. For horizontal tanks, value set to 0.
(5) Assumes maximum daily temperature of 95°F per TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Converted to degrees Rankin.
(6) AP-42, Chapter 7 (June 2020); see Figure 7.1-17.
(7) Representative of average daily minimum and maximum daily temperatures for the 30-year period between 1992 and 2021 for Forest Grove, Oregon (Station ID 352997). Data obtained from the WRCC.
(8) AP-42, Chapter 7 (June 2020); Table 7.1-7. Assumes Salem, Oregon as it's the nearest city in the table to the facility .
(9) AP-42, Chapter 7 (June 2020); Table 7.1-2. Assumes chemical properties for motor gasoline (RVP 10) as representative.
(10) AP-42, Chapter 7 (June 2020); see equation 1-25.
(11) AP-42, Chapter 7 (June 2020); see equation 1-11.
(12) AP-42, Chapter 7 (June 2020); Table 7.1-6.
(13) AP-42, Chapter 7 (June 2020); see equation 1-7.
(14) AP-42, Chapter 7 (June 2020); see equation 1-5.
(15) AP-42, Chapter 7 (June 2020); see equation 1-14. Tank diameter adjustments are only required for horizontal tanks. No adjustments are needed for vertical tanks.
(16) AP-42, Chapter 7 (June 2020); see equation 1-16. Per equation 1-16 notes, liquid height typically assumed to be at the half full level in the absence of site-specific data.
(17) AP-42, Chapter 7 (June 2020); see equation 1-18 for cone roofs (assumes standard cone roof slope of 0.0625 ft/ft), or see equation 1-20 for dome roofs (assumes modified dome roof radius equation).
(18) AP-42, Chapter 7 (June 2020); see equation 1-17 for cone roofs, or see equation 1-19 for dome roofs.
(19) AP-42, Chapter 7 (June 2020); see equation 1-16.
(20) AP-42, Chapter 7 (June 2020); see equation 1-21. Assumes true vapor pressure as the vapor pressure at average daily liquid surface temperature.
(21) AP-42, Chapter 7 (June 2020); see equation 1-30.
(22) AP-42, Chapter 7 (June 2020); see equation 1-31.
(23) AP-42, Chapter 7 (June 2020); see equation 1-28.
(24) AP-42, Chapter 7 (June 2020); see equation 1-32. Note the simplified version of this equation (e.g. equation 1-33) was not used since HS/D is not equal to 0.5, and allows for variances in aR and aS.
(25) Breather vent pressure setting and vacuum settings are unknown. 0.06 psig assumed as typical value per AP42 Chapter 7.1. Note 3 to Equation 1-10.
(26) AP-42, Chapter 7 (June 2020); see equation 1-22.
(27) AP-42, Chapter 7 (June 2020); see equation 1-4.
(28) AP-42, Chapter 7 (June 2020); see equation 1-39.
(29) AP-42, Chapter 7 (June 2020); see equation 1-37.
(30) AP-42, Chapter 7 (June 2020); see equation 1-36.
(31) AP-42, Chapter 7 (June 2020); see notes for equation 1-35.
(32) AP-42, Chapter 7 (June 2020); see notes for equation 1-37. Assumes working loss product factor is 0.75 for crude oils, or 1 for all other organic liquids.
(33) TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Equation 1.
(34) AP-42, Chapter 7 (June 2020); see equation 1-1.
(35) See Table 4, Storage Tank Solution Compositions.
(36) Molecular weights obtained from National Institute of Standards and Technology Chemistry WebBook.
(37) AP-42, Chapter 7 (June 2020); see equation 40-4.
(38) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature.
(39) AP-42, Chapter 7 (June 2020); see equation 40-3.
(40) AP-42, Chapter 7 (June 2020); see equation 40-5.
(41) AP-42, Chapter 7 (June 2020); see equation 40-6.
(42) AP-42, Chapter 7 (June 2020); see equation 40-1.

Table 30
Diesel Storage Tank (D2) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		(Units)	Storage Tank D2 (Diesel)		AP-42 Variable
			2019 Actual	Requested PTE	
PRODUCTION VALUES					
Storage Tank ID	(1)	--	D2		--
Total Annual Throughput	(1)	(gal/yr)	54,277	87,000	--
Total Annual Throughput	(a)	(bbl/yr)	1,292	2,071	Q
Maximum Daily Throughput	(1)	(gal/day)	5,915	5,915	--
Maximum Daily Throughput	(a)	(bbl/day)	141	141	--
Annual Days of Operation	(2)	(days/yr)	200	365	--
TANK PROPERTIES					
Tank Type (Fixed Roof or Internal Floating Roof Tank)	(1)	--	Fixed-Roof		--
Heated or Not Heated?	(1)	--	Not Heated		--
Controlled or Fugitive?	(1)	--	Fugitive		--
Control Efficiency		(%)	0		--
Tank Roof Color	(1)	--	Aluminum-Diffuse		--
Tank Roof Condition	(1)	--	Average		--
Tank Shell Color	(1)	--	Aluminum-Diffuse		--
Tank Shell Condition	(1)	--	Average		--
Horizontal or Vertical	(1)	--	Horizontal		--
Tank Diameter	(1)	(ft)	8.00		D
Tank Shell Height or Length of Horizontal Tank	(1)	(ft)	25.5		H_S
Roof Type	(3)	--	Cone		--
Maximum Liquid Height	(1)	(ft)	6.28		H_{LX}
Minimum Liquid Height	(4)	(ft)	0		H_{LN}
TANK CONTENT PROPERTIES					
Average Daily Liquid Surface Temperature	(b)	(°R)	518		T_{LA}
Maximum Liquid Surface Temperature	(5)	(°R)	555		T_{MAX}
Average Daily Maximum Liquid Temperature	(c)	(°R)	527		T_{LX}
Average Daily Minimum Liquid Temperature	(d)	(°R)	510		T_{LN}
Liquid Molecular Weight	(8)	(lb/lb-mole)	188		M_L
Vapor Molecular Weight	(8)	(lb/lb-mole)	130		M_V
Vapor Pressure Equation Constant A	(8)	--	12.101		A
Vapor Pressure Equation Constant B	(8)	(°R)	8,907		B
True Vapor Pressure	(e)	(psia)	6.2E-03		P_{VA}
Daily Maximum Vapor Pressure	(e)	(psia)	1.9E-02		P_{VA}
ENVIRONMENTAL FACTORS					
Average Daily Maximum Ambient Temperature	(6)	(°R)	528		T_{AX}
Average Daily Minimum Ambient Temperature	(6)	(°R)	499		T_{AN}
Average Daily Total Insolation on a Horizontal Surface	(7)	(Btu/ft^2-day)	1,145		I
CALCUALTED VARIABLES					
Standing Loss Calculations					
Average Daily Ambient Temperature Range	(f)	(°R)	29.00		ΔT_A
Tank Roof Surface Solar Absorptance	(11)	--	0.64		a_R
Tank Shell Surface Solar Absorptance	(11)	--	0.64		a_S
Average Tank Surface Solar Absorptance	(g)	--	0.64		a
Average Daily Vapor Temperature Range	(h)	(°R)	35.0		ΔT_V
Vapor Space Expansion Factor	(i)	--	0.063		K_E
Effective Tank Diameter (If Horizontal Tank)	(j)	(ft)	16.1		D_E
Liquid Height	(14)	(ft)	12.8		H_L
Tank Shell Radius	(1)	(ft)	4.00		R_S
Tank Roof Height	(15)	(ft)	0.25		H_R
Roof Outage	(16)	(ft)	0.083		H_{RO}
Vapor Space Outage	(k)	(ft)	3.14		H_{VO}
Vented Vapor Saturation Factor	(l)	--	1.00		K_S
Average Daily Ambient Temperature	(m)	(°R)	514		T_{AA}
Liquid Bulk Temperature	(n)	(°R)	516		T_B
Average Daily Liquid Surface Temperature	(o)	(°R)	518		T_{LA}
Average Vapor Temperature	(p)	(°R)	519		T_V
Stock Vapor Density	(q)	(lb/ft^3)	1.5E-04		W_V
Annual Standing Loss	(r)	(lb/yr)	2.14		L_S
Daily Standing Loss	(s)	(lb/day)	5.9E-03		--
Working Loss Calculations					
Annual Net Working Loss Throughput	(t)	(ft^3/yr)	7,255	11,629	V_Q
Annual Sum of the Increase is Liquid Level	(u)	(ft/yr)	35.6	57.0	ΣH_{QI}
Number of Turnovers per Year	(v)	--	5.66	9.1	N
Working Loss Turnover (Saturation) Factor per Year	(w)	--	1.00	1.00	K_N
Daily Net Working Loss Throughput	(t)	(ft^3/day)	791	791	V_Q
Daily Sum of the Increase is Liquid Level	(u)	(ft/day)	15.7	15.7	ΣH_{QI}
Number of Turnovers per Day	(v)	--	2.50	2.50	N
Working Loss Turnover (Saturation) Factor per Day	(w)	--	1.00	1.00	K_N
Working Loss Product Factor	(29)	--	1.00	1.00	K_P
Vent Setting Correction Factor	(28)	--	1.00	1.00	K_B
Annual Working Loss	(x)	(lb/yr)	1.06	1.69	L_W
Daily Working Loss	(y)	(lb/day)	0.33	0.33	--
Annual Total Tank Routine Losses	**(z)**	**(lb/yr)**	**3.20**	**3.83**	**L_T**
Daily Total Tank Routine Losses	**(z)**	**(lb/day)**	**0.34**	**0.34**	**--**

All notes and references are provided on the following page. See Table 30 (Continued), Diesel Storage Tank (D2) TAC Emission Estimates.

Table 30 (Continued)
Diesel Storage Tank (D2) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	DEQ Sequence Number	Regulatory Category (Yes/No)			Physical Characteristics			EPA Tanks Methodology (Annual Calculations)				EPA Tanks Methodology (Daily Calculations)				Emissions Estimate			
						Z_{ll}	M_i	x_i	P	P_i	y_i	Z_{vi}	P	P_i	y_i	Z_{vi}	L_{Ti} (2019 Actual)		L_{Ti} (Requested PTE)	
			TAC	HAP	RBC	Liquid Weight Fraction	Molecular Weight (lb/lb-mol)	Liquid Mole Fraction	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Maximum Daily (lb/day)	Annual (lb/yr)	Maximum Daily (lb/day)	Annual (lb/yr)
Benzene	71-43-2	46	Yes	Yes	Yes	7.9E-05 [32]	78.1 [33]	1.9E-04 [l]	1.14 [35]	2.2E-04 [l]	3.5E-02 [l]	2.1E-02 [~]	2.87 [35]	5.5E-04 [l]	2.8E-02 [l]	1.7E-02 [l]	5.8E-03 [aa]	6.7E-02 [aa]	5.8E-03 [aa]	8.0E-02 [aa]
Toluene	108-88-3	600	Yes	Yes	Yes	2.8E-04 [32]	92.1 [33]	5.7E-04 [l]	0.32 [35]	1.8E-04 [l]	3.0E-02 [l]	2.1E-02 [~]	0.90 [35]	5.2E-04 [l]	2.7E-02 [l]	1.9E-02 [l]	6.4E-03 [aa]	6.7E-02 [aa]	6.4E-03 [aa]	8.0E-02 [aa]
Ethylbenzene	100-41-4	229	Yes	Yes	Yes	1.5E-04 [32]	106 [33]	2.6E-04 [l]	0.10 [35]	2.6E-05 [l]	4.2E-03 [l]	3.4E-03 [~]	0.32 [35]	8.3E-05 [l]	4.3E-03 [l]	3.5E-03 [l]	1.2E-03 [aa]	1.1E-02 [aa]	1.2E-03 [aa]	1.3E-02 [aa]
p-Xylene, m-xylene	106-42-3	631	Yes	Yes	Yes	4.9E-04 [32]	106 [33]	8.8E-04 [l]	9.4E-02 [35]	8.3E-05 [l]	1.3E-02 [l]	1.1E-02 [~]	0.30 [35]	2.6E-04 [l]	1.4E-02 [l]	1.1E-02 [l]	3.7E-03 [aa]	3.5E-02 [aa]	3.7E-03 [aa]	4.1E-02 [aa]
o-Xylene	95-47-6	630	Yes	Yes	Yes	2.2E-04 [32]	106 [33]	3.9E-04 [l]	6.9E-02 [35]	2.7E-05 [l]	4.3E-03 [l]	3.5E-03 [~]	0.23 [35]	8.7E-05 [l]	4.6E-03 [l]	3.7E-03 [l]	1.3E-03 [aa]	1.1E-02 [aa]	1.3E-03 [aa]	1.3E-02 [aa]
Isopropylbenzene (Cumene)	98-82-8	157	Yes	Yes	Yes	5.2E-05 [32]	120 [33]	8.1E-05 [l]	4.6E-02 [35]	3.7E-06 [l]	6.0E-04 [l]	5.6E-04 [~]	0.16 [35]	1.3E-05 [l]	6.8E-04 [l]	6.3E-04 [l]	2.1E-04 [aa]	1.8E-03 [aa]	2.1E-04 [aa]	2.1E-03 [aa]
n-Propylbenzene	103-65-1	--	No	No	No	1.4E-04 [32]	120 [33]	2.1E-04 [l]	3.4E-02 [35]	7.1E-06 [l]	1.1E-03 [l]	1.1E-03 [~]	0.12 [35]	2.5E-05 [l]	1.3E-03 [l]	1.2E-03 [l]	--	--	--	--
p-Isopropyltoluene	99-87-6	--	No	No	No	1.3E-04 [32]	134 [33]	1.8E-04 [l]	1.4E-02 [35]	2.6E-06 [l]	4.1E-04 [l]	4.2E-04 [~]	5.4E-02 [35]	1.0E-05 [l]	5.2E-04 [l]	5.4E-04 [l]	--	--	--	--
4-Ethyltoluene	622-96-8	--	No	No	No	4.7E-04 [32]	120 [33]	7.4E-04 [l]	2.9E-02 [35]	2.2E-05 [l]	3.5E-03 [l]	3.2E-03 [~]	0.11 [35]	7.8E-05 [l]	4.1E-03 [l]	3.8E-03 [l]	--	--	--	--
2-Ethyltoluene	611-14-3	--	No	No	No	2.3E-04 [32]	120 [33]	3.6E-04 [l]	2.4E-02 [35]	8.7E-06 [l]	1.4E-03 [l]	1.3E-03 [~]	9.0E-02 [35]	3.2E-05 [l]	1.7E-03 [l]	1.6E-03 [l]	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	615	Yes	No	Yes	2.4E-04 [32]	120 [33]	3.7E-04 [l]	2.4E-02 [35]	8.8E-06 [l]	1.4E-03 [l]	1.3E-03 [~]	8.8E-02 [35]	3.3E-05 [l]	1.7E-03 [l]	1.6E-03 [l]	5.3E-04 [aa]	4.2E-03 [aa]	5.3E-04 [aa]	5.0E-03 [aa]
1,2,4-Trimethylbenzene	95-63-6	614	Yes	No	Yes	8.5E-04 [32]	120 [33]	1.3E-03 [l]	2.0E-02 [35]	2.6E-05 [l]	4.2E-03 [l]	3.9E-03 [~]	7.4E-02 [35]	9.8E-05 [l]	5.1E-03 [l]	4.8E-03 [l]	1.6E-03 [aa]	1.2E-02 [aa]	1.6E-03 [aa]	1.5E-02 [aa]
1,2,3-Trimethylbenzene	526-73-8	613	Yes	No	Yes	2.5E-03 [32]	120 [33]	3.9E-03 [l]	1.4E-02 [35]	5.5E-05 [l]	8.9E-03 [l]	8.2E-03 [~]	5.5E-02 [35]	2.2E-04 [l]	1.1E-02 [l]	1.0E-02 [l]	3.5E-03 [aa]	2.6E-02 [aa]	3.5E-03 [aa]	3.1E-02 [aa]
sec-Butylbenzene	135-98-8	--	No	No	No	1.1E-04 [32]	134 [33]	1.5E-04 [l]	1.7E-02 [35]	2.6E-06 [l]	4.2E-04 [l]	4.3E-04 [~]	6.6E-02 [35]	9.9E-06 [l]	5.2E-04 [l]	5.3E-04 [l]	--	--	--	--
n-Butylbenzene	104-51-8	--	No	No	No	4.4E-04 [32]	134 [33]	6.2E-04 [l]	9.5E-03 [35]	5.9E-06 [l]	9.4E-04 [l]	9.8E-04 [~]	3.9E-02 [35]	2.4E-05 [l]	1.3E-03 [l]	1.3E-03 [l]	--	--	--	--
Styrene	100-42-5	585	Yes	Yes	Yes	2.4E-08 [32]	104 [33]	4.3E-08 [l]	6.3E-02 [35]	2.7E-09 [l]	4.3E-07 [l]	3.5E-07 [~]	0.21 [35]	9.0E-09 [l]	4.7E-07 [l]	3.8E-07 [l]	1.3E-07 [aa]	1.1E-06 [aa]	1.3E-07 [aa]	1.3E-06 [aa]
Naphthalene	91-20-3	428	Yes	Yes	Yes	3.5E-03 [32]	128 [33]	5.2E-03 [l]	2.3E-03 [35]	1.2E-05 [l]	1.9E-03 [l]	1.9E-03 [~]	1.0E-02 [35]	5.3E-05 [l]	2.8E-03 [l]	2.7E-03 [l]	9.2E-04 [aa]	6.0E-03 [aa]	9.2E-04 [aa]	7.2E-03 [aa]
n-Heptane	142-82-5	--	No	No	No	2.0E-04 [32]	100 [33]	3.8E-04 [l]	0.53 [35]	2.0E-04 [l]	3.2E-02 [l]	2.5E-02 [~]	1.43 [35]	5.5E-04 [l]	2.9E-02 [l]	2.2E-02 [l]	--	--	--	--
n-Octane	111-65-9	--	No	No	No	5.7E-04 [32]	114 [33]	9.3E-04 [l]	0.14 [35]	1.3E-04 [l]	2.1E-02 [l]	1.8E-02 [~]	0.44 [35]	4.1E-04 [l]	2.1E-02 [l]	1.9E-02 [l]	--	--	--	--
n-Nonane	111-84-2	--	No	No	No	8.3E-03 [32]	128 [33]	1.2E-02 [l]	3.6E-02 [35]	4.4E-04 [l]	7.1E-02 [l]	7.0E-02 [~]	0.12 [35]	1.4E-03 [l]	7.4E-02 [l]	7.3E-02 [l]	--	--	--	--
n-Decane	124-18-5	--	No	No	No	9.1E-03 [32]	142 [33]	1.2E-02 [l]	1.0E-02 [35]	1.2E-04 [l]	2.0E-02 [l]	2.2E-02 [~]	2.9E-02 [35]	3.4E-04 [l]	1.8E-02 [l]	2.0E-02 [l]	--	--	--	--
n-Undecane	1120-21-4	--	No	No	No	9.1E-03 [32]	156 [33]	1.1E-02 [l]	3.3E-03 [35]	3.6E-05 [l]	5.8E-03 [l]	7.0E-03 [~]	1.6E-02 [35]	1.8E-04 [l]	9.3E-03 [l]	1.1E-02 [l]	--	--	--	--
n-Dodecane	112-40-3	--	No	No	No	9.9E-03 [32]	170 [33]	1.1E-02 [l]	8.8E-04 [35]	9.6E-06 [l]	1.5E-03 [l]	2.0E-03 [~]	5.2E-03 [35]	5.7E-05 [l]	3.0E-03 [l]	3.9E-03 [l]	--	--	--	--
n-Tridecane	629-50-5	--	No	No	No	1.6E-02 [32]	184 [33]	1.6E-02 [l]	2.3E-04 [35]	3.8E-06 [l]	6.0E-04 [l]	8.5E-04 [~]	1.7E-03 [35]	2.7E-05 [l]	1.4E-03 [l]	2.0E-03 [l]	--	--	--	--
n-Tetradecane	629-59-4	--	No	No	No	1.2E-02 [32]	198 [33]	1.1E-02 [l]	5.9E-05 [35]	6.6E-07 [l]	1.1E-04 [l]	1.6E-04 [~]	5.1E-04 [35]	5.8E-06 [l]	3.0E-04 [l]	4.6E-04 [l]	--	--	--	--
n-Pentadecane	629-62-9	--	No	No	No	1.1E-02 [32]	212 [33]	9.4E-03 [l]	1.5E-05 [35]	1.4E-07 [l]	2.2E-05 [l]	3.6E-05 [~]	1.6E-04 [35]	1.5E-06 [l]	7.7E-05 [l]	1.3E-04 [l]	--	--	--	--
n-Hexadecane	544-76-3	--	No	No	No	1.1E-02 [32]	226 [33]	9.1E-03 [l]	3.5E-06 [35]	3.2E-08 [l]	5.2E-06 [l]	9.0E-06 [~]	4.7E-05 [35]	4.3E-07 [l]	2.3E-05 [l]	3.9E-05 [l]	--	--	--	--
Cyclohexane	110-82-7	162	Yes	No	Yes	2.2E-04 [32]	84.2 [33]	5.0E-04 [l]	1.18 [35]	5.9E-04 [l]	9.5E-02 [l]	6.2E-02 [~]	2.91 [35]	1.5E-03 [l]	7.6E-02 [l]	5.0E-02 [l]	1.7E-02 [aa]	0.20 [aa]	1.7E-02 [aa]	0.24 [aa]
Methyl cyclohexane	108-87-2	--	No	No	No	5.0E-04 [32]	98.2 [33]	9.6E-04 [l]	0.54 [35]	5.2E-04 [l]	8.4E-02 [l]	6.3E-02 [~]	1.42 [35]	1.4E-03 [l]	7.1E-02 [l]	5.4E-02 [l]	--	--	--	--
Total TAC Emission Estimates																	**0.04**	**0.44**	**0.04**	**0.53**
Total HAP Emission Estimates																	**0.02**	**0.20**	**0.02**	**0.24**
Total RBC-Only Emission Estimates																	**0.04**	**0.44**	**0.04**	**0.53**
Total Non-RBC Emission Estimates																	**0**	**0**	**0**	**0**

