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Collins Pine, Lakeview Oregon

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Table 1
Input Process Rates and Parameters
Collins Pine, Lakeview Oregon

Source	Maximum Hourly Parameter	Maximum Daily Parameter	Annual Parameter		
			2018	PTE	
Facility Operation	--	24 (hrs/day) ⁽¹⁾	8,760 (hrs/yr) ⁽¹⁾	8,760	(hrs/yr) ⁽¹⁾
Boilers					
Total Boiler Heat Input	57.3 (MMBtu/hr) ⁽²⁾	1,375 (MMBtu/day) ⁽²⁾	357,681 (MMBtu/yr) ⁽²⁾	419,094	(MMBtu/yr) ⁽²⁾
Boiler 1 Steam Production Rate	24,000 (lb steam/hr) ⁽³⁾	576,000 (lb steam/day) ⁽³⁾	140,239,896 (lb steam/yr) ⁽³⁾	175,500,000	(lb steam/yr) ⁽³⁾
Boiler 1 Heat Input	28.7 (MMBtu/hr) ^(b)	688 (MMBtu/day) ^(c)	167,446 (MMBtu/yr) ^(b)	209,547	(MMBtu/yr) ^(b)
Boiler 2 Steam Production Rate	24,000 (lb steam/hr) ⁽³⁾	576,000 (lb steam/day) ⁽³⁾	159,325,200 (lb steam/yr) ⁽³⁾	175,500,000	(lb steam/yr) ⁽³⁾
Boiler 2 Heat Input	28.7 (MMBtu/hr) ^(b)	688 (MMBtu/day) ^(c)	190,234 (MMBtu/yr) ^(b)	209,547	(MMBtu/yr) ^(b)
Kilns					
Total Kiln Throughput	--	190 (Mbdft/day) ⁽³⁾	59,309 (Mbdft/yr) ⁽³⁾	87,900	(Mbdft/yr) ⁽³⁾
Kiln 1 Throughput	--	49.7 (Mbdft/day) ^(d)	15,518 (Mbdft/yr) ^(e)	22,999	(Mbdft/yr) ^(e)
Kiln 2 Throughput	--	49.7 (Mbdft/day) ^(d)	15,518 (Mbdft/yr) ^(e)	22,999	(Mbdft/yr) ^(e)
Kiln 3 Throughput	--	59.1 (Mbdft/day) ^(d)	18,462 (Mbdft/yr) ^(e)	27,361	(Mbdft/yr) ^(e)
Kiln 4 Throughput	--	31.4 (Mbdft/day) ^(d)	9,811 (Mbdft/yr) ^(e)	14,540	(Mbdft/yr) ^(e)
Number of days per charge	--	3.50 (days/charge) ⁽³⁾	--	--	--
Material Balance					
Tree Marking Paint Usage	--	0.096 (gal/day) ^(f)	30.0 (gal/yr) ^(g)	36.0	(gal/yr) ⁽⁶⁾
Inline Ink Usage	--	3.46 (gal/day) ^(f)	1,080 (gal/yr) ⁽³⁾	1,296	(gal/yr) ⁽⁶⁾

Notes:

- (a) Maximum daily steam production (lb steam/day) = (maximum hourly steam production [lb steam/hr]) x (facility daily hours of operation [hrs/day])
- (b) Boiler heat input (MMBtu/unit) = (boiler steam production [lb steam/unit]) x (1,194 Btu/lb steam) / (10⁶ Btu/MMBtu) (4)
- (c) Maximum daily boiler heat input (MMBtu/day) = (maximum hourly boiler heat input [MMBtu/hr]) x (facility daily hours of operation [hrs/day])
- (d) Daily kiln throughput (Mbdft/day) = (maximum kiln throughput per charge [bdft/charge]) / (1,000 bdft/Mbdft) / (number of days per charge [days/charge])
 - Maximum kiln 1 throughput per charge (bdft/charge) = 174,000 (3)
 - Maximum kiln 2 throughput per charge (bdft/charge) = 174,000 (3)
 - Maximum kiln 3 throughput per charge (bdft/charge) = 207,000 (3)
 - Maximum kiln 4 throughput per charge (bdft/charge) = 110,000 (3)
- (e) Annual kiln throughput (Mbdft/yr) = (maximum daily kiln throughput [Mbdft/day]) / (total maximum daily kiln throughput [Mbdft/day]) x (total annual kiln throughput [Mbdft/yr])
- (f) Maximum daily usage (gal/day) = (total maximum daily kiln throughput [Mbdft/day]) / (total 2018 kiln throughput [Mbdft/yr]) x (2018 usage [gal/yr])
- (g) Annual tree marking paint usage (gal/yr) = (annual tree marking paint usage [cans/yr]) x (1.6 oz/can) x (gal/128 oz)
 - Annual tree marking paint usage (cans/yr) = 240 (3)