NOTES:
(a) Total annual or daily throughput (bbl/"unit") = (total annual or daily throughput (gal/"unit")) x (bbl/42 gal)
(b) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor (Btu/ft²-day)]]); See reference (22).
(c) Average daily maximum liquid temperature (°R) = (average daily liquid surface temperature, °R) + 0.25 x (average daily vapor temperature range, °R); See reference (15).
(d) Average daily minimum liquid temperature (°R) = (average daily liquid surface temperature, °R) - 0.25 x (average daily vapor temperature range, °R); See reference (15).
(e) True vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average daily liquid surface temperature (°R)]); See reference (9).
(f) Average daily ambient temperature range (°R) = ([daily maximum ambient temperature (°R)] - [daily minimum ambient temperature (°R)]); See reference (10).
(g) Average tank surface solar absorbance = ([tank roof surface solar absorptance] + [tank shell surface solar absorptance]) / (2); See reference (11).
(h) Average daily vapor temperature range (°R) = ([0.7] x [average daily temperature range (°R)]) + ([0.02] x [average tank surface solar absorptance] x [average daily total insolation factor (Btu/ft²-d)]); See reference (12).
(i) Vapor space expansion factor = (0.0018) x (average daily vapor temperature range [°R]); See reference (13).
(j) Effective tank diameter (ft) = ([tank length (ft)] x [tank diameter (ft)] / [π/4])^(1/2); See reference (4).
(k) For Vertical Tanks: Vapor space outage (ft) = (tank shell height [ft]) - (liquid height [ft]) + (roof outage [ft]); See reference (17).
For Horizontal Tanks: Vapor space outage (ft) = (π / 8) x (tank diameter [ft]); See reference (17).
(l) Vented vapor saturation factor = (1) / ([1] + [0.053] x [vapor pressure at average daily liquid surface temperature (psia)] x [vapor space outage (ft)]); See reference (18).
(m) Average daily ambient temperature (°R) = ([average daily maximum ambient temperature (°R)] + [average daily minimum ambient temperature (°R)]) / (2); See reference (19).
(n) If non-heated tank: Liquid bulk temperature (°R) = (average daily ambient temperature [°R]) + ([0.003] x [tank shell surface solar absorptance (°R)] x [average daily total insolation factor (Btu/ft²-day)]); See reference (20).
For heated tanks, the setpoint temperature for the storage tank is assumed to be representative of the liquid bulk temperature.
(o) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor (Btu/ft²-day)]); See reference (21).
(p) Average vapor temperature (°R) = ([2.2 x [tank shell height |ft|] / [tank diameter |ft|] + 1.1] x [average daily ambient temperature (°R)] + [0.8 x [liquid bulk temperature |°R|]] + [0.021 x [tank roof surface solar absorptance] x [average daily total insolation factor |Btu/ft²-day|]] + [0.013 x [tank shell height |ft|] / [tank diameter |ft|] x [tank shell surface solar absorptance] x [average daily total insolation factor {|Btu/ft²-day|}]) / (2.2 x [tank shell height (ft)] / [tank diameter (ft)] + 1.9); See reference (22).
(q) Stock vapor density (lb/ft³) = ([vapor molecular weight (lb/lb-mole)] x [true vapor pressure (psia)]) / ([10.731 psia-ft³/lb-mole-°R] x [average vapor temperature (°R)]); See reference (23).
(r) Annual standing loss (lb/yr) = (365) x (vapor space exp. factor per day) x ([π/4] x [diameter (ft)]²) x (vapor space outage (ft)) x (vented vapor sat. factor) x (stock vapor density [lb/ft³]) x (1 - [control efficiency (%) / 100]); See reference (24).
(s) Daily standing loss (lb/day) = (annual standing loss [lb/yr]) / (365 days/yr)
(t) Net working loss throughput (ft³/yr or ft³/day) = (5.614 ft³//bbl) x (total annual or daily throughput [bbl/yr or bbl/day]); See reference (25).
(u) Annual or daily sum of the increases in liquid level (ft/yr or ft/day) = ([5.614 ft³/bbl] x [total annual or daily throughput (bbl/yr or bbl/day)]) / ([π/4] x [tank diameter (ft)]²); See reference (26).
(v) Number of turnovers per year or day = (annual or daily sum of the increases in liquid level [ft/yr or ft/day]) / ([maximum liquid height (ft)] - [minimum liquid height (ft)]); See reference (27).
(w) If N <= 36, working loss turnover factor equal to 1, or working loss turnover factor = ([180] + [number of turnovers per year or day]) / ([6] x [number of turnovers per year or day]); See reference (28).
(x) Annual working loss (lb/yr) = (net working loss throughput [ft³/yr]) x (working loss turnover factor) x (working loss product factor) x (stock vapor density [lb/ft³]) x (vent set. correction factor) x (1- [control efficiency (%) / 100]); See reference (30).
(y) Daily working loss (lb/day) = ([vapor molecular weight (lb/lbmol) x worst case vapor pressure (psia)] / [80.273] x [worst case liquid surface temperature (R)]) x (daily filling rate [gal/day]; See reference (30).
(z) Annual or daily total tank routine losses (lb/yr or lb/day) = (annual or daily standing losses [lb/yr or lb/day]) + (annual or daily working losses [lb/yr or lb/day]); See reference (31).
(l) Liquid mole fraction of component (lb-mol/lb-mol) = (weight fraction of component in the liquid [lb/lb]) x (molecular weight of liquid stock [lb/lb-mol]) / (moleclular weight of component [lb/lb-mol]); See reference (34).
(|) Partial pressure of component (psia) = (vapor pressure [psia]) x (liquid mole fraction [lb-mol/lb-mol]); See reference (36).
(j) Vapor mole fraction of component (lb-mol/lb-mol) = (partial pressure of component [pisa]) / (total vapor pressure of liquid mixture [psia]); See reference (37).
(~) Vapor weight fraction of component (lb/lb) = (vapor mole fraction of component [lb-mol/lb-mol]) x (molecular weight of component [lb/lb-mol]) / (molecular weight of vapor stock [lb/lb-mol]); See reference (38).
(aa) Emission rate of component (lb/yr or lb/day) = (vapor weight fraction of component [lb/lb]) x (annual or daily total routine losses [lb/yr or lb/day]); See reference (39).

REFERENCES:
(1) See Table 3, Storage Tank Input Assumptions and Parameters.
(2) See Table 1, Input Process Rates and Parameters. Requested PTE based on days of kiln operation.
(3) Engineering judgement based on typical bulk storage tank design for representative industries.
(4) AP-42, Chapter 7 (June 2020); see equation 1-36. For vertical tanks, value set to 1. For horizontal tanks, value set to 0.
(5) Assumes maximum liquid surface temperature of 95°F per "TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks." Converted to degrees Rankin.
(6) Representative of average daily minimum and maximum daily temperatures for the 30-year period between 1992 and 2021 for Forest Grove, Oregon (Station ID 352997). Data obtained from the WRCC.
(7) AP-42, Chapter 7 (June 2020); Table 7.1-7. Assumes Salem, Oregon as it's the nearest city in the table to the facility .
(8) AP-42, Chapter 7 (June 2020); Table 7.1-2. Assumes chemical properties for no. 2 fuel oil (diesel) as representative.
(9) AP-42, Chapter 7 (June 2020); see equation 1-25.
(10) AP-42, Chapter 7 (June 2020); see equation 1-11.
(11) AP-42, Chapter 7 (June 2020); Table 7.1-6.
(12) AP-42, Chapter 7 (June 2020); see equation 1-7.
(13) AP-42, Chapter 7 (June 2020); see equation 1-12.
(14) AP-42, Chapter 7 (June 2020); see equation 1-16. Per equation 1-16 notes, liquid height typically assumed to be at the half full level in the absence of site-specific data.
(15) AP-42, Chapter 7 (June 2020); see equation 1-18 for cone roofs (assumes standard cone roof slope of 0.0625 ft/ft), or see equation 1-20 for dome roofs (assumes modified dome roof radius equation).
(16) AP-42, Chapter 7 (June 2020); see equation 1-17 for cone roofs, or see equation 1-19 for dome roofs.
(17) AP-42, Chapter 7 (June 2020); see equation 1-16.
(18) AP-42, Chapter 7 (June 2020); see equation 1-21. Assumes true vapor pressure as the vapor pressure at average daily liquid surface temperature.
(19) AP-42, Chapter 7 (June 2020); see equation 1-30.
(20) AP-42, Chapter 7 (June 2020); see equation 1-31.
(21) AP-42, Chapter 7 (June 2020); see equation 1-28.
(22) AP-42, Chapter 7 (June 2020); see equation 1-32. Note the simplified version of this equation (e.g. equation 1-33) was not used since HS/D is not equal to 0.5, and allows for variances in aR and aS.
(23) AP-42, Chapter 7 (June 2020); see equation 1-22.
(24) AP-42, Chapter 7 (June 2020); see equation 1-4.
(25) AP-42, Chapter 7 (June 2020); see equation 1-39.
(26) AP-42, Chapter 7 (June 2020); see equation 1-37.
(27) AP-42, Chapter 7 (June 2020); see equation 1-36.
(28) AP-42, Chapter 7 (June 2020); see notes for equation 1-37.
(29) AP-42, Chapter 7 (June 2020); see notes for equation 1-37. Assumes working loss product factor is 0.75 for crude oils, or 1 for all other organic liquids.
(30) TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Equation 1.
(31) AP-42, Chapter 7 (June 2020); see equation 1-1.
(32) See Table 4, Storage Tank Solution Compositions.
(33) Molecular weights obtained from National Institute of Standards and Technology Chemistry WebBook.
(34) AP-42, Chapter 7 (June 2020); see equation 40-4.
(35) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature.
(36) AP-42, Chapter 7 (June 2020); see equation 40-3.
(37) AP-42, Chapter 7 (June 2020); see equation 40-5.
(38) AP-42, Chapter 7 (June 2020); see equation 40-6.
(39) AP-42, Chapter 7 (June 2020); see equation 40-1.

Table 31
Resin Storage Tank (R1) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		(Units)	Storage Tank R1 (Resin)		AP-42 Variable
			2019 Actual	Requested PTE	
PRODUCTION VALUES					
Storage Tank ID	(1)	--	R1		--
Total Annual Throughput	(1)	(gal/yr)	98,132	157,853	--
Total Annual Throughput	(a)	(bbl/yr)	2,336	3,758	Q
Maximum Daily Throughput	(1)	(gal/day)	4,763	4,763	--
Maximum Daily Throughput	(a)	(bbl/day)	113	113	--
Annual Days of Operation	(2)	(days/yr)	200	365	--
TANK PROPERTIES					
Tank Type (Fixed Roof or Internal Floating Roof Tank)	(1)	--	Fixed-Roof		--
Heated or Not Heated?	(1)	--	Not Heated		--
Controlled or Fugitive?	(1)	--	Fugitive		--
Control Efficiency		(%)	0		--
Tank Roof Color	(1)	--	Aluminum-Diffuse		--
Tank Roof Condition	(1)	--	Average		--
Tank Shell Color	(1)	--	Aluminum-Diffuse		--
Tank Shell Condition	(1)	--	Average		--
Horizontal or Vertical	(1)	--	Vertical		--
Tank Diameter	(1)	(ft)	6.80		D
Tank Shell Height or Length of Horizontal Tank	(1)	(ft)	17.3		H_S
Roof Type	(3)	--	Dome		--
Maximum Liquid Height	(1)	(ft)	16.30		H_{LX}
Minimum Liquid Height	(4)	(ft)	1		H_{LN}
TANK CONTENT PROPERTIES					
Average Daily Liquid Surface Temperature	(b)	(°R)	518		T_{LA}
Maximum Liquid Surface Temperature	(5)	(°R)	555		T_{MAX}
Average Daily Maximum Liquid Temperature	(c)	(°R)	527		T_{LX}
Average Daily Minimum Liquid Temperature	(d)	(°R)	510		T_{LN}
Liquid Molecular Weight	(6)	(lb/lb-mole)	134.13		M_L
Vapor Molecular Weight	(6)	(lb/lb-mole)	134.13		M_V
True Vapor Pressure	(7)	(psia)	0.012		P_{VA}
ENVIRONMENTAL FACTORS					
Average Daily Maximum Ambient Temperature	(8)	(°R)	528		T_{AX}
Average Daily Minimum Ambient Temperature	(8)	(°R)	499		T_{AN}
Average Daily Total Insolation on a Horizontal Surface	(9)	(Btu/ft^2-day)	1,145		I
CALCULATED VARIABLES					
Standing Loss Calculations					
Average Daily Ambient Temperature Range	(f)	(°R)	29.00		ΔT_A
Tank Roof Surface Solar Absorptance	(11)	--	0.64		α_R
Tank Shell Surface Solar Absorptance	(11)	--	0.64		α_S
Average Tank Surface Solar Absorptance	(g)	--	0.64		α
Average Daily Vapor Temperature Range	(h)	(°R)	35.0		ΔT_V
Vapor Space Expansion Factor	(i)	--	0.063		K_E
Liquid Height	(14)	(ft)	8.7		H_L
Tank Shell Radius	(1)	(ft)	4.50		R_S
Tank Roof Height	(15)	(ft)	1.21		H_R
Roof Outage	(16)	(ft)	0.617		H_{RO}
Vapor Space Outage	(k)	(ft)	9.27		H_{VO}
Vented Vapor Saturation Factor	(l)	--	0.99		K_S
Average Daily Ambient Temperature	(m)	(°R)	514		T_{AA}
Liquid Bulk Temperature	(n)	(°R)	516		T_B
Average Daily Liquid Surface Temperature	(c)	(°R)	518		T_{LA}
Average Vapor Temperature	(p)	(°R)	519		T_V
Stock Vapor Density	(q)	(lb/ft^3)	2.9E-04		W_v
Annual Standing Loss	(r)	(lb/yr)	2.20		L_S
Daily Standing Loss	(s)	(lb/day)	6.0E-03		--
Working Loss Calculations					
Annual Net Working Loss Throughput	(t)	(ft^3/yr)	13,117	21,100	V_Q
Annual Sum of the Increase is Liquid Level	(u)	(ft/yr)	361	581	ΣH_{QI}
Number of Turnovers per Year	(v)	--	23.61	38.0	N
Working Loss Turnover (Saturation) Factor per Year	(w)	--	1.00	0.96	K_N
Daily Net Working Loss Throughput	(t)	(ft^3/day)	637	637	V_Q
Daily Sum of the Increase is Liquid Level	(u)	(ft/day)	17.5	17.5	ΣH_{QI}
Number of Turnovers per Day	(v)	--	1.15	1.15	N
Working Loss Turnover (Saturation) Factor per Day	(w)	--	1.00	1.00	K_N
Working Loss Product Factor	(29)	--	1.00	1.00	K_P
Vent Setting Correction Factor	(28)	--	1.00	1.00	K_B
Annual Working Loss	(x)	(lb/yr)	3.76	5.78	L_W
Daily Working Loss	(y)	(lb/day)	0.17	0.17	--
Annual Total Tank Routine Losses	**(z)**	**(lb/yr)**	**5.96**	**7.99**	**L_T**
Daily Total Tank Routine Losses	**(z)**	**(lb/day)**	**0.18**	**0.18**	**--**

All notes and references are provided on the following page. See Table 31 (Continued), Resin Storage Tank (R1) TAC Emission Estimates.

Table 31 (Continued)
Resin Storage Tank (R1) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	DEQ Sequence Number	Regulatory Category (Yes/No)			Physical Characteristics			EPA Tanks Methodology (Annual Calculations)				EPA Tanks Methodology (Daily Calculations)				Emissions Estimate			
						Z_{li}	M_i	x_i	P	P_i	y_i	Z_{Vi}	P	P_i	y_i	Z_{Vi}	L_{Ti} (2019 Actual)		L_{Ti} (Requested PTE)	
			TAC	HAP	RBC	Liquid Weight Fraction	Molecular Weight (lb/lb-mol)	Liquid Mole Fraction	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Maximum Daily (lb/day)	Annual (lb/yr)	Maximum Daily (lb/day)	Annual (lb/yr)
Phenol	108-95-2	497	Yes	Yes	Yes	1.0E-03 (32)	94.11 (33)	1.4E-03 (f)	2.7E-03 (35)	3.8E-06 (r)	3.2E-04 (f)	2.3E-04 (t)	1.6E-02 (39)	2.2E-05 (r)	1.9E-03 (f)	1.3E-03 (t)	2.3E-04 (aa)	1.4E-03 (aa)	2.3E-04 (aa)	1.8E-03 (aa)
Formaldehyde	50-00-0	250	Yes	Yes	Yes	1.0E-03 (32)	30.03 (33)	4.5E-03 (f)	53.8 (35)	2.4E-01 (r)	20.2 (f)	1.00 (t)	99.3 (39)	4.4E-01 (r)	3.7E+01 (f)	1.00 (t)	0.18 (aa)	5.96 (aa)	0.18 (aa)	8.0 (aa)
Total TAC Emission Estimates																	**0.18**	**6.0**	**0.18**	**8.0**
Total HAP Emission Estimates																	**0.18**	**6.0**	**0.18**	**8.0**

NOTES:

(a) Total annual or daily throughput (bbl/"unit") = (total annual or daily throughput [gal/"unit"]) x (bbl/42 gal)

(b) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]); See reference (22).

(c) Average daily maximum liquid temperature (°R) = (average daily liquid surface temperature, °R) + 0.25 x (average daily vapor temperature range, °R); See reference .

(d) Average daily minimum liquid temperature (°R) = (average daily liquid surface temperature, °R) - 0.25 x (average daily vapor temperature range, °R); See reference .

(e) True vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average daily liquid surface temperature (°R)]); See reference (35).

(f) Average daily ambient temperature range (°R) = ([daily maximum ambient temperature (°R)] - [daily minimum ambient temperature (°R)]); See reference (10).

(g) Average tank surface solar absorbance = ([tank roof surface solar absorptance] + [tank shell surface solar absorptance]) / (2); See reference (11).

(h) Average daily vapor temperature range (°R) = ([0.7] x [average daily temperature range (°R)]) + ([0.02] x [average tank surface solar absorptance] x [average daily total insolation factor {Btu/ft²-d}]); See reference (12).

(i) Vapor space expansion factor = (0.0018) x (average daily vapor temperature range [°R]); See reference (13).

(j) Effective tank diameter (ft) = ([tank length {ft}] x [tank diameter {ft}] / [π/4])^(1/2); See reference (4).

(k) For Vertical Tanks: Vapor space outage (ft) = (tank shell height [ft]) - (liquid height [ft]) + (roof outage [ft]); See reference (17).
For Horizontal Tanks: Vapor space outage (ft) = (π / 8) x (tank diameter [ft]); See reference (17).

(l) Vented vapor saturation factor = (1) / ([1] + [0.053] x [vapor pressure at average daily liquid surface temperature {psia}] x [vapor space outage {ft}]); See reference (18).

(m) Average daily ambient temperature (°R) = ([average daily maximum ambient temperature (°R)] + [average daily minimum ambient temperature (°R)]) / (2); See reference (19).

(n) If non-heated tank: Liquid bulk temperature (°R) = (average daily ambient temperature (°R)) + ([0.003] x [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]); See reference (20).
For heated tanks, the setpoint temperature for the storage tank is assumed to be representative of the liquid bulk temperature.

(o) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]; See reference (21).

(p) Average vapor temperature (°R) = ([2.2 x {tank shell height |ft|} / {tank diameter |ft|} + 1.1] x [average daily ambient temperature (°R)] + [0.8 x {liquid bulk temperature |°R|}] + [0.021 x {tank roof surface solar absorptance} x {average daily total insolation factor |Btu/ft²-day|}] + [0.013 x {tank shell height |ft|} / {tank diameter |ft|} x {tank shell surface solar absorptance} x {average daily total insolation factor {|Btu/ft²-day|}}] / (2.2 x {tank shell height {ft}} / {tank diameter {ft}} + 1.9); See reference (22).

(q) Stock vapor density (lb/ft³) = ([vapor molecular weight {lb/lb-mole}] x [true vapor pressure {psia}]) / ([10.731 psia-ft³/lb-mole-°R] x [average vapor temperature (°R)]); See reference (23).

(r) Annual standing loss (lb/yr) = (365) x (vapor space exp. factor per day) x ([π/4] x [diameter {ft}]²) x (vapor space outage [ft]) x (vented vapor sat. factor) x (stock vapor density [lb/ft³]) x (1 - [control efficiency (%) / 100]); See reference (24).

(s) Daily standing loss (lb/day) = (annual standing loss [lb/yr]) / (365 days/yr)

(t) Net working loss throughput (ft³/yr or ft³/day) = (5.614 ft³//bbl) x (total annual or daily throughput [bbl/yr or bbl/day]); See reference (25).

(u) Annual or daily sum of the increases in liquid level (ft/yr or ft/day) = ([5.614 ft³/bbl] x [total annual or daily throughput {bbl/yr or bbl/day}]) / ([π/4] x [tank diameter {ft}]²); See reference (26).

(v) Number of turnovers per year or day = (annual or daily sum of the increases in liquid level [ft/yr or ft/day]) / ([maximum liquid height {ft}] - [minimum liquid height {ft}]); See reference (27).

(w) If N <= 36, working loss turnover factor equal to 1, or working loss turnover factor = ([180] + [number of turnovers per year or day]) / ([6] x [number of turnovers per year or day]); See reference (28).

(x) Annual working loss (lb/yr) = (net working loss throughput [ft³/yr]) x (working loss turnover factor) x (working loss product factor) x (stock vapor density [lb/ft³]) x (vent set. correction factor) x (1- [control efficiency (%) / 100]); See reference (30).

(y) Daily working loss (lb/day) = ([vapor molecular weight (lb/lbmol) x worst case vapor pressure (psia)] / [80.273] x [worst case liquid surface temperature (R)]) x (daily filling rate [gal/day]; See reference (30).

(z) Annual or daily total tank routine losses (lb/yr or lb/day) = (annual or daily standing losses [lb/yr or lb/day]) + (annual or daily working losses [lb/yr or lb/day]); See reference (31).

({) Liquid mole fraction of component (lb-mol/lb-mol) = (weight fraction of component in the liquid [lb/lb]) x (molecular weight of liquid stock [lb/lb-mol]) / (moleclular weight of component [lb/lb-mol]); See reference (34).

(|) Partial pressure of component (psia) = (vapor pressure [psia]) x (liquid mole fraction [lb-mol/lb-mol]); See reference (36).

(}) Vapor weight fraction of component (lb/lb) = (vapor mole fraction of component [lb-mol/lb-mol]) x (molecular weight of component [lb/lb-mol]) / (molecular weight of vapor stock [lb/lb-mol]); See reference (38).

(aa) Emission rate of component (lb/yr or lb/day) = (vapor weight fraction of component [lb/lb]) x (annual or daily total routine losses [lb/yr or lb/day]); See reference (40).

REFERENCES:

(1) See Table 3, Storage Tank Input Assumptions and Parameters.
(2) See Table 1, Input Process Rates and Parameters. Requested PTE based on days of kiln operation.
(3) Engineering judgement based on typical bulk storage tank design for representative industries.
(4) AP-42, Chapter 7 (June 2020); see equation 1-36. For vertical tanks, value set to 1. For horizontal tanks, value set to 0.
(5) Assumes maximum liquid surface temperature of 95°F per "TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks." Converted to degrees Rankin.
(6) Liquid molecular weight obtained from the National Center for Biotechnology Information, PubChem online chemistry database. Representative of phenol-formaldehyde resin. Vapor molecular weight is assumed as as liquid.
(7) Vapor pressure of phenol resin at 25°C. Converted from mmHg to psia. Value obtained online at "https://blog.oureducation.in/phenolic-resin-properties-of-phenol-formaldehyde/".
(8) Representative of average daily minimum and maximum daily temperatures for the 30-year period between 1992 and 2021 for Forest Grove, Oregon (Station ID 352997). Data obtained from the WRCC.
(9) AP-42, Chapter 7 (June 2020); Table 7.1-7. Assumes Salem, Oregon as it's the nearest city in the table to the facility .
(10) AP-42, Chapter 7 (June 2020); see equation 1-11.
(11) AP-42, Chapter 7 (June 2020); Table 7.1-6.
(12) AP-42, Chapter 7 (June 2020); see equation 1-7.
(13) AP-42, Chapter 7 (June 2020); see equation 1-12.
(14) AP-42, Chapter 7 (June 2020); see equation 1-16. Per equation 1-16 notes, liquid height typically assumed to be at the half full level in the absence of site-specific data.
(15) AP-42, Chapter 7 (June 2020); see equation 1-18 for cone roofs (assumes standard cone roof slope of 0.0625 ft/ft), or see equation 1-20 for dome roofs (assumes modified dome roof radius equation).
(16) AP-42, Chapter 7 (June 2020); see equation 1-17 for cone roofs, or see equation 1-19 for dome roofs.
(17) AP-42, Chapter 7 (June 2020); see equation 1-16.
(18) AP-42, Chapter 7 (June 2020); see equation 1-21. Assumes true vapor pressure as the vapor pressure at average daily liquid surface temperature.
(19) AP-42, Chapter 7 (June 2020); see equation 1-30.
(20) AP-42, Chapter 7 (June 2020); see equation 1-31.
(21) AP-42, Chapter 7 (June 2020); see equation 1-28.
(22) AP-42, Chapter 7 (June 2020); see equation 1-32. Note the simplified version of this equation (e.g. equation 1-33) was not used since HS/D is not equal to 0.5, and allows for variances in aR and aS.
(23) AP-42, Chapter 7 (June 2020); see equation 1-22.
(24) AP-42, Chapter 7 (June 2020); see equation 1-4.
(25) AP-42, Chapter 7 (June 2020); see equation 1-39.
(26) AP-42, Chapter 7 (June 2020); see equation 1-37.
(27) AP-42, Chapter 7 (June 2020); see equation 1-36.
(28) AP-42, Chapter 7 (June 2020); see notes for equation 1-35.
(29) AP-42, Chapter 7 (June 2020); see notes for equation 1-35. Assumes working loss product factor is 0.75 for crude oils, or 1 for all other organic liquids.
(30) TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Equation 1.
(31) AP-42, Chapter 7 (June 2020); see equation 1-1.
(32) See Table 4, Storage Tank Solution Compositions.
(33) Molecular weights obtained from National Institute of Standards and Technology Chemistry WebBook.
(34) AP-42, Chapter 7 (June 2020); see equation 40-4.
(35) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 519 °R.
(36) AP-42, Chapter 7 (June 2020); see equation 40-3.
(37) AP-42, Chapter 7 (June 2020); see equation 40-5.
(38) AP-42, Chapter 7 (June 2020); see equation 40-6.
(39) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 519 °R.
(40) AP-42, Chapter 7 (June 2020); see equation 40-1.

Table 32
Resin Storage Tank (R2) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		(Units)	Storage Tank R2 (Resin)		AP-42 Variable
			2019 Actual	Requested PTE	
PRODUCTION VALUES					
Storage Tank ID	(1)	--	R2		--
Total Annual Throughput	(1)	(gal/yr)	98,132	157,853	--
Total Annual Throughput	(a)	(bbl/yr)	2,336	3,758	Q
Maximum Daily Throughput	(1)	(gal/day)	5,195	5,195	--
Maximum Daily Throughput	(a)	(bbl/day)	124	124	--
Annual Days of Operation	(2)	(days/yr)	200	365	--
TANK PROPERTIES					
Tank Type (Fixed Roof or Internal Floating Roof Tank)	(1)	--	Fixed-Roof		--
Heated or Not Heated?	(1)	--	Not Heated		--
Controlled or Fugitive?	(1)	--	Fugitive		--
Control Efficiency		(%)	0		--
Tank Roof Color	(1)	--	Aluminum-Diffuse		--
Tank Roof Condition	(1)	--	Average		--
Tank Shell Color	(1)	--	Aluminum-Diffuse		--
Tank Shell Condition	(1)	--	Average		--
Horizontal or Vertical	(1)	--	Vertical		--
Tank Diameter	(1)	(ft)	6.80		D
Tank Shell Height or Length of Horizontal Tank	(1)	(ft)	17.3		H_S
Roof Type	(3)	--	Dome		--
Maximum Liquid Height	(1)	(ft)	16.30		H_{LX}
Minimum Liquid Height	(4)	(ft)	1		H_{LN}
TANK CONTENT PROPERTIES					
Average Daily Liquid Surface Temperature	(b)	(°R)	518		T_{LA}
Maximum Liquid Surface Temperature	(5)	(°R)	555		T_{MAX}
Average Daily Maximum Liquid Temperature	(c)	(°R)	527		T_{LX}
Average Daily Minimum Liquid Temperature	(d)	(°R)	510		T_{LN}
Liquid Molecular Weight	(6)	(lb/lb-mole)	134.13		M_L
Vapor Molecular Weight	(6)	(lb/lb-mole)	134.13		M_V
True Vapor Pressure	(7)	(psia)	0.012		P_{VA}
ENVIRONMENTAL FACTORS					
Average Daily Maximum Ambient Temperature	(8)	(°R)	528		T_{AX}
Average Daily Minimum Ambient Temperature	(8)	(°R)	499		T_{AN}
Average Daily Total Insolation on a Horizontal Surface	(9)	(Btu/ft^2-day)	1,145		I
CALCULATED VARIABLES					
Standing Loss Calculations					
Average Daily Ambient Temperature Range	(f)	(°R)	29.00		ΔT_A
Tank Roof Surface Solar Absorptance	(11)	--	0.64		α_R
Tank Shell Surface Solar Absorptance	(11)	--	0.64		α_S
Average Tank Surface Solar Absorptance	(g)	--	0.64		α
Average Daily Vapor Temperature Range	(h)	(°R)	35.0		ΔT_V
Vapor Space Expansion Factor	(i)	--	0.063		K_E
Liquid Height	(14)	(ft)	8.7		H_L
Tank Shell Radius	(1)	(ft)	4.50		R_S
Tank Roof Height	(15)	(ft)	1.21		H_R
Roof Outage	(16)	(ft)	0.617		H_{RO}
Vapor Space Outage	(k)	(ft)	9.27		H_{VO}
Vented Vapor Saturation Factor	(l)	--	0.99		K_S
Average Daily Ambient Temperature	(m)	(°R)	514		T_{AA}
Liquid Bulk Temperature	(n)	(°R)	516		T_B
Average Daily Liquid Surface Temperature	(o)	(°R)	518		T_{LA}
Average Vapor Temperature	(p)	(°R)	519		T_V
Stock Vapor Density	(q)	(lb/ft^3)	2.9E-04		W_v
Annual Standing Loss	(r)	(lb/yr)	2.20		L_S
Daily Standing Loss	(s)	(lb/day)	6.0E-03		--
Working Loss Calculations					
Annual Net Working Loss Throughput	(t)	(ft^3/yr)	13,117	21,100	V_Q
Annual Sum of the Increase is Liquid Level	(u)	(ft/yr)	361	581	ΣH_{QI}
Number of Turnovers per Year	(v)	--	23.61	38.0	N
Working Loss Turnover (Saturation) Factor per Year	(w)	--	1.00	0.96	K_N
Daily Net Working Loss Throughput	(t)	(ft^3/day)	694	694	V_Q
Daily Sum of the Increase is Liquid Level	(u)	(ft/day)	19.1	19.1	ΣH_{QI}
Number of Turnovers per Day	(v)	--	1.25	1.25	N
Working Loss Turnover (Saturation) Factor per Day	(w)	--	1.00	1.00	K_N
Working Loss Product Factor	(29)	--	1.00	1.00	K_P
Vent Setting Correction Factor	(28)	--	1.00	1.00	K_B
Annual Working Loss	(x)	(lb/yr)	3.76	5.78	L_W
Daily Working Loss	(y)	(lb/day)	0.19	0.19	--
Annual Total Tank Routine Losses	**(z)**	**(lb/yr)**	**5.96**	**7.99**	**L_T**
Daily Total Tank Routine Losses	**(z)**	**(lb/day)**	**0.19**	**0.19**	**--**

All notes and references are provided on the following page. See Table 32 (Continued), Resin Storage Tank (R2) TAC Emission Estimates.