References:

- (1) Assumes continuous operation.
- (2) Sum of Boiler 1 and Boiler 2.
- (3) Information provided by Client.
- (4) Enthalpy of steam provided by the Oregon Department of Environmental Quality.
- (5) Sum of kilns 1-4.
- (6) Assumes a 20% increase from 2018 usage.

Table 2
Boiler 1 (Wood-Fired Combustion) TAC Emission Estimates
Collins Pine, Lakeview Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor ⁽¹⁾ (lb/MMBtu)	2018 Emission Estimates		PTE Emission Estimates	
					Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Metals								
Antimony	7440-36-0	Yes	32	3.1E-06	2.1E-03	0.52	2.1E-03	0.65
Arsenic	7440-38-2	Yes	35	7.2E-06	5.0E-03	1.21	5.0E-03	1.51
Barium	7440-39-3	No	43	4.8E-03	3.32	809	3.32	1,012
Beryllium	7440-41-7	Yes	52	1.3E-07	9.2E-05	0.022	9.2E-05	0.028
Cadmium	7440-43-9	Yes	77	5.0E-06	3.4E-03	0.84	3.4E-03	1.05
Chromium VI	18540-29-9	Yes	119	7.0E-06	4.8E-03	1.17	4.8E-03	1.46
Cobalt	7440-48-4	Yes	123	1.7E-06	1.1E-03	0.28	1.1E-03	0.35
Copper and compounds	7440-50-8	No	125	1.1E-04	0.076	18.6	0.076	23.3
Lead	7439-92-1	Yes	278	3.1E-05	0.021	5.21	0.021	6.52
Manganese	7439-96-5	Yes	281	2.8E-03	1.90	462	1.90	578
Mercury	7439-97-6	Yes	284	1.8E-06	1.2E-03	0.30	1.2E-03	0.37
Molybdenum trioxide	1313-27-5	No	317	3.1E-06	2.2E-03	0.53	2.2E-03	0.66
Nickel	7440-02-0	Yes	321	1.3E-05	9.1E-03	2.21	9.1E-03	2.77
Selenium	7782-49-2	Yes	528	3.3E-06	2.2E-03	0.54	2.2E-03	0.68
Silver	7440-22-4	No	531	9.4E-04	0.64	157	0.64	196
Vanadium (fume or dust)	7440-62-2	No	594	5.9E-07	4.1E-04	0.099	4.1E-04	0.12
Zinc	7440-66-6	No	606	1.3E-03	0.89	216	0.89	270
Organic Compounds								
1,2-Dichloropropane	78-87-5	Yes	173	1.7E-05	0.012	2.81	0.012	3.52
Acetaldehyde	75-07-0	Yes	1	2.8E-04	0.19	47.4	0.19	59.3
Acetophenone	98-86-2	Yes	5	1.8E-06	1.3E-03	0.31	1.3E-03	0.39
Acrolein	107-02-8	Yes	6	2.6E-04	0.18	43.5	0.18	54.5
Benzene	71-43-2	Yes	44	9.8E-04	0.67	164	0.67	205
Carbon tetrachloride	56-23-5	Yes	84	2.0E-05	0.014	3.37	0.014	4.21
Chlorine	7782-50-5	Yes	96	1.2E-03	0.84	204	0.84	256
Chlorobenzene	108-90-7	Yes	102	1.7E-05	0.011	2.78	0.011	3.48
Chloroform	67-66-3	Yes	107	2.0E-05	0.014	3.37	0.014	4.21
Crotonaldehyde	4170-30-3	No	132	4.5E-05	0.031	7.52	0.031	9.41
Dibutyl phthalate	84-74-2	Yes	161	3.3E-05	0.023	5.58	0.023	6.98
Diethylphthalate	84-66-2	No	186	2.2E-05	0.015	3.65	0.015	4.57
Ethyl benzene	100-41-4	Yes	221	4.0E-04	0.27	66.1	0.27	82.8
Formaldehyde	50-00-0	Yes	240	1.0E-03	0.70	171	0.70	214
Hexane	110-54-3	Yes	262	2.9E-04	0.20	48.2	0.20	60.3
Isopropyl alcohol	67-63-0	No	274	3.6E-03	2.50	610	2.50	763
Methanol	67-56-1	Yes	288	7.3E-04	0.50	123	0.50	153
Methyl bromide	74-83-9	Yes	64	1.1E-05	7.8E-03	1.91	7.8E-03	2.39
Methyl chloride	74-87-3	Yes	108	3.8E-05	0.026	6.33	0.026	7.92
Methyl chloroform	71-55-6	Yes	572	5.8E-05	0.040	9.68	0.040	12.1
Methylene chloride	75-09-2	Yes	170	5.5E-04	0.38	91.6	0.38	115
Methyl ethyl ketone	78-93-3	No	68	1.6E-05	0.011	2.61	0.011	3.27
Phenol	108-95-2	Yes	383	1.6E-04	0.11	26.8	0.11	33.5
Phosphorus	7723-14-0	Yes	392	5.5E-03	3.75	913	3.75	1,142
Propionaldehyde	123-38-6	Yes	510	2.5E-04	0.17	42.2	0.17	52.8
Styrene	100-42-5	Yes	536	4.8E-04	0.33	79.9	0.33	100.0
Toluene	108-88-3	Yes	555	2.1E-05	0.015	3.53	0.015	4.42
m-Xylene	108-38-3	Yes	603	3.5E-06	2.4E-03	0.59	2.4E-03	0.74
p-Xylene	106-42-3	Yes	605	3.5E-06	2.4E-03	0.59	2.4E-03	0.74