Table 32 (Continued)
Resin Storage Tank (R2) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	DEQ Sequence Number	Regulatory Category (Yes/No)			Physical Characteristics			EPA Tanks Methodology (Annual Calculations)				EPA Tanks Methodology (Daily Calculations)				Emissions Estimate			
						Z_{ll}	M_i	x_i	P	P_i	y_i	Z_{Vi}	P	P_i	y_i	Z_{Vi}	L_{Ti} (2019 Actual)		L_{Ti} (Requested PTE)	
			TAC	HAP	RBC	Liquid Weight Fraction	Molecular Weight (lb/lb-mol)	Liquid Mole Fraction	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Maximum Daily (lb/day)	Annual (lb/yr)	Maximum Daily (lb/day)	Annual (lb/yr)
Phenol	108-95-2	497	Yes	Yes	Yes	1.0E-03 [32]	94.11 [33]	1.4E-03 [f]	2.7E-03 [35]	3.8E-06 [l]	3.2E-04 [f]	2.3E-04 [j]	1.6E-02 [39]	2.2E-05 [l]	1.9E-03 [f]	1.3E-03 [j]	2.5E-04 [aa]	1.4E-03 [aa]	2.5E-04 [aa]	1.8E-03 [aa]
Formaldehyde	50-00-0	250	Yes	Yes	Yes	1.0E-03 [32]	30.03 [33]	4.5E-03 [f]	53.8 [35]	2.4E-01 [l]	2.0E+01 [f]	1.00 [j]	99.3 [39]	4.4E-01 [l]	3.7E+01 [f]	1.00 [j]	0.19 [aa]	5.96 [aa]	0.19 [aa]	8.0 [aa]
Total TAC Emission Estimates																	**0.19**	**6.0**	**0.19**	**8.0**
Total HAP Emission Estimates																	**0.19**	**6.0**	**0.19**	**8.0**

NOTES:

(a) Total annual or daily throughput (bbl/"unit") = (total annual or daily throughput [gal/"unit"]) x (bbl/42 gal)

(b) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]); See reference (22).

(c) Average daily maximum liquid temperature (°R) = (average daily liquid surface temperature, °R) + 0.25 x (average daily vapor temperature range, °R); See reference .

(d) Average daily minimum liquid temperature (°R) = (average daily liquid surface temperature, °R) - 0.25 x (average daily vapor temperature range, °R); See reference .

(e) True vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average daily liquid surface temperature (°R)]); See reference (35).

(f) Average daily ambient temperature range (°R) = ([daily maximum ambient temperature (°R)] - [daily minimum ambient temperature (°R)]); See reference (10).

(g) Average tank surface solar absorbance = ([tank roof surface solar absorptance] + [tank shell surface solar absorptance]) / (2); See reference (11).

(h) Average daily vapor temperature range (°R) = ([0.7] x [average daily temperature range (°R)]) + ([0.02] x [average tank surface solar absorptance] x [average daily total insolation factor {Btu/ft²-d}]); See reference (12).

(i) Vapor space expansion factor = (0.0018) x (average daily vapor temperature range [°R]); See reference (13).

(j) Effective tank diameter (ft) = ([tank length {ft}] x [tank diameter {ft}] / [π/4])^(1/2); See reference (4).

(k) For Vertical Tanks: Vapor space outage (ft) = (tank shell height [ft]) - (liquid height [ft]) + (roof outage [ft]); See reference (17).
For Horizontal Tanks: Vapor space outage (ft) = (π / 8) x (tank diameter [ft]); See reference (17).

(l) Vented vapor saturation factor = (1) / ([1] + [0.053] x [vapor pressure at average daily liquid surface temperature {psia}] x [vapor space outage {ft}]); See reference (18).

(m) Average daily ambient temperature (°R) = ([average daily maximum ambient temperature (°R)] + [average daily minimum ambient temperature (°R)]) / (2); See reference (19).

(n) If non-heated tank: Liquid bulk temperature (°R) = (average daily ambient temperature (°R)) + ([0.003] x [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]); See reference (20).
For heated tanks, the setpoint temperature for the storage tank is assumed to be representative of the liquid bulk temperature.

(o) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature (°R)]) + ([0.6] x [liquid bulk temerature (°R)) + ([0.005] X [tank shell surface solar absorptance (°R)] x [average daily total insolation factor {Btu/ft²-day}]; See reference (21).

(p) Average vapor temperature (°R) = ([2.2 x {tank shell height |ft|} / {tank diameter |ft|} + 1.1] x [average daily ambient temperature (°R)] + [0.8 x {liquid bulk temperature |°R|}] + [0.021 x {tank roof surface solar absorptance} x {average daily total insolation factor |Btu/ft²-day|}] + [0.013 x {tank shell height |ft|} / {tank diameter |ft|} x {tank shell surface solar absorptance} x {average daily total insolation factor {|Btu/ft²-day|}}] / (2.2 x [tank shell height {ft}] / [tank diameter {ft}] + 1.9); See reference (22).

(q) Stock vapor density (lb/ft³) = ([vapor molecular weight {lb/lb-mole}] x [true vapor pressure {psia}]) / ([10.731 psia-ft³/lb-mole-°R] x [average vapor temperature (°R)]); See reference (23).

(r) Annual standing loss (lb/yr) = (365) x (vapor space exp. factor per day) x ([π/4] x [diameter {ft}]²) x (vapor space outage [ft]) x (vented vapor sat. factor) x (stock vapor density [lb/ft³]) x (1 - [control efficiency (%) / 100]); See reference (24).

(s) Daily standing loss (lb/day) = (annual standing loss [lb/yr]) / (365 days/yr)

(t) Net working loss throughput (ft³/yr or ft³/day) = (5.614 ft³//bbl) x (total annual or daily throughput [bbl/yr or bbl/day]); See reference (25).

(u) Annual or daily sum of the increases in liquid level (ft/yr or ft/day) = ([5.614 ft³/bbl] x [total annual or daily throughput {bbl/yr or bbl/day}]) / ([π/4] x [tank diameter {ft}]²); See reference (26).

(v) Number of turnovers per year or day = (annual or daily sum of the increases in liquid level [ft/yr or ft/day]) / ([maximum liquid height {ft}] - [minimum liquid height {ft}]); See reference (27).

(w) If N <= 36, working loss turnover factor equal to 1, or working loss turnover factor = ([180] + [number of turnovers per year or day]) / ([6] x [number of turnovers per year or day]); See reference (28).

(x) Annual working loss (lb/yr) = (net working loss throughput [ft³/yr]) x (working loss turnover factor) x (working loss product factor) x (stock vapor density [lb/ft³]) x (vent set. correction factor) x (1- [control efficiency (%) / 100]); See reference (30).

(y) Daily working loss (lb/day) = ([vapor molecular weight (lb/lbmol) x worst case vapor pressure (psia)] / [80.273] x [worst case liquid surface temperature (R)]) x (daily filling rate [gal/day]; See reference (30).

(z) Annual or daily total tank routine losses (lb/yr or lb/day) = (annual or daily standing losses [lb/yr or lb/day]) + (annual or daily working losses [lb/yr or lb/day]); See reference (31).

({) Liquid mole fraction of component (lb-mol/lb-mol) = (weight fraction of component in the liquid [lb/lb]) x (molecular weight of liquid stock [lb/lb-mol]) / (moleclular weight of component [lb/lb-mol]); See reference (34).

(|) Partial pressure of component (psia) = (vapor pressure [psia]) x (liquid mole fraction [lb-mol/lb-mol]); See reference (36).

(}) Vapor weight fraction of component (lb/lb) = (vapor mole fraction of component [lb-mol/lb-mol]) x (molecular weight of component [lb/lb-mol]) / (molecular weight of vapor stock [lb/lb-mol]); See reference (38).

(aa) Emission rate of component (lb/yr or lb/day) = (vapor weight fraction of component [lb/lb]) x (annual or daily total routine losses [lb/yr or lb/day]); See reference (40).

REFERENCES:

(1) See Table 3, Storage Tank Input Assumptions and Parameters.
(2) See Table 1, Input Process Rates and Parameters. Requested PTE based on days of kiln operation.
(3) Engineering judgement based on typical bulk storage tank design for representative industries.
(4) AP-42, Chapter 7 (June 2020); see equation 1-36. For vertical tanks, value set to 1. For horizontal tanks, value set to 0.
(5) Assumes maximum liquid surface temperature of 95°F per "TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks." Converted to degrees Rankin.
(6) Liquid molecular weight obtained from the National Center for Biotechnology Information, PubChem online chemistry database. Representative of phenol-formaldehyde resin. Vapor molecular weight is assumed as as liquid.
(7) Vapor pressure of phenol resin at 25°C. Converted from mmHg to psia. Value obtained online at "https://blog.oureducation.in/phenolic-resin-properties-of-phenol-formaldehyde/".
(8) Representative of average daily minimum and maximum daily temperatures for the 30-year period between 1992 and 2021 for Forest Grove, Oregon (Station ID 352997). Data obtained from the WRCC.
(9) AP-42, Chapter 7 (June 2020); Table 7.1-7. Assumes Salem, Oregon as it's the nearest city in the table to the facility .
(10) AP-42, Chapter 7 (June 2020); see equation 1-11.
(11) AP-42, Chapter 7 (June 2020); Table 7.1-6.
(12) AP-42, Chapter 7 (June 2020); see equation 1-7.
(13) AP-42, Chapter 7 (June 2020); see equation 1-12.
(14) AP-42, Chapter 7 (June 2020); see equation 1-16. Per equation 1-16 notes, liquid height typically assumed to be at the half full level in the absence of site-specific data.
(15) AP-42, Chapter 7 (June 2020); see equation 1-18 for cone roofs (assumes standard cone roof slope of 0.0625 ft/ft), or see equation 1-20 for dome roofs (assumes modified dome roof radius equation).
(16) AP-42, Chapter 7 (June 2020); see equation 1-17 for cone roofs, or see equation 1-19 for dome roofs.
(17) AP-42, Chapter 7 (June 2020); see equation 1-16.
(18) AP-42, Chapter 7 (June 2020); see equation 1-21. Assumes true vapor pressure as the vapor pressure at average daily liquid surface temperature.
(19) AP-42, Chapter 7 (June 2020); see equation 1-30.
(20) AP-42, Chapter 7 (June 2020); see equation 1-31.
(21) AP-42, Chapter 7 (June 2020); see equation 1-28.
(22) AP-42, Chapter 7 (June 2020); see equation 1-32. Note the simplified version of this equation (e.g. equation 1-33) was not used since HS/D is not equal to 0.5, and allows for variances in aR and aS.
(23) AP-42, Chapter 7 (June 2020); see equation 1-22.
(24) AP-42, Chapter 7 (June 2020); see equation 1-4.
(25) AP-42, Chapter 7 (June 2020); see equation 1-39.
(26) AP-42, Chapter 7 (June 2020); see equation 1-37.
(27) AP-42, Chapter 7 (June 2020); see equation 1-36.
(28) AP-42, Chapter 7 (June 2020); see notes for equation 1-35.
(29) AP-42, Chapter 7 (June 2020); see notes for equation 1-35. Assumes working loss product factor is 0.75 for crude oils, or 1 for all other organic liquids.
(30) TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Equation 1.
(31) AP-42, Chapter 7 (June 2020); see equation 1-1.
(32) See Table 4, Storage Tank Solution Compositions.
(33) Molecular weights obtained from National Institute of Standards and Technology Chemistry WebBook.
(34) AP-42, Chapter 7 (June 2020); see equation 40-4.
(35) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 519 °R.
(36) AP-42, Chapter 7 (June 2020); see equation 40-3.
(37) AP-42, Chapter 7 (June 2020); see equation 40-5.
(38) AP-42, Chapter 7 (June 2020); see equation 40-6.
(39) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 519 °R.
(40) AP-42, Chapter 7 (June 2020); see equation 40-1.

Table 33
Resin Storage Tank (R3) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		(Units)	Storage Tank R3 (Resin)		AP-42 Variable
			2019 Actual	Requested PTE	
PRODUCTION VALUES					
Storage Tank ID	(1)	--	R3		--
Total Annual Throughput	(1)	(gal/yr)	98,132	157,853	--
Total Annual Throughput	(a)	(bbl/yr)	2,336	3,758	Q
Maximum Daily Throughput	(1)	(gal/day)	5,223	5,223	--
Maximum Daily Throughput	(a)	(bbl/day)	124	124	--
Annual Days of Operation	(2)	(days/yr)	200	365	--
TANK PROPERTIES					
Tank Type (Fixed Roof or Internal Floating Roof Tank)	(1)	--	Fixed-Roof		--
Heated or Not Heated?	(1)	--	Not Heated		--
Controlled or Fugitive?	(1)	--	Fugitive		--
Control Efficiency		(%)	0		--
Tank Roof Color	(1)	--	Aluminum-Diffuse		--
Tank Roof Condition	(1)	--	Average		--
Tank Shell Color	(1)	--	Aluminum-Diffuse		--
Tank Shell Condition	(1)	--	Average		--
Horizontal or Vertical	(1)	--	Vertical		--
Tank Diameter	(1)	(ft)	6.80		D
Tank Shell Height or Length of Horizontal Tank	(1)	(ft)	17.3		H_S
Roof Type	(3)	--	Dome		--
Maximum Liquid Height	(1)	(ft)	16.30		H_{LX}
Minimum Liquid Height	(4)	(ft)	1		H_{LN}
TANK CONTENT PROPERTIES					
Average Daily Liquid Surface Temperature	(b)	(°R)	518		T_{LA}
Maximum Liquid Surface Temperature	(5)	(°R)	555		T_{MAX}
Average Daily Maximum Liquid Temperature	(c)	(°R)	527		T_{LX}
Average Daily Minimum Liquid Temperature	(d)	(°R)	510		T_{LN}
Liquid Molecular Weight	(6)	(lb/lb-mole)	134.13		M_L
Vapor Molecular Weight	(6)	(lb/lb-mole)	134.13		M_V
True Vapor Pressure	(7)	(psia)	0.012		P_{VA}
ENVIRONMENTAL FACTORS					
Average Daily Maximum Ambient Temperature	(8)	(°R)	528		T_{AX}
Average Daily Minimum Ambient Temperature	(8)	(°R)	499		T_{AN}
Average Daily Total Insolation on a Horizontal Surface	(9)	(Btu/ft^2-day)	1,145		I
CALCULATED VARIABLES					
Standing Loss Calculations					
Average Daily Ambient Temperature Range	(f)	(°R)	29.00		ΔT_A
Tank Roof Surface Solar Absorptance	(11)	--	0.64		a_R
Tank Shell Surface Solar Absorptance	(11)	--	0.64		a_S
Average Tank Surface Solar Absorptance	(g)	--	0.64		a
Average Daily Vapor Temperature Range	(h)	(°R)	35.0		ΔT_V
Vapor Space Expansion Factor	(i)	--	0.063		K_E
Liquid Height	(14)	(ft)	8.7		H_L
Tank Shell Radius	(1)	(ft)	4.50		R_S
Tank Roof Height	(15)	(ft)	1.21		H_R
Roof Outage	(16)	(ft)	0.617		H_{RO}
Vapor Space Outage	(k)	(ft)	9.27		H_{VO}
Vented Vapor Saturation Factor	(l)	--	0.99		K_S
Average Daily Ambient Temperature	(m)	(°R)	514		T_{AA}
Liquid Bulk Temperature	(n)	(°R)	516		T_B
Average Daily Liquid Surface Temperature	(o)	(°R)	518		T_{LA}
Average Vapor Temperature	(p)	(°R)	519		T_V
Stock Vapor Density	(q)	(lb/ft^3)	2.9E-04		W_V
Annual Standing Loss	(r)	(lb/yr)	2.20		L_S
Daily Standing Loss	(s)	(lb/day)	6.0E-03		--
Working Loss Calculations					
Annual Net Working Loss Throughput	(t)	(ft^3/yr)	13,117	21,100	V_Q
Annual Sum of the Increase is Liquid Level	(u)	(ft/yr)	361	581	ΣH_{QI}
Number of Turnovers per Year	(v)	--	23.61	38.0	N
Working Loss Turnover (Saturation) Factor per Year	(w)	--	1.00	0.96	K_N
Daily Net Working Loss Throughput	(t)	(ft^3/day)	698	698	V_Q
Daily Sum of the Increase is Liquid Level	(u)	(ft/day)	19.2	19.2	ΣH_{QI}
Number of Turnovers per Day	(v)	--	1.26	1.26	N
Working Loss Turnover (Saturation) Factor per Day	(w)	--	1.00	1.00	K_N
Working Loss Product Factor	(29)	--	1.00	1.00	K_P
Vent Setting Correction Factor	(28)	--	1.00	1.00	K_B
Annual Working Loss	(x)	(lb/yr)	3.76	5.78	L_W
Daily Working Loss	(y)	(lb/day)	0.19	0.19	--
Annual Total Tank Routine Losses	**(z)**	**(lb/yr)**	**5.96**	**7.99**	**L_T**
Daily Total Tank Routine Losses	**(z)**	**(lb/day)**	**0.19**	**0.19**	**--**

All notes and references are provided on the following page. See Table 33 (Continued), Resin Storage Tank (R3) TAC Emission Estimates.