o-Xylene	95-47-6	Yes	604	1.1E-05	7.8E-03	1.89	7.8E-03	2.37
Inorganic Compounds								
Hydrogen fluoride	7664-39-3	Yes	267	2.4E-04	0.16	39.3	0.16	49.2
Hydrochloric acid	7647-01-0	Yes	265	4.4E-03	3.00	730	3.00	914
PAHs								
Acenaphthene	83-32-9	Yes	458	8.5E-07	5.9E-04	0.14	5.9E-04	0.18
Acenaphthylene	208-96-8	Yes	459	4.7E-06	3.2E-03	0.79	3.2E-03	0.98
Anthracene	120-12-7	Yes	460	2.7E-06	1.8E-03	0.45	1.8E-03	0.56
Benz[a]anthracene	56-55-3	Yes	462	8.1E-08	5.6E-05	0.014	5.6E-05	0.017
Benzo[a]pyrene	50-32-8	Yes	463	2.7E-06	1.9E-03	0.46	1.9E-03	0.57
Benzo[b]fluoranthene	205-99-2	Yes	464	1.4E-07	9.8E-05	0.024	9.8E-05	0.030
Benzo[e]pyrene	192-97-2	Yes	466	2.1E-07	1.5E-04	0.035	1.5E-04	0.044
Benzo[g,h,i]perylene	191-24-2	Yes	467	1.5E-07	1.0E-04	0.025	1.0E-04	0.032
Benzo[j]fluoranthene	205-82-3	Yes	468	1.6E-07	1.1E-04	0.026	1.1E-04	0.033
Benzo[k]fluoranthene	207-08-9	Yes	469	5.2E-08	3.6E-05	8.7E-03	3.6E-05	0.011
Chrysene	218-01-9	Yes	471	7.9E-08	5.4E-05	0.013	5.4E-05	0.017
Dibenzo[a,h]anthracene	53-70-3	Yes	476	9.6E-09	6.6E-06	1.6E-03	6.6E-06	2.0E-03
Fluoranthene	206-44-0	Yes	482	1.7E-06	1.1E-03	0.28	1.1E-03	0.35
Fluorene	86-73-7	Yes	483	3.0E-06	2.1E-03	0.50	2.1E-03	0.63
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	484	1.0E-07	7.0E-05	0.017	7.0E-05	0.021
2-Methyl naphthalene	91-57-6	Yes	485	1.4E-06	9.6E-04	0.23	9.6E-04	0.29
Naphthalene	91-20-3	Yes	320	1.0E-04	0.068	16.7	0.068	20.9
Perylene	198-55-0	Yes	486	3.2E-08	2.2E-05	5.4E-03	2.2E-05	6.7E-03
Phenanthrene	85-01-8	Yes	487	6.5E-06	4.4E-03	1.08	4.4E-03	1.35
Pyrene	129-00-0	Yes	488	3.5E-06	2.4E-03	0.59	2.4E-03	0.74
Dioxans & Furans								
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	440	6.3E-13	4.4E-10	1.1E-07	4.4E-10	1.3E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	441	1.4E-12	9.5E-10	2.3E-07	9.5E-10	2.9E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	442	9.2E-13	6.3E-10	1.5E-07	6.3E-10	1.9E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	443	2.2E-12	1.5E-09	3.7E-07	1.5E-09	4.6E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	444	2.3E-12	1.6E-09	3.8E-07	1.6E-09	4.8E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	445	9.9E-12	6.8E-09	1.7E-06	6.8E-09	2.1E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	446	2.5E-11	1.7E-08	4.2E-06	1.7E-08	5.2E-06
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	447	8.3E-12	5.7E-09	1.4E-06	5.7E-09	1.7E-06
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	448	4.1E-12	2.8E-09	6.8E-07	2.8E-09	8.6E-07
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	449	5.7E-12	3.9E-09	9.5E-07	3.9E-09	1.2E-06
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	450	3.6E-12	2.5E-09	6.1E-07	2.5E-09	7.6E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	451	3.2E-12	2.2E-09	5.3E-07	2.2E-09	6.6E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	452	6.6E-13	4.6E-10	1.1E-07	4.6E-10	1.4E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	453	2.7E-12	1.9E-09	4.5E-07	1.9E-09	5.6E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	454	5.8E-12	4.0E-09	9.7E-07	4.0E-09	1.2E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	455	9.3E-13	6.4E-10	1.6E-07	6.4E-10	2.0E-07
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	456	5.2E-12	3.5E-09	8.6E-07	3.5E-09	1.1E-06
Total TAC Emissions Estimate					21.2	5,152	21.2	6,448
Total HAP Emissions Estimate					13.7	3,328	13.7	4,165