Table 33 (Continued)
Resin Storage Tank (R3) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	DEQ Sequence Number	Regulatory Category (Yes/No)			Physical Characteristics			EPA Tanks Methodology (Annual Calculations)				EPA Tanks Methodology (Daily Calculations)				Emissions Estimate			
						Z_{li}	M_l	x_i	P	P_i	y_i	Z_{vi}	P	P_i	y_i	Z_{vi}	L_{ti} (2019 Actual)		L_{ti} (Requested PTE)	
			TAC	HAP	RBC	Liquid Weight Fraction	Molecular Weight (lb/lb-mol)	Liquid Mole Fraction	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Maximum Daily (lb/day)	Annual (lb/yr)	Maximum Daily (lb/day)	Annual (lb/yr)
Phenol	108-95-2	497	Yes	Yes	Yes	1.0E-03 (32)	94.11 (33)	1.4E-03 (l)	2.7E-03 (35)	3.8E-06 (l)	3.2E-04 (l)	2.3E-04 (j)	1.6E-02 (39)	2.2E-05 (l)	1.9E-03 (l)	1.3E-03 (j)	2.5E-04 (aa)	1.4E-03 (aa)	2.5E-04 (aa)	1.8E-03 (aa)
Formaldehyde	50-00-0	250	Yes	Yes	Yes	1.0E-03 (32)	30.03 (33)	4.5E-03 (l)	53.8 (35)	2.4E-01 (l)	20.2 (l)	1.00 (j)	99.3 (39)	4.4E-01 (l)	3.7E+01 (l)	1.00 (j)	0.19 (aa)	5.96 (aa)	0.19 (aa)	8.0 (aa)
Total TAC Emission Estimates																	**0.19**	**6.0**	**0.19**	**8.0**
Total HAP Emission Estimates																	**0.19**	**6.0**	**0.19**	**8.0**

NOTES:

(a) Total annual or daily throughput (bbl/"unit") = (total annual or daily throughput [gal/"unit"]) x (bbl/42 gal)

(b) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature {°R}]) + ([0.6] x [liquid bulk temerature {°R}) + ([0.005] X [tank shell surface solar absorptance {°R}] x [average daily total insolation factor {Btu/ft²-day}]); See reference (22).

(c) Average daily maximum liquid temperature (°R) = (average daily liquid surface temperature, °R) + 0.25 x (average daily vapor temperature range, °R); See reference .

(d) Average daily minimum liquid temperature (°R) = (average daily liquid surface temperature, °R) - 0.25 x (average daily vapor temperature range, °R); See reference .

(e) True vapor pressure (psia) = exp([vapor pressure equation constant A] - [vapor pressure constant equation B] / [average daily liquid surface temperature {°R}]); See reference (35).

(f) Average daily ambient temperature range (°R) = ([daily maximum ambient temperature {°R}] - [daily minimum ambient temperature {°R}]); See reference (10).

(g) Average tank surface solar absorbance = ([tank roof surface solar absorptance] + [tank shell surface solar absorptance]) / (2); See reference (11).

(h) Average daily vapor temperature range (°R) = ([0.7] x [average daily temperature range {°R}]) + ([0.02] x [average tank surface solar absorptance] x [average daily total insolation factor {Btu/ft²-d}]); See reference (12).

(i) Vapor space expansion factor = (0.0018) x (average daily vapor temperature range [°R]); See reference (13).

(j) Effective tank diameter (ft) = ([tank length {ft}] x [tank diameter {ft}] / [π/4]^(1/2); See reference (4).

(k) For Vertical Tanks: Vapor space outage (ft) = (tank shell height {ft}) - (liquid height {ft}) + (roof outage {ft}); See reference (17).
For Horizontal Tanks: Vapor space outage (ft) = (π / 8) x (tank diameter {ft}); See reference (17).

(l) Vented vapor saturation factor = (1) / ([1] + [0.053] x [vapor pressure at average daily liquid surface temperature {psia}] x [vapor space outage {ft}]); See reference (18).

(m) Average daily ambient temperature (°R) = ([average daily maximum ambient temperature {°R}] + [average daily minimum ambient temperature {°R}]) / (2); See reference (19).

(n) If non-heated tank: Liquid bulk temperature (°R) = (average daily ambient temperature [°R]) + ([0.003] x [tank shell surface solar absorptance {°R}] x [average daily total insolation factor {Btu/ft²-day}]); See reference (20).
For heated tanks, the setpoint temperature for the storage tank is assumed to be representative of the liquid bulk temperature.

(o) Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature {°R}]) + ([0.6] x [liquid bulk temerature {°R}) + ([0.005] X [tank shell surface solar absorptance {°R}] x [average daily total insolation factor {Btu/ft²-day}]); See reference (21).

(p) Average vapor temperature (°R) = ([2.2 x [tank shell height |ft|} / {tank diameter |ft|} + 1.1] x [average daily ambient temperature {°R}] + [0.8 x [liquid bulk temperature |°R|}] + [0.021 x [tank roof surface solar absorptance} x {average daily total insolation factor |Btu/ft²-day|}] + [0.013 x {tank shell height |ft|} / {tank diameter |ft|} x {tank shell surface solar absorptance} x {average daily total insolation factor {|Btu/ft²-day|}]] / (2.2 x [tank shell height {ft}] / [tank diameter {ft}] + 1.9); See reference (22).

(q) Stock vapor density (lb/ft³) = ([vapor molecular weight {lb/lb-mole}] x [true vapor pressure {psia}]) / ([10.731 psia-ft³/lb-mole-°R] x [average vapor temperature {°R}]); See reference (23).

(r) Annual standing loss (lb/yr) = (365) x (vapor space exp. factor per day) x ([π/4] x [diameter {ft}]²) x (vapor space outage [ft]) x (vented vapor sat. factor) x (stock vapor density [lb/ft³]) x (1 - [control efficiency {%} / 100]); See reference (24).

(s) Daily standing loss (lb/day) = (annual standing loss [lb/yr]) / (365 days/yr)

(t) Net working loss throughput (ft³/yr or ft³/day) = (5.614 ft³/bbl) x (total annual or daily throughput [bbl/yr or bbl/day]); See reference (25).

(u) Annual or daily sum of the increases in liquid level (ft/yr or ft/day) = ([5.614 ft³/bbl] x [total annual or daily throughput {bbl/yr or bbl/day}]) / ([π/4] x [tank diameter {ft}]²); See reference (26).

(v) Number of turnovers per year or day = (annual or daily sum of the increases in liquid level [ft/yr or ft/day]) / ([maximum liquid height {ft}] - [minimum liquid height {ft}]); See reference (27).

(w) If N <= 36, working loss turnover factor equal to 1, or working loss turnover factor = ([180] + [number of turnovers per year or day]) / ([6] x [number of turnovers per year or day]); See reference (28).

(x) Annual working loss (lb/yr) = (net working loss throughput [ft³/yr]) x (working loss turnover factor) x (working loss product factor) x (stock vapor density [lb/ft³]) x (vent set. correction factor) x (1- [control efficiency {%} / 100]); See reference (30).

(y) Daily working loss (lb/day) = ([vapor molecular weight {lb/lbmol} x worst case vapor pressure {psia}] / [80.273] x [worst case liquid surface temperature {R}]) x (daily filling rate [gal/day]; See reference (30).

(z) Annual or daily total tank routine losses (lb/yr or lb/day) = (annual or daily standing losses [lb/yr or lb/day]) + (annual or daily working losses [lb/yr or lb/day]); See reference (31).

({) Liquid mole fraction of component (lb-mol/lb-mol) = (weight fraction of component in the liquid [lb/lb]) x (molecular weight of liquid stock [lb/lb-mol]) / (molecular weight of component [lb/lb-mol]); See reference (34).

(|) Partial pressure of component (psia) = (vapor pressure [psia]) x (liquid mole fraction [lb-mol/lb-mol]); See reference (36).

(}) Vapor weight fraction of component (lb/lb) = (vapor mole fraction of component [lb-mol/lb-mol]) x (molecular weight of component [lb/lb-mol]) / (molecular weight of vapor stock [lb/lb-mol]); See reference (38).

(aa) Emission rate of component (lb/yr or lb/day) = (vapor weight fraction of component [lb/lb]) x (annual or daily total routine losses [lb/yr or lb/day]); See reference (40).

REFERENCES:

(1) See Table 3, Storage Tank Input Assumptions and Parameters.
(2) See Table 1, Input Process Rates and Parameters. Requested PTE based on days of kiln operation.
(3) Engineering judgement based on typical bulk storage tank design for representative industries.
(4) AP-42, Chapter 7 (June 2020); see equation 1-36. For vertical tanks, value set to 1. For horizontal tanks, value set to 0.
(5) Assumes maximum liquid surface temperature of 95°F per "TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks." Converted to degrees Rankin.
(6) Liquid molecular weight obtained from the National Center for Biotechnology Information, PubChem online chemistry database. Representative of phenol-formaldehyde resin. Vapor molecular weight is assumed as as liquid.
(7) Vapor pressure of phenol resin at 25°C. Converted from mmHg to psia. Value obtained online at "https://blog.oureducation.in/phenolic-resin-properties-of-phenol-formaldehyde/".
(8) Representative of average daily minimum and maximum daily temperatures for the 30-year period between 1992 and 2021 for Forest Grove, Oregon (Station ID 352997). Data obtained from the WRCC.
(9) AP-42, Chapter 7 (June 2020); Table 7.1-7. Assumes Salem, Oregon as it's the nearest city in the table to the facility .
(10) AP-42, Chapter 7 (June 2020); see equation 1-11.
(11) AP-42, Chapter 7 (June 2020); Table 7.1-6.
(12) AP-42, Chapter 7 (June 2020); see equation 1-7.
(13) AP-42, Chapter 7 (June 2020); see equation 1-12.
(14) AP-42, Chapter 7 (June 2020); see equation 1-16. Per equation 1-16 notes, liquid height typically assumed to be at the half full level in the absence of site-specific data.
(15) AP-42, Chapter 7 (June 2020); see equation 1-18 for cone roofs (assumes standard cone roof slope of 0.0625 ft/ft), or see equation 1-20 for dome roofs (assumes modified dome roof radius equation).
(16) AP-42, Chapter 7 (June 2020); see equation 1-17 for cone roofs, or see equation 1-19 for dome roofs.
(17) AP-42, Chapter 7 (June 2020); see equation 1-16.
(18) AP-42, Chapter 7 (June 2020); see equation 1-21. Assumes true vapor pressure as the vapor pressure at average daily liquid surface temperature.
(19) AP-42, Chapter 7 (June 2020); see equation 1-30.
(20) AP-42, Chapter 7 (June 2020); see equation 1-31.
(21) AP-42, Chapter 7 (June 2020); see equation 1-28.
(22) AP-42, Chapter 7 (June 2020); see equation 1-32. Note the simplified version of this equation (e.g. equation 1-33) was not used since HS/D is not equal to 0.5, and allows for variances in αR and αS.
(23) AP-42, Chapter 7 (June 2020); see equation 1-22.
(24) AP-42, Chapter 7 (June 2020); see equation 1-4.
(25) AP-42, Chapter 7 (June 2020); see equation 1-39.
(26) AP-42, Chapter 7 (June 2020); see equation 1-37.
(27) AP-42, Chapter 7 (June 2020); see equation 1-36.
(28) AP-42, Chapter 7 (June 2020); see notes for equation 1-35.
(29) AP-42, Chapter 7 (June 2020); see notes for equation 1-35. Assumes working loss product factor is 0.75 for crude oils, or 1 for all other organic liquids.
(30) TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Equation 1.
(31) AP-42, Chapter 7 (June 2020); see equation 1-1.
(32) See Table 4, Storage Tank Solution Compositions.
(33) Molecular weights obtained from National Institute of Standards and Technology Chemistry WebBook.
(34) AP-42, Chapter 7 (June 2020); see equation 40-4.
(35) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 519 °R.
(36) AP-42, Chapter 7 (June 2020); see equation 40-3.
(37) AP-42, Chapter 7 (June 2020); see equation 40-5.
(38) AP-42, Chapter 7 (June 2020); see equation 40-6.
(39) AP-42 Chapter 7 (June 2020); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 519 °R.
(40) AP-42, Chapter 7 (June 2020); see equation 40-1.

Table 34
2019 TAC Emission Estimates Summary
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Emission Estimate