Notes:
(a) Maximum daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (maximum daily heat input [MMBtu/day])
Maximum daily heat input (MMBtu/day) = 688 (2)
(b) Annual emissions estimate (lb/yr) = (emission factor [lb/MMBtu]) x (annual heat input [MMBtu/yr])
2018 annual heat input (MMBtu/yr) = 167,446 (2)
PTE annual heat input (MMBtu/yr) = 209,547 (2)

References:
(1) Provided by the Oregon Department of Environmental Quality. Assumes wood-fired boiler, mechanical control.
(2) See Table 1, Input Process Rates and Parameters.

**Table 3
Boiler 2 (Wood-Fired Combustion) TAC Emission Estimates
Collins Pine, Lakeview Oregon**

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor ⁽¹⁾ (lb/MMBtu)	2018 Emission Estimates		PTE Emission Estimates	
					Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Metals								
Antimony	7440-36-0	Yes	32	3.1E-06	2.1E-03	0.59	2.1E-03	0.65
Arsenic	7440-38-2	Yes	35	7.2E-06	5.0E-03	1.37	5.0E-03	1.51
Barium	7440-39-3	No	43	4.8E-03	3.32	919	3.32	1,012
Beryllium	7440-41-7	Yes	52	1.3E-07	9.2E-05	0.025	9.2E-05	0.028
Cadmium	7440-43-9	Yes	77	5.0E-06	3.4E-03	0.95	3.4E-03	1.05
Chromium VI	18540-29-9	Yes	119	7.0E-06	4.8E-03	1.33	4.8E-03	1.46
Cobalt	7440-48-4	Yes	123	1.7E-06	1.1E-03	0.32	1.1E-03	0.35
Copper and compounds	7440-50-8	No	125	1.1E-04	0.076	21.1	0.076	23.3
Lead	7439-92-1	Yes	278	3.1E-05	0.021	5.92	0.021	6.52
Manganese	7439-96-5	Yes	281	2.8E-03	1.90	525	1.90	578
Mercury	7439-97-6	Yes	284	1.8E-06	1.2E-03	0.34	1.2E-03	0.37
Molybdenum trioxide	1313-27-5	No	317	3.1E-06	2.2E-03	0.60	2.2E-03	0.66
Nickel	7440-02-0	Yes	321	1.3E-05	9.1E-03	2.51	9.1E-03	2.77
Selenium	7782-49-2	Yes	528	3.3E-06	2.2E-03	0.62	2.2E-03	0.68
Silver	7440-22-4	No	531	9.4E-04	0.64	178	0.64	196
Vanadium (fume or dust)	7440-62-2	No	594	5.9E-07	4.1E-04	0.11	4.1E-04	0.12
Zinc	7440-66-6	No	606	1.3E-03	0.89	245	0.89	270
Organic Compounds								
1,2-Dichloropropane	78-87-5	Yes	173	1.7E-05	0.012	3.20	0.012	3.52
Acetaldehyde	75-07-0	Yes	1	2.8E-04	0.19	53.8	0.19	59.3
Acetophenone	98-86-2	Yes	5	1.8E-06	1.3E-03	0.35	1.3E-03	0.39
Acrolein	107-02-8	Yes	6	2.6E-04	0.18	49.5	0.18	54.5
Benzene	71-43-2	Yes	44	9.8E-04	0.67	186	0.67	205
Carbon tetrachloride	56-23-5	Yes	84	2.0E-05	0.014	3.82	0.014	4.21
Chlorine	7782-50-5	Yes	96	1.2E-03	0.84	232	0.84	256
Chlorobenzene	108-90-7	Yes	102	1.7E-05	0.011	3.16	0.011	3.48
Chloroform	67-66-3	Yes	107	2.0E-05	0.014	3.82	0.014	4.21
Crotonaldehyde	4170-30-3	No	132	4.5E-05	0.031	8.54	0.031	9.41
Dibutyl phthalate	84-74-2	Yes	161	3.3E-05	0.023	6.33	0.023	6.98
Diethylphthalate	84-66-2	No	186	2.2E-05	0.015	4.15	0.015	4.57
Ethyl benzene	100-41-4	Yes	221	4.0E-04	0.27	75.1	0.27	82.8