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Hogged Fuel-Fired Boiler (ESP Control)		Hogged Fuel-Fired Boiler (Scrubber Control)		Fuel Dryer		Lumber Kiln (Douglas Fir)		Lumber Kiln (Hemlock)		Lumber Kiln (True Fir)		Lumber Kiln Total(1)		Press (Stack)		Press (Fugitive)		Refiner (Rotary Valve)		Refiner (Scrubber 5)		Forming Line (Stack)		Forming Line (Fugitives)		HBWW - Whitewater Chest		HBWW - Machine Chest		HBWW - Head box		WW - Hydrosieves		SCR - Hydrosieves		WW - Surge Pond		WW - Aeration Basin		WW - Secondary Clarifier		WW - Sludge Pit Conveyor		WW - Sludge Pond		WW - Reuse Pond		WW - East Pond		Paintline - Basecoat		Paintline - Topcoat		Lumber Surface Treatment		Welding		Babbitt Pot		Chipper		Fire Pump		Backup Generator		Storage Tanks - D1		Storage Tanks - G1		Storage Tanks - D2		Storage Tanks - R1		Storage Tanks - R2		Storage Tanks - R3		Facility Total	
				Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Metals																																																																																			
Antimony and compounds	7440-36-0	Yes	32	9.8E-04	0.18	2.1E-03	0.098	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.8E-04	0.016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.8E-03	0.29
Arsenic and compounds	7440-38-2	Yes	35	6.1E-03	1.10	0.012	0.55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-05	3.3E-04	1.3E-04	1.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.018	1.65
Barium and compounds	7440-39-3	No	43	0.67	122	0.42	19.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.09	141
Beryllium and compounds	7440-41-7	Yes	52	9.1E-05	0.017	7.3E-05	3.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-04	0.020
Cadmium and compounds	7440-43-9	Yes	77	1.0E-03	0.19	3.4E-03	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-05	3.1E-04	1.2E-04	9.7E-04	--	--	--	--	--	--	--	--	--	--	--	--	4.5E-03	0.35
Chromium VI, chromate and dichromate pa	18540-29-9	Yes	119	8.7E-04	0.16	2.5E-04	0.012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4E-03	6.7E-04	--	--	--	--	1.4E-06	2.1E-05	8.2E-06	6.5E-05	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.17
Cobalt and compounds	7440-48-4	Yes	123	1.6E-03	0.29	2.1E-03	0.096	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-04	1.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-03	0.39
Aluminum and compounds	7429-90-5	No	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.092	1.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.092	1.04
Zinc oxide	1314-13-2	No	607	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-04	4.7E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-04	4.7E-03
Copper and compounds	7440-50-8	No	125	0.012	2.21	0.019	0.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-04	4.5E-04	6.8E-04	0.016	--	--	5.9E-05	8.4E-04	3.3E-04	2.7E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.033	3.13
Lead and compounds	7439-92-1	Yes	278	0.017	3.04	0.032	1.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.2E-04	1.7E-03	6.8E-04	5.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.049	4.52
Manganese and compounds	7439-96-5	Yes	281	0.31	55.9	0.26	12.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.0E-03	0.21	--	--	--	--	4.5E-05	6.4E-04	2.5E-04	2.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.57	68.4
Mercury and compounds	7439-97-6	Yes	284	2.8E-03	0.51	1.2E-03	0.054	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.9E-05	4.1E-04	1.6E-04	1.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-03	0.57
Molybdenum trioxide	1313-27-5	No	317	1.0E-02	1.81	3.3E-03	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.013	1.97
Nickel and compounds	7440-02-0	Yes	321	9.0E-03	1.63	7.7E-03	0.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	5.2E-03	6.8E-05	1.6E-03	--	--	5.6E-05	8.0E-04	3.2E-04	2.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.028	2.01
Selenium and compounds	7782-49-2	Yes	528	5.2E-03	0.95	1.8E-03	0.084	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-05	4.5E-04	1.8E-04	1.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	7.2E-03	1.03
Phosphorus and compounds	7723-14-0	Yes	392	0.99	181	0.33	15.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.32	196
Silver and compounds	7440-22-4	No	531	3.2E-03	0.57	1.0E-03	0.048	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-03	0.62
Thallium and compounds	7440-28-0	No	550	--	--	1.9E-03	0.091	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-03	0.091
Vanadium (fume or dust)	7440-62-2	No	594	1.9E-03	0.35	6.2E-04	0.029	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.38
Zinc and compounds	7440-66-6	No	606	0.18	33.6	0.24	11.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.43	45.1
Organic Compounds																																																																																				
1,2,4-Trimethylbenzene	95-63-6	No	588	--	--	--	--	6.1E-03	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.1E-03	0.017	8.8E-03	0.10	1.6E-03	0.012	--	--	--	--	--	--	0.019	0.29
1,2-Dichloropropane (Propylene dichloride)	78-87-5	Yes	173	0.054	9.81	0.018	0.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.072	10.6
1,2,4-Trichlorobenzene	120-82-1	Yes	571	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
1,3-Butadiene	106-99-0	Yes	67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.1E-03	0.045	0.018	0.14	--	--	--	--	--	--	--	--	--	--	--	--	0.021	0.19
Acetaldehyde	75-07-0	Yes	1	0.91	165	0.30	13.9	0.59	15.0	41.3	4,901	108	2,377	52.8	143	108	7,420	1.91	213	0.11	12.5	0.24	26.5	5.06	567	1.33	149	0.13	14.9	0.029	10.7	0.45	165	0.13	47.3	0.15	55.8	1.5E-03	0.53	0.28	100	0.011	4.19	1.8E-04	0.066	4.5E-07	1.7E-04	3.2E-05	0.012	1.7E-05	6.2E-03	2.3E-05	8.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.011	0.16	0.064	0.51	--	--	--	--	--	--	--	--	--	--	--	--	120	8,982
Acetone	67-64-1	No	3	1.70	309	0.56	26.0	3.20	81.6	--	--	--	--	--	--	--	--	2.26	252	0.039	4.31	0.77	86.3	0.61	68.2	0.59	65.8	0.059	6.58	0.011	4.08	0.15	55.9	0.034	12.5	--	--	3.7E-03	1.36	0.011	3.87	5.3E-05	0.019	1.0E-06	3.8E-04	3.2E-22	1.2E-19	4.1E-08	1.5E-05	7.7E-09	2.8E-06	8.6E-09	3.1E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.99	977
Acetophenone	98-86-2	Yes	5	5.9E-03	1.07	1.9E-03	0.090	2.9E-03	0.074	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	1.24
Acrolein	107-02-8	Yes	6	0.83	152	0.27	12.8	1.00	25.5	0.77	91.2	1.73	37.9	1.73	4.67	1.73	134	--	--	--	--	--	--	0.56	62.3	0.11	12.7	0.011	1.27	2.1E-22	7.8E-20	0.054	19.7	1.3E-21	4.7E-19	1.5E-21	5.6E-19	9.8E-03	3.57	1.2E-21	4.5E-19	3.5E-23	1.3E-20	4.9E-25	1.8E-22	8.1E-23	3.0E-20	2.7E-21	9.8E-19	1.0E-21	3.8E-19	1.3E-21	4.9E-19	--	--	--	--	--	--	--	--	--	--	--	--	4.9E-04	7.0E-03	2.8E-03	0.022	--	--	--	--	--	--	--	--	--	--	--	--	4.58	423
Ammonia	7664-41-7	No	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.042	0.60	0.24	1.88	--	--	--	--	--	--	--	--	--	--	--	--	0.28	2.48
Benzene	71-43-2	Yes	44	3.14	572	1.03	48.2	0.25	6.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-03	0.038	0.015	0.12	7.4E-03	0.093	0.20	3.47	5.8E-03	0.067	--	--	--	--	--	--	4.65	630
Carbon tetrachloride	56-23-5	Yes	84	0.032	5.76	0.010	0.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.042	6.25
Chlorine	7782-50-5	Yes	96	2.53	461	0.83	38.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.36	500
Chlorobenzene	108-90-7	Yes	102	0.053	9.69	0.017	0.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.071	10.5
Chloroform	67-66-3	Yes	107	0.064	11.7	0.021	0.99	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.086	12.7
Crotonaldehyde	4170-30-3	No	132	0.14	26.1	0.047	2.20	0.35	8.85	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.54	37.2
Methyl isobutyl ketone (MIBK, Hexone)	108-10-1	Yes	300	1.43	260	0.47	21.9	0.25	6.40	--	--	--	--	--	--	--	--	--	--	--	--	0.047	5.30	0.045	5.09	0.042	4.71	4.2E-03	0.47	2.9E-03	1.06	0.12	45.2	0.044	16.2	0.069	25.3	3.3E-04	0.12	0.011	3.88	6.1E-04	0.22	4.1E-06	1.5E-03	2.5E-08	9.0E-06	2.8E-07	1.0E-04	8.7E-08	3.2E-05	1.1E-07	4.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.54	396
Isopropylbenzene (Cumene)	98-82-8	Yes	275	0.057	10.3	0.019	0.87	3.5E-03	0.088	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-04	2.5E-03	6.3E-04	8.0E-03	2.1E-04	1.8E-03	--	--	--	--	--	--	0.080	11.3
Dibutyl phthalate	84-74-2	Yes	161	0.11	19.4	0.035	1.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.14	21.1
Diethylphthalate	84-66-2	No	186	0.14	25.4	0.046	2.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.19	27.6
Ethyl benzene	100-41-4	Yes	221	0.039	7.12	0.013	0.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-04	2.2E-03	8.9E-04	7.1E-03	1.5E-03	0.015	0.011	0.15	1.2E-03	0.011	--	--	--	--	--	--	0.067	7.91
Formaldehyde	50-00-0	Yes	240	3.37	613	1.10	51.6	0.31	7.89	2.02	239	2.02	44.2	7.01	18.9	7.01	303	1.97	219	0.099	11.0	0.065	7.32	0.65	72.6	0.53	59.1	0.053	5.91	0.029	10.7	0.10	37.6	0.024	8.81	8.3E-03	3.03	7.3E-05	0.027	0.11	38.5	1.5E-03	0.54	2.4E-05	8.8E-03	2.9E-08	1.1E-05	7.7E-06	2.8E-03	6.3E-06	2.3E-03	8.2E-06	3.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.025	0.35	0.14	1.12	--	--	--	--	--	--	0.18	5.96	0.19	5.96	0.19	5.96	16.2	1,469
Hexane	110-54-3	Yes	262	0.92	168	0.30	14.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-04	5.5E-03	2.2E-03	0.017	--	--	--	--	--	--	--	--	--	--	--	--	1.23	182
Isopropyl alcohol	67-63-0	No	274	14.5	2,638	4.75	222	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19.2	2,860
Methanol	67-56-1	Yes	288	2.35	427	0.77	36.0	0.094	2.40	60.3	7,157	106	2,318	220	595	220	10,070	87.0	9,674	1.69	188	0.23	25.9	0.58	64.6	3.01	338	0.30	33.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.34	48.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	317	20,908
Fluorides	FLUORIDES	No	238	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.18
1,3,5-Trimethylbenzene	108-67-8	No	589	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.8E-04	5.8E-03	4.0E-03	0.047	5.3E-04	4.2E-03	--	--	--	--	--	--	5.2E-03	0.057
1,2,3-Trimethylbenzene	526-73-8	No	587	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.5E-03	0.037	2.5E-03	0.028	3.5E-03	0.026	--	--	--	--	--	--	0.010	0.091
Cyclohexane	110-82-7	No	136	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.021	0.28	0.32	5.76	0.017	0.20	--	--	--	--	--	--	0.36	6.23
Bromomethane (Methyl bromide)	74-83-9	Yes	64	0.036	6.60	0.012	0.56	4.2E-03	0.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.052	7.26
Chloromethane (Methyl chloride)	74-87-3	Yes	108	0.14	25.4	0.046	2.14	0.017	0.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.20	28.0
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	Yes	572	0.19	33.7	0.061	2.84	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.25	36.6
Dichloromethane (Methylene chloride)	75-09-2	Yes	170	1.28	232	0.42	19.6	0.080	2.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.77	254
2-Butanone (Methyl ethyl ketone)	78-93-3	No	68	0.022	4.07	7.3E-03	0.34	0.20	5.01	--	--	--	--	--	--	--	--	--	--	--	--	0.046	5.14	0.026	2.88	0.083	9.25	8.3E-03	0.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.39	27.6
Phenol	108-95-2	Yes	383	0.51	93.4	0.17	7.87	1.84	46.9	--	--	--	--	--	--	--	--	--	--	0.070	7.83	--	--	--	--	--	--	--	--	4.5E-04	0.17	5.9E-04	0.21	2.7E-04	0.099	2.2E-04	0.079	2.1E-05	7.8E-03	8.3E-06	3.0E-03	1.9E-09	6.8E-07	3.8E-11	1.4E-08	2.6E-14	9.7E-12	1.7E-13	6.3E-11	4.4E-15	1.6E-12	5.1E-15	1.9E-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-04	1.4E-03	2.5E-04	1.4E-03	2.5E-04	1.4E-03	2.59	157
Propionaldehyde	123-38-6	Yes	510	1.00	182	0.33	15.3	0.33	8.37	0.86	103	1.15	25.3	1.15	3.11	1.15	131	--	--	--	--	--	--	0.069	7.79	--	--	--	--	1.2E-03	0.45	0.016	5.93	4.8E-03	1.74	5.6E-03	2.05	4.3E-03	1.57	9.2E-03	3.36	2.7E-04	0.099	4.7E-06	1.7E-03	9.9E-09	3.6E-06	7.3E-07	2.7E-04	3.6E-07	1.3E-04	4.8E-07	1.8E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.92	359
Styrene	100-42-5	Yes	536	1.50	274	0.49	23.1	0.011	0.28	--	--	--	--	--	--	--	--	--	--	--	--	0.033	3.74	0.033	3.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-07	1.6E-06	3.3E-05	4.4E-04	1.3E-07	1.1E-06	--	--	--	--	--	--	2.07	305
Toluene	108-88-3	Yes	555	0.037	6.65	0.012	0.56	0.41	10.4	--	--	--	--	--	--	--	--	--	--	7.7E-03	0.86	--	--	--	--	0.083	9.31	8.3E-03	0.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-03	0.022	8.6E-03	0.068	8.3E-03	0.094	0.16	2.46	6.4E-03	0.067	--	--	--	--	--	--	0.74	31.4
m-Xylene	108-38-3	Yes	603	--	--	--	--	0.12	3.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	3.15
p-Xylene	106-42-3	Yes	605	--	--	--	--	0.12	3.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.8E-03	0.048	0.031	0.43	3.7E-03	0.035	--	--	--	--	--	--	0.16	3.66
o-Xylene	95-47-6	Yes	604	--	--	--	--	2.2E-03	0.055	--	--	--	--	--	--	--	--	--	--	0.025	2.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-03	0.016	0.012	0.16	1.3E-03	0.011	--	--	--	--	--	--	0.042	3.06
Butyl benzyl phthalate	85-68-7	No	74	0.086	15.6	0.028	1.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	17.0
Ethylene glycol monobutyl ether	111-76-2	Yes	228	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.34	42.7	0.43	21.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.77	64.1
Butyl acrylate	141-32-2	No	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
Dipropylene glycol monomethyl ether	34590-94-8	No	210	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34.3	3,428	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34.3	3,428
Diethylene glycol monobutyl ether	112-34-5	Yes	183	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.66	38.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.66	38.5
Vinyl Chloride	75-01-4	Yes	598	0.059	10.7	0.019	0.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.078	11.6
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	574	0.064	11.6	0.021	0.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.085	12.6
Vinyl acetate	108-05-4	Yes	596	--	--	--	--	2.7E-03	0.068	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-03	0.068
Xylene (mixture), including m-xylene, o-xylene	1330-20-7	Yes	602	0.017	3.05	5.5E-03	0.26	--	--	--	--	--	--	--	--	--	--	--	--	0.037	4.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.1E-04	8.7E-03	3.5E-03	0.028	--	--	--	--	--	--	--	--	--	--	--	--	0.064	7.49
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Acenaphthene	83-32-9	Yes	458	2.7E-03	0.50	9.0E-04	0.042	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6E-03	0.54
Acenaphthylene	208-96-8	Yes	459	0.015	2.74	4.9E-03	0.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.020	2.97
Anthracene	120-12-7	Yes	460	8.6E-03	1.56	2.8E-03	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	1.70
Benz[a]anthracene	56-55-3	Yes	462	2.6E-04	0.047	8.5E-05	4.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.5E-04	0.051
Benzo[a]pyrene	50-32-8	Yes	463	7.1E-03	1.30	2.3E-03	0.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.1E-07	7.3E-06	2.9E-06	2.3E-05	--	--	--	--	--	--	--	--	--	--	--	--	9.5E-03	1.40
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Perylene	198-55-0	Yes	486	1.0E-04	0.019	3.4E-05	1.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4E-04	0.020
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1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxC	57653-85-7	No	443	6.7E-09	1.2E-06	2.2E-09	1.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.9E-09	1.3E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxC	19408-74-3	No	444	7.1E-09	1.3E-06	2.3E-09	1.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.4E-09	1.4E-06
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Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	No	446	7.9E-08	1.4E-05	2.6E-08	1.2E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-07	1.6E-05
2,3,7,8-Tetrachlorodibenzofuran (TcDF)	51207-31-9	No	447	2.6E-08	4.7E-06	8.5E-09	4.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-08	5.1E-06
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-41-6	No	448	1.3E-08	2.3E-06	4.2E-09	2.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.7E-08	2.5E-06
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	No	449	2.0E-08	3.6E-06	6.4E-09	3.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.6E-08	3.9E-06
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	No	450	1.1E-08	2.1E-06	3.7E-09	1.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-08	2.3E-06
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	No	451	1.0E-08	1.8E-06	3.3E-09	1.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-08	2.0E-06
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	No	452	2.1E-09	3.9E-07	7.0E-10	3.3E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-09	4.2E-07
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	No	453	8.5E-09	1.6E-06	2.8E-09	1.3E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-08	1.7E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCD	67562-39-4	No	454	1.8E-08	3.3E-06	6.0E-09	2.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-08	3.6E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCD	55673-89-7	No	455	2.6E-09	4.7E-07	8.4E-10	3.9E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-09	5.0E-07
Octachlorodibenzofuran (OCDF)	39001-02-0	No	456	1.6E-08	2.9E-06	5.3E-09	2.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.1E-08	3.2E-06
PCBs & Phthalates																																																																																				
Total PCBs	1336-36-3	Yes	409	2.4E-05	4.4E-03	8.0E-06	3.7E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-05	4.8E-03
Decachlorobiphenyl	2051-24-3	Yes	438	8.5E-07	1.5E-04	2.8E-07	1.3E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-06	1.7E-04
3-Methylcholanthrene	56-49-5	Yes	496	2.8E-05	5.1E-03	9.1E-06	4.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.7E-05	5.5E-03
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	493	1.5E-05	2.7E-03	4.8E-06	2.2E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-05	2.9E-03
1-Methylphenanthrene	832-69-9	No	307	8.3E-04	0.15	2.7E-04	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-03	0.16
2,4-Dinitrotoluene	121-14-2	Yes	204	3.0E-03	0.55	9.9E-04	0.046	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.0E-03	0.60
4,6-Dinitro-o-cresol (and salts)	534-52-1	Yes	202	6.7E-03	1.23	2.2E-03	0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.9E-03	1.33
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	59	1.5E-04	0.027	4.9E-05	2.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.0E-04	0.029
Hydrogen cyanide	74-90-8	No	135	0.066	12.0	0.022	1.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.087	13.0
di-n-octylphthalateb	117-84-0	No	518	3.5E-04	0.064	1.2E-04	5.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.7E-04	0.070
Ethylene dichloride (EDC, 1,2-dichloroethane	107-06-2	Yes	224	0.094	17.0	0.031	1.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	18.5
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	164	0.89	163	0.29	13.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.19	177
4-nitrophenol	100-02-7	Yes	350	3.7E-04	0.067	1.2E-04	5.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.9E-04	0.072
2-Chlorophenol	95-57-8	No	111	7.5E-05	0.014	2.5E-05	1.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-04	0.015
2,4-Dinitrophenol	51-28-5	Yes	203	5.8E-04	0.11	1.9E-04	8.9E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.7E-04	0.11
Trichlorofluoromethane (Freon 11)	75-69-4	No	575	0.045	8.11	0.015	0.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.059	8.80
2,4,6-Trichlorophenol	88-06-2	Yes	577	6.4E-04	0.12	2.1E-04	9.8E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.5E-04	0.13
Pentachlorophenol	87-86-5	Yes	371	6.9E-04	0.12	2.3E-04	0.011	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.1E-04	0.14
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	547	0.079	14.4	0.026	1.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	15.6
Total TAC Emissions Estimate				41.6	7,572	14.3	667	9.54	243	105	12,491	219	4,802	283	765	338	18,057	93.1	10,357	2.08	231	1.43	160	7.62	854	5.78	648	0.58	64.8	0.074	27.2	0.90	330	0.24	86.6	0.24	86.2	0.020	7.19	0.41	150	0.014	5.07	2.2E-04	0.079	5.2E-07	1.9E-04	4.1E-05	0.015	2.4E-05	8.6E-03	3.2E-05	0.012	0.34	42.7	0.43	21.4	37.0	3,467	0.11	1.44	1.4E-03	0.033	0.34	48.7	0.98	14.0	1.19	9.43	0.054	0.61	0.74	12.6	0.042	0.44	0.18	5.96	0.19	5.96	0.19	5.96	558	43,184
Total HAP Emissions Estimate				24.0	4,373	8.10	379	5.80	148	105	12,491	219	4,802	283	765	338	18,057	90.8	10,106	2.04	227	0.61	68.7	6.99	783	5.11	573	0.51	57.3	0.063	23.1	0.75	274	0.20	74.1	0.24	86.2	0.016	5.83	0.40	146	0.014	5.05	2.1E-04	0.078	5.2E-07	1.9E-04	4.1E-05	0.015	2.4E-05	8.6E-03	3.2E-05	0.012	0.34	42.7	0.43	21.4	2.66	38.5	0.016	0.22	7.4E-04	0.017	0.34	48.7	0.049	0.70	0.28	2.21	0.025	0.28	0.41	6.68	0.020	0.20	0.18	5.96	0.19	5.96	0.19	5.96	489	35,567
Single Highest HAP = Methanol																																																																																					20,908

REFERENCES:
(1) Daily emissions estimates for each species are based on maximum daily throughput capacity. Therefore, daily TAC emissions from all lumber kiln are equal to the highest daily emission rate of each pollutant across the all three species.