Formaldehyde	50-00-0	Yes	240	1.0E-03	0.70	194	0.70	214
Hexane	110-54-3	Yes	262	2.9E-04	0.20	54.8	0.20	60.3
Isopropyl alcohol	67-63-0	No	274	3.6E-03	2.50	692	2.50	763
Methanol	67-56-1	Yes	288	7.3E-04	0.50	139	0.50	153
Methyl bromide	74-83-9	Yes	64	1.1E-05	7.8E-03	2.17	7.8E-03	2.39
Methyl chloride	74-87-3	Yes	108	3.8E-05	0.026	7.19	0.026	7.92
Methyl chloroform	71-55-6	Yes	572	5.8E-05	0.040	11.0	0.040	12.1
Methylene chloride	75-09-2	Yes	170	5.5E-04	0.38	104	0.38	115
Methyl ethyl ketone	78-93-3	No	68	1.6E-05	0.011	2.97	0.011	3.27
Phenol	108-95-2	Yes	383	1.6E-04	0.11	30.4	0.11	33.5
Phosphorus	7723-14-0	Yes	392	5.5E-03	3.75	1,037	3.75	1,142
Propionaldehyde	123-38-6	Yes	510	2.5E-04	0.17	47.9	0.17	52.8
Styrene	100-42-5	Yes	536	4.8E-04	0.33	90.7	0.33	100.0
Toluene	108-88-3	Yes	555	2.1E-05	0.015	4.01	0.015	4.42
m-Xylene	108-38-3	Yes	603	3.5E-06	2.4E-03	0.67	2.4E-03	0.74
p-Xylene	106-42-3	Yes	605	3.5E-06	2.4E-03	0.67	2.4E-03	0.74
o-Xylene	95-47-6	Yes	604	1.1E-05	7.8E-03	2.15	7.8E-03	2.37
Inorganic Compounds								
Hydrogen fluoride	7664-39-3	Yes	267	2.4E-04	0.16	44.7	0.16	49.2
Hydrochloric acid	7647-01-0	Yes	265	4.4E-03	3.00	829	3.00	914
PAHs								
Acenaphthene	83-32-9	Yes	458	8.5E-07	5.9E-04	0.16	5.9E-04	0.18
Acenaphthylene	208-96-8	Yes	459	4.7E-06	3.2E-03	0.89	3.2E-03	0.98
Anthracene	120-12-7	Yes	460	2.7E-06	1.8E-03	0.51	1.8E-03	0.56
Benz[a]anthracene	56-55-3	Yes	462	8.1E-08	5.6E-05	0.015	5.6E-05	0.017
Benzo[a]pyrene	50-32-8	Yes	463	2.7E-06	1.9E-03	0.52	1.9E-03	0.57
Benzo[b]fluoranthene	205-99-2	Yes	464	1.4E-07	9.8E-05	0.027	9.8E-05	0.030
Benzo[e]pyrene	192-97-2	Yes	466	2.1E-07	1.5E-04	0.040	1.5E-04	0.044
Benzo[g,h,i]perylene	191-24-2	Yes	467	1.5E-07	1.0E-04	0.029	1.0E-04	0.032
Benzo[j]fluoranthene	205-82-3	Yes	468	1.6E-07	1.1E-04	0.030	1.1E-04	0.033
Benzo[k]fluoranthene	207-08-9	Yes	469	5.2E-08	3.6E-05	9.9E-03	3.6E-05	0.011
Chrysene	218-01-9	Yes	471	7.9E-08	5.4E-05	0.015	5.4E-05	0.017
Dibenzo[a,h]anthracene	53-70-3	Yes	476	9.6E-09	6.6E-06	1.8E-03	6.6E-06	2.0E-03
Fluoranthene	206-44-0	Yes	482	1.7E-06	1.1E-03	0.32	1.1E-03	0.35
Fluorene	86-73-7	Yes	483	3.0E-06	2.1E-03	0.57	2.1E-03	0.63
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	484	1.0E-07	7.0E-05	0.019	7.0E-05	0.021
2-Methyl naphthalene	91-57-6	Yes	485	1.4E-06	9.6E-04	0.27	9.6E-04	0.29
Naphthalene	91-20-3	Yes	320	1.0E-04	0.068	18.9	0.068	20.9
Perylene	198-55-0	Yes	486	3.2E-08	2.2E-05	6.1E-03	2.2E-05	6.7E-03
Phenanthrene	85-01-8	Yes	487	6.5E-06	4.4E-03	1.23	4.4E-03	1.35
Pyrene	129-00-0	Yes	488	3.5E-06	2.4E-03	0.67	2.4E-03	0.74
Dioxans & Furans								