Table 35
PTE TAC Emission Estimates Summary
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Emission Estimate (part 1 of 3)

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Hogged Fuel-Fired Boiler (ESP Control) Daily (lb/day)	Hogged Fuel-Fired Boiler (ESP Control) Annual (lb/yr)	Hogged Fuel-Fired Boiler (Scrubber Control) Daily (lb/day)	Hogged Fuel-Fired Boiler (Scrubber Control) Annual (lb/yr)	Fuel Dryer Daily (lb/day)	Fuel Dryer Annual (lb/yr)	Lumber Kiln (Douglas Fir) Daily (lb/day)	Lumber Kiln (Douglas Fir) Annual (lb/yr)	Lumber Kiln (Hemlock) Daily (lb/day)	Lumber Kiln (Hemlock) Annual (lb/yr)	Lumber Kiln (True Fir) Daily (lb/day)	Lumber Kiln (True Fir) Annual (lb/yr)	Lumber Kiln Total[1] Daily (lb/day)	Lumber Kiln Total[1] Annual (lb/yr)	Press (Stack) Daily (lb/day)	Press (Stack) Annual (lb/yr)	Press (Fugitive) Daily (lb/day)	Press (Fugitive) Annual (lb/yr)
Metals																					
Antimony and compounds	7440-36-0	Yes	32	9.8E-04	0.28	2.1E-03	0.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic and compounds	7440-38-2	Yes	35	6.1E-03	1.74	0.012	0.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium and compounds	7440-39-3	No	43	0.67	193	0.42	22.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium and compounds	7440-41-7	Yes	52	9.1E-05	0.026	7.3E-05	3.9E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium and compounds	7440-43-9	Yes	77	1.0E-03	0.30	3.4E-03	0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium VI, chromate and dichromate pa	18540-29-9	Yes	119	8.7E-04	0.25	2.5E-04	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt and compounds	7440-48-4	Yes	123	1.6E-03	0.46	2.1E-03	0.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aluminum and compounds	7429-90-5	No	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc oxide	1314-13-2	No	607	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper and compounds	7440-50-8	No	125	0.012	3.50	0.019	1.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead and compounds	7439-92-1	Yes	278	0.017	4.80	0.032	1.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus and compounds	7723-14-0	Yes	392	0.99	286	0.33	17.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese and compounds	7439-96-5	Yes	281	0.31	88.3	0.26	14.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury and compounds	7439-97-6	Yes	284	2.8E-03	0.81	1.2E-03	0.062	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	No	317	1.0E-02	2.86	3.3E-03	0.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel and compounds	7440-02-0	Yes	321	9.0E-03	2.58	7.7E-03	0.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium and compounds	7782-49-2	Yes	528	5.2E-03	1.49	1.8E-03	0.096	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver and compounds	7440-22-4	No	531	3.2E-03	0.91	1.0E-03	0.055	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium and compounds	7440-28-0	No	550	--	--	1.9E-03	0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium (fume or dust)	7440-62-2	No	594	1.9E-03	0.55	6.2E-04	0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc and compounds	7440-66-6	No	606	0.18	53.1	0.24	13.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Organic Compounds																					
Acetaldehyde	75-07-0	Yes	1	0.91	261	0.30	15.9	0.59	53.0	41.3	6,285	108	3,435	52.8	186	108	9,906	1.91	342	0.11	20.2
Acetone	67-64-1	No	3	1.70	488	0.56	29.8	3.20	288	--	--	--	--	--	--	--	--	2.26	405	0.039	6.93
Acetophenone	98-86-2	Yes	5	5.9E-03	1.70	1.9E-03	0.10	2.9E-03	0.26	--	--	--	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	Yes	6	0.83	240	0.27	14.6	1.00	90.1	0.77	117	1.73	54.8	1.73	6.09	1.73	178	--	--	--	--
Ammonia	7664-41-7	No	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	Yes	44	3.14	904	1.03	55.1	0.25	22.4	--	--	--	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	56-23-5	Yes	84	0.032	9.10	0.010	0.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorine	7782-50-5	Yes	96	2.53	729	0.83	44.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butyl benzyl phthalate	85-68-7	No	74	0.086	24.7	0.028	1.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene glycol monobutyl ether	111-76-2	Yes	228	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butyl acrylate	141-32-2	No	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dipropylene glycol monomethyl ether	34590-94-8	No	210	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethylene glycol monobutyl ether	112-34-5	Yes	183	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl acetate	108-05-4	Yes	596	--	--	--	--	2.7E-03	0.24	--	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	108-90-7	Yes	102	0.053	15.3	0.017	0.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloroform	67-66-3	Yes	107	0.064	18.5	0.021	1.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Crotonaldehyde	4170-30-3	No	132	0.14	41.3	0.047	2.52	0.35	31.2	--	--	--	--	--	--	--	--	--	--	--	--
Dibutyl phthalate	84-74-2	Yes	161	0.11	30.7	0.035	1.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane (Propylene dichloride)	78-87-5	Yes	173	0.054	15.5	0.018	0.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethylphthalate	84-66-2	No	186	0.14	40.2	0.046	2.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	100-41-4	Yes	221	0.039	11.3	0.013	0.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	Yes	240	3.37	968	1.10	59.1	0.31	27.8	2.02	307	2.02	64.0	7.01	24.7	7.01	396	1.97	353	0.099	17.6
Methyl isobutyl ketone (MIBK, Hexone)	108-10-1	Yes	300	1.43	410	0.47	25.0	0.25	22.6	--	--	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene (Cumene)	98-82-8	Yes	275	0.057	16.3	0.019	1.00	3.5E-03	0.31	--	--	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	Yes	262	0.92	266	0.30	16.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	No	274	14.5	4,169	4.75	254	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methanol	67-56-1	Yes	288	2.35	675	0.77	41.2	0.094	8.47	60.3	9,179	106	3,350	220	777	220	13,306	87.0	15,561	1.69	302
1,3,5-Trimethylbenzene	108-67-8	No	589	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorides	FLUORIDES	No	238	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trimethylbenzene	526-73-8	No	587	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cyclohexane	110-82-7	No	136	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	74-83-9	Yes	64	0.036	10.4	0.012	0.64	4.2E-03	0.38	--	--	--	--	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	74-87-3	Yes	108	0.14	40.1	0.046	2.45	0.017	1.57	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	Yes	67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	120-82-1	Yes	571	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	Yes	572	0.19	53.3	0.061	3.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethyl benzene	95-63-6	No	588	--	--	--	--	6.1E-03	0.55	--	--	--	--	--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	75-09-2	Yes	170	1.28	367	0.42	22.4	0.080	7.24	--	--	--	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone)	78-93-3	No	68	0.022	6.43	7.3E-03	0.39	0.20	17.7	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	108-95-2	Yes	383	0.51	148	0.17	9.00	1.84	165	--	--	--	--	--	--	--	--	--	--	0.070	12.6
Propionaldehyde	123-38-6	Yes	510	1.00	287	0.33	17.5	0.33	29.5	0.86	132	1.15	36.5	1.15	4.06	1.15	172	--	--	--	--
Styrene	100-42-5	Yes	536	1.50	433	0.49	26.4	0.011	0.99	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	108-88-3	Yes	555	0.037	10.5	0.012	0.64	0.41	36.7	--	--	--	--	--	--	--	--	--	--	7.7E-03	1.39
Xylene (mixture)	1330-20-7	Yes	602	0.017	4.81	5.5E-03	0.29	--	--	--	--	--	--	--	--	--	--	--	--	0.037	6.68
Vinyl Chloride	*75-01-4*	Yes	598	0.059	17.0	0.019	1.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	*79-01-6*	Yes	574	0.064	18.4	0.021	1.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--
m-Xylene	108-38-3	Yes	603	--	--	--	--	0.12	11.1	--	--	--	--	--	--	--	--	--	--	--	--
p-Xylene	106-42-3	Yes	605	--	--	--	--	0.12	11.1	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	Yes	604	--	--	--	--	2.2E-03	0.20	--	--	--	--	--	--	--	--	--	--	0.025	4.54
Inorganic Compounds																					
Hydrogen fluoride	7664-39-3	Yes	267	0.29	83.5	0.027	1.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silica, crystalline (respirable)	7631-86-9	No	530	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrochloric acid	7647-01-0	Yes	265	0.18	52.8	0.14	7.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diesel Particulate Matter																					
DPM	DPM	No	179	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PAHs																					
PAHs (excluding Naphthalene)	PAHs	Yes	457	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	83-32-9	Yes	458	2.7E-03	0.79	9.0E-04	0.048	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	208-96-8	Yes	459	0.015	4.33	4.9E-03	0.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	120-12-7	Yes	460	8.6E-03	2.47	2.8E-03	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benz[a]anthracene	56-55-3	Yes	462	2.6E-04	0.075	8.5E-05	4.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[a]pyrene	50-32-8	Yes	463	7.1E-03	2.05	2.3E-03	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[b]fluoranthene	205-99-2	Yes	464	4.6E-04	0.13	1.5E-04	8.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[e]pyrene	192-97-2	Yes	466	6.8E-04	0.19	2.2E-04	0.012	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[g,h,i]perylene	191-24-2	Yes	467	4.8E-04	0.14	1.6E-04	8.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[j]fluoranthene	205-82-3	Yes	468	5.0E-04	0.14	1.6E-04	8.8E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[k]fluoranthene	207-08-9	Yes	469	1.7E-04	0.048	5.4E-05	2.9E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	218-01-9	Yes	471	2.5E-04	0.073	8.3E-05	4.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenz[a,h]anthracene	53-70-3	Yes	476	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	Yes	482	5.4E-03	1.54	1.8E-03	0.094	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorene	86-73-7	Yes	483	9.6E-03	2.78	3.2E-03	0.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	484	3.3E-04	0.094	1.1E-04	5.7E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methyl naphthalene	91-57-6	Yes	485	4.5E-03	1.29	1.5E-03	0.079	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	Yes	320	0.32	91.9	0.10	5.60	0.36	32.2	--	--	--	--	--	--	--	--	--	--	--	--
Perylene	198-55-0	Yes	486	1.0E-04	0.030	3.4E-05	1.8E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	Yes	487	0.021	5.96	6.8E-03	0.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	129-00-0	Yes	488	0.011	3.26	3.7E-03	0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dioxans & Furans																					
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	Yes	440	3.1E-09	8.8E-07	1.0E-09	5.4E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Biphenyl	92-52-4	Yes	55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCD	40321-76-4	No	441	4.3E-09	1.2E-06	1.4E-09	7.5E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCD	39227-28-6	No	442	2.8E-09	8.0E-07	9.1E-10	4.9E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCD	57653-85-7	No	443	6.7E-09	1.9E-06	2.2E-09	1.2E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCD	19408-74-3	No	444	7.1E-09	2.0E-06	2.3E-09	1.2E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (H	35822-46-9	No	445	3.1E-08	9.0E-06	1.0E-08	5.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	No	446	7.9E-08	2.3E-05	2.6E-08	1.4E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,7,8-Tetrachlorodibenzofuran (TcDF)	51207-31-9	No	447	2.6E-08	7.4E-06	8.5E-09	4.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-41-6	No	448	1.3E-08	3.7E-06	4.2E-09	2.2E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	No	449	2.0E-08	5.6E-06	6.4E-09	3.4E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	No	450	1.1E-08	3.3E-06	3.7E-09	2.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	No	451	1.0E-08	2.9E-06	3.3E-09	1.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	No	452	2.1E-09	6.2E-07	7.0E-10	3.8E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	No	453	8.5E-09	2.5E-06	2.8E-09	1.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCD	67562-39-4	No	454	1.8E-08	5.3E-06	6.0E-09	3.2E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCD	55673-89-7	No	455	2.6E-09	7.4E-07	8.4E-10	4.5E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Octachlorodibenzofuran (OCDF)	39001-02-0	No	456	1.6E-08	4.6E-06	5.3E-09	2.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCBs & Phthalates																					
Total PCBs	*1336-36-3*	Yes	409	2.4E-05	7.0E-03	8.0E-06	4.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Decachlorobiphenyl	*2051-24-3*	Yes	438	8.5E-07	2.4E-04	2.8E-07	1.5E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Methylcholanthrene	*56-49-5*	Yes	496	2.8E-05	8.0E-03	9.1E-06	4.9E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7,12-Dimethylbenz[a]anthracene	*57-97-6*	Yes	493	1.5E-05	4.2E-03	4.8E-06	2.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylphenanthrene	*832-69-9*	No	307	8.3E-04	0.24	2.7E-04	0.015	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	*121-14-2*	Yes	204	3.0E-03	0.87	9.9E-04	0.053	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,6-Dinitro-o-cresol (and salts)	*534-52-1*	Yes	202	6.7E-03	1.94	2.2E-03	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate (DEHP)	*117-81-7*	Yes	59	1.5E-04	0.043	4.9E-05	2.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrogen cyanide	*74-90-8*	Yes	135	0.066	18.9	0.022	1.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--
di-n-octylphthalateb	*117-84-0*	No	518	3.5E-04	0.10	1.2E-04	6.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene dichloride (EDC, 1,2-dichloroethane	*107-06-2*	Yes	224	0.094	26.9	0.031	1.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--
p-Dichlorobenzene (1,4-Dichlorobenzene)	*106-46-7*	Yes	164	0.89	257	0.29	15.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-nitrophenol	*100-02-7*	Yes	350	3.7E-04	0.11	1.2E-04	6.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Chlorophenol	*95-57-8*	No	111	7.5E-05	0.022	2.5E-05	1.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	*51-28-5*	Yes	203	5.8E-04	0.17	1.9E-04	0.010	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon 11)	*75-69-4*	No	575	0.045	12.8	0.015	0.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	*88-06-2*	Yes	577	6.4E-04	0.18	2.1E-04	0.011	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	*87-86-5*	Yes	371	6.9E-04	0.20	2.3E-04	0.012	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene (Perchloroethylene)	*127-18-4*	Yes	547	0.079	22.7	0.026	1.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total TAC Emissions Estimate				**41.6**	**11,965**	**14.3**	**763**	**9.54**	**859**	**105**	**16,019**	**219**	**6,941**	**283**	**998**	**338**	**23,958**	**93.1**	**16,661**	**2.08**	**372**
Total HAP Emissions Estimate				**24.0**	**6,910**	**8.10**	**434**	**5.80**	**522**	**105**	**16,019**	**219**	**6,941**	**283**	**998**	**338**	**23,958**	**90.8**	**16,256**	**2.04**	**365**

Emission Estimate (part 2 of 3)

Toxic Air Contaminant	Refiner (Rotary Valve) Daily (lb/day)	Refiner (Rotary Valve) Annual (lb/yr)	Refiner (Scrubber 5) Daily (lb/day)	Refiner (Scrubber 5) Annual (lb/yr)	Forming Line (Stack) Daily (lb/day)	Forming Line (Stack) Annual (lb/yr)	Forming Line (Fugitives) Daily (lb/day)	Forming Line (Fugitives) Annual (lb/yr)	HBWW - Whitewater Chest Daily (lb/day)	HBWW - Whitewater Chest Annual (lb/yr)	HBWW - Machine Chest Daily (lb/day)	HBWW - Machine Chest Annual (lb/yr)	HBWW - Head box Daily (lb/day)	HBWW - Head box Annual (lb/yr)	WW - Hydrosieves Daily (lb/day)	WW - Hydrosieves Annual (lb/yr)	SCR - Hydrosieves Daily (lb/day)	SCR - Hydrosieves Annual (lb/yr)	WW - Surge Pond Daily (lb/day)	WW - Surge Pond Annual (lb/yr)	WW - Aeration Basin Daily (lb/day)	WW - Aeration Basin Annual (lb/yr)	WW - Secondary Clarifier Daily (lb/day)	WW - Secondary Clarifier Annual (lb/yr)	WW - Sludge Pit Conveyor Daily (lb/day)	WW - Sludge Pit Conveyor Annual (lb/yr)	WW - Sludge Pond Daily (lb/day)	WW - Sludge Pond Annual (lb/yr)	WW - Reuse Pond Daily (lb/day)	WW - Reuse Pond Annual (lb/yr)	WW - East Pond Daily (lb/day)	WW - East Pond Annual (lb/yr)
Metals																																
Antimony and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium VI, chromate and dichromate pa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aluminum and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc oxide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum trioxide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium (fume or dust)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Organic Compounds																																
Acetaldehyde	0.24	46.3	5.06	992	1.33	261	0.13	26.1	0.044	16.1	0.68	248	0.19	70.9	0.31	112	2.9E-03	1.06	0.55	202	0.023	8.41	3.6E-04	0.13	9.1E-07	3.3E-04	6.5E-05	0.024	3.4E-05	0.012	4.6E-05	0.017
Acetone	0.77	151	0.61	119	0.59	115	0.059	11.5	0.017	6.12	0.23	83.8	0.051	18.7	--	--	7.5E-03	2.73	0.021	7.76	1.1E-04	0.039	2.1E-06	7.5E-04	6.4E-22	2.3E-19	8.1E-08	3.0E-05	1.5E-08	5.6E-06	1.7E-08	6.3E-06
Acetophenone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acrolein	--	--	0.56	109	0.11	22.2	0.011	2.22	3.2E-22	1.2E-19	0.081	29.6	1.9E-21	7.0E-19	3.1E-21	1.1E-18	0.020	7.16	2.5E-21	9.0E-19	7.0E-23	2.6E-20	9.9E-25	3.6E-22	1.6E-22	6.0E-20	5.4E-21	2.0E-18	2.1E-21	7.6E-19	2.7E-21	9.7E-19
Ammonia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorine	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butyl benzyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene glycol monobutyl ether	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butyl acrylate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dipropylene glycol monomethyl ether	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethylene glycol monobutyl ether	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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Chloroform	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Crotonaldehyde	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibutyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane (Propylene dichloride)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethylphthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Formaldehyde	0.065	12.8	0.65	127	0.53	103	0.053	10.3	0.044	16.1	0.15	56.5	0.036	13.2	0.017	6.08	1.5E-04	0.054	0.21	77.2	3.0E-03	1.08	4.8E-05	0.018	5.9E-08	2.1E-05	1.5E-05	5.7E-03	1.3E-05	4.6E-03	1.6E-05	6.0E-03
Methyl isobutyl ketone (MIBK, Hexone)	0.047	9.28	0.045	8.91	0.042	8.24	4.2E-03	0.82	4.3E-03	1.59	0.19	67.8	0.067	24.3	0.14	50.7	6.7E-04	0.24	0.021	7.79	1.2E-03	0.45	8.3E-06	3.0E-03	5.0E-08	1.8E-05	5.7E-07	2.1E-04	1.7E-07	6.3E-05	2.2E-07	8.1E-05
Isopropylbenzene (Cumene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropyl alcohol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methanol	0.23	45.3	0.58	113	3.01	591	0.30	59.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorides	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane (Methyl chloroform)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethyl benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone)	0.046	8.99	0.026	5.03	0.083	16.2	8.3E-03	1.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	--	--	--	--	--	--	--	--	6.8E-04	0.25	8.8E-04	0.32	4.1E-04	0.15	4.4E-04	0.16	4.3E-05	0.016	1.7E-05	6.1E-03	3.7E-09	1.4E-06	7.6E-11	2.8E-08	5.3E-14	1.9E-11	3.5E-13	1.3E-10	8.8E-15	3.2E-12	1.0E-14	3.7E-12
Propionaldehyde	--	--	0.069	13.6	--	--	--	--	1.8E-03	0.67	0.024	8.90	7.2E-03	2.61	0.011	4.12	8.6E-03	3.15	0.018	6.74	5.4E-04	0.20	9.4E-06	3.4E-03	2.0E-08	7.2E-06	1.5E-06	5.4E-04	7.2E-07	2.6E-04	9.7E-07	3.5E-04
Styrene	0.033	6.55	0.033	6.55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	0.083	16.3	8.3E-03	1.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene (mixture)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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Acenaphthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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Benzo[g,h,i]perylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[j]fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[k]fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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Dibenz[a,h]anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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Indeno[1,2,3-cd]pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methyl naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Perylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dioxans & Furans																																
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Biphenyl	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Octachlorodibenzofuran (OCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCBs & Phthalates																																
Total PCBs	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Decachlorobiphenyl	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Methylcholanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7,12-Dimethylbenz[a]anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,6-Dinitro-o-cresol (and salts)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate (DEHP)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrogen cyanide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
di-n-octylphthalateb	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene dichloride (EDC, 1,2-dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
p-Dichlorobenzene (1,4-Dichlorobenzene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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2-Chlorophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon 11)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene (Perchloroethylene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total TAC Emissions Estimate	**1.43**	**280**	**7.62**	**1,495**	**5.78**	**1,134**	**0.58**	**113**	**0.11**	**40.7**	**1.36**	**495**	**0.36**	**130**	**0.47**	**173**	**0.040**	**14.4**	**0.82**	**301**	**0.028**	**10.2**	**4.3E-04**	**0.16**	**1.0E-06**	**3.8E-04**	**8.2E-05**	**0.030**	**4.8E-05**	**0.017**	**6.4E-05**	**0.023**
Total HAP Emissions Estimate	**0.61**	**120**	**6.99**	**1,371**	**5.11**	**1,002**	**0.51**	**100**	**0.095**	**34.6**	**1.13**	**411**	**0.30**	**111**	**0.47**	**173**	**0.032**	**11.7**	**0.80**	**293**	**0.028**	**10.1**	**4.3E-04**	**0.16**	**1.0E-06**	**3.8E-04**	**8.2E-05**	**0.030**	**4.8E-05**	**0.017**	**6.4E-05**	**0.023**

Emission Estimate (part 3 of 3)

Toxic Air Contaminant	Paintline - Basecoat Daily (lb/day)	Paintline - Basecoat Annual (lb/yr)	Paintline - Topcoat Daily (lb/day)	Paintline - Topcoat Annual (lb/yr)	Lumber Surface Treatment Daily (lb/day)	Lumber Surface Treatment Annual (lb/yr)	Welding Daily (lb/day)	Welding Annual (lb/yr)	Babbitt Pot Daily (lb/day)	Babbitt Pot Annual (lb/yr)	Chipper Daily (lb/day)	Chipper Annual (lb/yr)	Fire Pump Daily (lb/day)	Fire Pump Annual (lb/yr)	Backup Generator Daily (lb/day)	Backup Generator Annual (lb/yr)	Storage Tanks - D1 Daily (lb/day)	Storage Tanks - D1 Annual (lb/yr)	Storage Tanks - G1 Daily (lb/day)	Storage Tanks - G1 Annual (lb/yr)	Storage Tanks - D2 Daily (lb/day)	Storage Tanks - D2 Annual (lb/yr)	Storage Tanks - R1 Daily (lb/day)	Storage Tanks - R1 Annual (lb/yr)	Storage Tanks - R2 Daily (lb/day)	Storage Tanks - R2 Annual (lb/yr)	Storage Tanks - R3 Daily (lb/day)	Storage Tanks - R3 Annual (lb/yr)	Facility Total Daily (lb/day)	Facility Total Annual (lb/yr)
Metals																														
Antimony and compounds	--	--	--	--	--	--	--	--	6.8E-04	0.023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.8E-03	0.42
Arsenic and compounds	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-05	1.2E-03	1.3E-04	6.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.018	2.38
Barium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.09	215
Beryllium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-04	0.030
Cadmium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-05	1.1E-03	1.2E-04	6.1E-03	--	--	--	--	--	--	--	--	--	--	--	--	4.5E-03	0.49
Chromium VI, chromate and dichromate pa	--	--	--	--	--	--	1.4E-03	2.1E-03	--	--	--	--	1.4E-06	7.2E-05	8.2E-06	4.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.27
Cobalt and compounds	--	--	--	--	--	--	2.5E-04	2.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-03	0.57
Aluminum and compounds	--	--	--	--	--	--	0.092	1.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.092	1.52
Zinc oxide	--	--	--	--	--	--	2.5E-04	7.1E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-04	7.1E-03
Copper and compounds	--	--	--	--	--	--	2.5E-04	1.6E-03	6.8E-04	0.023	--	--	5.9E-05	3.0E-03	3.3E-04	0.017	--	--	--	--	--	--	--	--	--	--	--	--	0.033	4.56
Lead and compounds	--	--	--	--	--	--	--	--	--	--	--	--	1.2E-04	6.0E-03	6.8E-04	0.034	--	--	--	--	--	--	--	--	--	--	--	--	0.049	6.53
Phosphorus and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.32	303
Manganese and compounds	--	--	--	--	--	--	3.0E-03	0.29	--	--	--	--	4.5E-05	2.2E-03	2.5E-04	0.013	--	--	--	--	--	--	--	--	--	--	--	--	0.57	103
Mercury and compounds	--	--	--	--	--	--	--	--	--	--	--	--	2.9E-05	1.4E-03	1.6E-04	8.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-03	0.88
Molybdenum trioxide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.013	3.04
Nickel and compounds	--	--	--	--	--	--	0.011	0.013	6.8E-05	2.3E-03	--	--	5.6E-05	2.8E-03	3.2E-04	0.016	--	--	--	--	--	--	--	--	--	--	--	--	0.028	3.03
Selenium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-05	1.6E-03	1.8E-04	9.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	7.2E-03	1.60
Silver and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-03	0.96
Thallium and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-03	0.10
Vanadium (fume or dust)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.58
Zinc and compounds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.43	66.2
Organic Compounds																														
Acetaldehyde	--	--	--	--	--	--	--	--	--	--	--	--	0.011	0.56	0.064	3.20	--	--	--	--	--	--	--	--	--	--	--	--	121	12,587
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.1	1,733
Acetophenone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	2.06
Acrolein	--	--	--	--	--	--	--	--	--	--	--	--	4.9E-04	0.024	2.8E-03	0.14	--	--	--	--	--	--	--	--	--	--	--	--	4.62	693
Ammonia	--	--	--	--	--	--	--	--	--	--	--	--	0.042	2.09	0.24	11.8	--	--	--	--	--	--	--	--	--	--	--	--	0.28	13.9
Benzene	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-03	0.13	0.015	0.76	7.4E-03	0.10	0.20	3.60	5.8E-03	0.080	--	--	--	--	--	--	4.65	986
Carbon tetrachloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.042	9.66
Chlorine	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.36	773
Butyl benzyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	26.2
Ethylene glycol monobutyl ether	0.34	66.0	0.43	33.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.77	99.4
Butyl acrylate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
Dipropylene glycol monomethyl ether	--	--	--	--	34.2	6,517	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34.2	6,517
Diethylene glycol monobutyl ether	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
Vinyl acetate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-03	0.24
Chlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.071	16.2
Chloroform	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.086	19.7
Crotonaldehyde	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.54	75.1
Dibutyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.14	32.6
1,2-Dichloropropane (Propylene dichloride)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.072	16.4
Diethylphthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.19	42.7
Ethyl benzene	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-04	7.9E-03	8.9E-04	0.045	1.5E-03	0.017	0.011	0.16	1.2E-03	0.013	--	--	--	--	--	--	0.067	12.2
Formaldehyde	--	--	--	--	--	--	--	--	--	--	--	--	0.025	1.24	0.14	7.05	--	--	--	--	--	--	0.18	7.99	0.19	7.99	0.19	7.99	16.3	2,277
Methyl isobutyl ketone (MIBK, Hexone)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.70	638
Isopropylbenzene (Cumene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-04	2.8E-03	6.3E-04	8.3E-03	2.1E-04	2.1E-03	--	--	--	--	--	--	0.080	17.6
Hexane	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-04	0.019	2.2E-03	0.11	--	--	--	--	--	--	--	--	--	--	--	--	1.23	282
Isopropyl alcohol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19.2	4,423
Methanol	--	--	--	--	--	--	--	--	--	--	0.34	63.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	317	30,766
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.8E-04	6.5E-03	4.0E-03	0.049	5.3E-04	5.0E-03	--	--	--	--	--	--	5.2E-03	0.061
Fluorides	--	--	--	--	--	--	2.5E-03	0.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.24
1,2,3-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.5E-03	0.041	2.5E-03	0.029	3.5E-03	0.031	--	--	--	--	--	--	0.010	0.10
Cyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.021	0.31	0.32	5.97	0.017	0.24	--	--	--	--	--	--	0.36	6.52
Bromomethane (Methyl bromide)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.052	11.4
Chloromethane (Methyl chloride)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.20	44.1
1,3-Butadiene	--	--	--	--	--	--	--	--	--	--	--	--	3.1E-03	0.16	0.018	0.89	--	--	--	--	--	--	--	--	--	--	--	--	0.021	1.04
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
1,1,1-Trichloroethane (Methyl chloroform)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.25	56.6
1,2,4-Trimethyl benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.1E-03	0.019	8.8E-03	0.11	1.6E-03	0.015	--	--	--	--	--	--	0.019	0.69
Dichloromethane (Methylene chloride)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.77	397
2-Butanone (Methyl ethyl ketone)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.39	56.3
Phenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-04	1.8E-03	2.5E-04	1.8E-03	2.5E-04	1.8E-03	2.59	335
Propionaldehyde	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.95	546
Styrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-07	1.7E-06	3.3E-05	4.6E-04	1.3E-07	1.3E-06	--	--	--	--	--	--	2.07	473
Toluene	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-03	0.076	8.6E-03	0.43	8.3E-03	0.10	0.16	2.55	6.4E-03	0.080	--	--	--	--	--	--	0.74	70.4
Xylene (mixture)	--	--	--	--	--	--	--	--	--	--	--	--	6.1E-04	0.031	3.5E-03	0.17	--	--	--	--	--	--	--	--	--	--	--	--	0.064	12.0
Vinyl Chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.078	18.0
Trichloroethene (TCE, Trichloroethylene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.085	19.5
m-Xylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	11.1
p-Xylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.8E-03	0.054	0.031	0.44	3.7E-03	0.041	--	--	--	--	--	--	0.16	11.7
o-Xylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-03	0.017	0.012	0.16	1.3E-03	0.013	--	--	--	--	--	--	0.042	4.93
Inorganic Compounds																														
Hydrogen fluoride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.32	84.9
Silica, crystalline (respirable)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
Hydrochloric acid	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-03	0.13	0.015	0.76	--	--	--	--	--	--	--	--	--	--	--	--	0.34	61.3
Diesel Particulate Matter																														
DPM	--	--	--	--	--	--	--	--	--	--	--	--	0.89	44.6	0.67	33.6	--	--	--	--	--	--	--	--	--	--	--	--	1.56	78.2
PAHs																														
PAHs (excluding Naphthalene)	--	--	--	--	--	--	--	--	--	--	--	--	5.2E-04	0.026	3.0E-03	0.15	--	--	--	--	--	--	--	--	--	--	--	--	3.5E-03	0.17
Acenaphthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6E-03	0.83
Acenaphthylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.020	4.59
Anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	2.62
Benz[a]anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.5E-04	0.080
Benzo[a]pyrene	--	--	--	--	--	--	--	--	--	--	--	--	5.1E-07	2.6E-05	2.9E-06	1.4E-04	--	--	--	--	--	--	--	--	--	--	--	--	9.5E-03	2.17
Benzo[b]fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.0E-04	0.14
Benzo[e]pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.0E-04	0.21
Benzo[g,h,i]perylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.4E-04	0.15
Benzo[j]fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.6E-04	0.15
Benzo[k]fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-04	0.051
Chrysene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-04	0.077
Dibenz[a,h]anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
Fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.1E-03	1.63
Fluorene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.013	2.95
Indeno[1,2,3-cd]pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.3E-04	0.100
2-Methyl naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.0E-03	1.37
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-04	0.014	1.6E-03	0.080	1.2E-03	9.4E-03	2.6E-04	2.6E-03	9.2E-04	7.2E-03	--	--	--	--	--	--	0.79	130
Perylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4E-04	0.031
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.027	6.32
Pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.015	3.46
Dioxans & Furans																														
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.1E-09	9.3E-07
Biphenyl	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.7E-09	1.3E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.7E-09	8.5E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.9E-09	2.0E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.4E-09	2.2E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-08	9.6E-06
Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-07	2.4E-05
2,3,7,8-Tetrachlorodibenzofuran (TcDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-08	7.9E-06
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.7E-08	3.9E-06
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.6E-08	6.0E-06
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-08	3.5E-06
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-08	3.1E-06
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-09	6.5E-07
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-08	2.6E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-08	5.6E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-09	7.8E-07
Octachlorodibenzofuran (OCDF)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.1E-08	4.9E-06
PCBs & Phthalates																														
Total PCBs	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-05	7.4E-03
Decachlorobiphenyl	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-06	2.6E-04
3-Methylcholanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.7E-05	8.5E-03
7,12-Dimethylbenz[a]anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-05	4.5E-03
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-03	0.25
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.0E-03	0.92
4,6-Dinitro-o-cresol (and salts)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.9E-03	2.05
Bis(2-ethylhexyl) phthalate (DEHP)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.0E-04	0.046
Hydrogen cyanide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.087	20.1
di-n-octylphthalateb	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.7E-04	0.11
Ethylene dichloride (EDC, 1,2-dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	28.6
p-Dichlorobenzene (1,4-Dichlorobenzene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.19	273
4-nitrophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.9E-04	0.11
2-Chlorophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-04	0.023
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.7E-04	0.18
Trichlorofluoromethane (Freon 11)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.059	13.6
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.5E-04	0.20
Pentachlorophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.1E-04	0.21
Tetrachloroethene (Perchloroethylene)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	24.1
Total TAC Emissions Estimate	**0.34**	**66.0**	**0.43**	**33.4**	**34.2**	**6,517**	**0.11**	**2.06**	**1.4E-03**	**0.047**	**0.34**	**63.7**	**0.98**	**49.2**	**1.19**	**59.3**	**0.054**	**0.69**	**0.74**	**13.1**	**0.042**	**0.53**	**0.18**	**7.99**	**0.19**	**7.99**	**0.19**	**7.99**	**557**	**65,594**
Total HAP Emissions Estimate	**0.34**	**66.0**	**0.43**	**33.4**	**0**	**0**	**0.016**	**0.30**	**7.4E-04**	**0.025**	**0.34**	**63.7**	**0.049**	**2.45**	**0.28**	**13.9**	**0.025**	**0.31**	**0.41**	**6.92**	**0.020**	**0.24**	**0.18**	**7.99**	**0.19**	**7.99**	**0.19**	**7.99**	**488**	**52,295**
Single Highest HAP = Methanol																														**30,766**

REFERENCES:
(1) Daily emissions estimates for each species are based on maximum daily throughput capacity. Therefore, daily TAC emissions from all lumber kiln are equal to the highest daily emission rate of each pollutant across the all three species.

MAUL FOSTER ALONGI