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	440	6.3E-13	4.4E-10	1.2E-07	4.4E-10	1.3E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	441	1.4E-12	9.5E-10	2.6E-07	9.5E-10	2.9E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	442	9.2E-13	6.3E-10	1.8E-07	6.3E-10	1.9E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	443	2.2E-12	1.5E-09	4.2E-07	1.5E-09	4.6E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	444	2.3E-12	1.6E-09	4.3E-07	1.6E-09	4.8E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	445	9.9E-12	6.8E-09	1.9E-06	6.8E-09	2.1E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	446	2.5E-11	1.7E-08	4.8E-06	1.7E-08	5.2E-06
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	447	8.3E-12	5.7E-09	1.6E-06	5.7E-09	1.7E-06
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	448	4.1E-12	2.8E-09	7.8E-07	2.8E-09	8.6E-07
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	449	5.7E-12	3.9E-09	1.1E-06	3.9E-09	1.2E-06
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	450	3.6E-12	2.5E-09	6.9E-07	2.5E-09	7.6E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	451	3.2E-12	2.2E-09	6.0E-07	2.2E-09	6.6E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	452	6.6E-13	4.6E-10	1.3E-07	4.6E-10	1.4E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	453	2.7E-12	1.9E-09	5.1E-07	1.9E-09	5.6E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	454	5.8E-12	4.0E-09	1.1E-06	4.0E-09	1.2E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	455	9.3E-13	6.4E-10	1.8E-07	6.4E-10	2.0E-07
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	456	5.2E-12	3.5E-09	9.8E-07	3.5E-09	1.1E-06
Total TAC Emissions Estimate					21.2	5,853	21.2	6,448
Total HAP Emissions Estimate					13.7	3,781	13.7	4,165

Notes:
 (a) Maximum daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (maximum daily heat input [MMBtu/day])
 Maximum daily heat input (MMBtu/day) = 688 (2)
 (b) Annual emissions estimate (lb/yr) = (emission factor [lb/MMBtu]) x (annual heat input [MMBtu/yr])
 2018 annual heat input (MMBtu/yr) = 190,234 (2)
 PTE annual heat input (MMBtu/yr) = 209,547 (2)

References:
 (1) Provided by the Oregon Department of Environmental Quality. Assumes wood-fired boiler, mechanical control.
 (2) See Table 1, Input Process Rates and Parameters.

Table 4
Kiln 1 TAC Emission Estimates
Collins Pine, Lakeview Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/Mbdft)			Maximum Emission Factor (lb/Mbdft)	2018 Emission Estimates		PTE Emission Estimates	
				Ponderosa Pine ⁽¹⁾	Lodgepole Pine ⁽¹⁾	White Fir ⁽¹⁾		Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.042	0.012	0.055	0.055	2.73	854	2.73	1,265
Acrolein	107-02-8	Yes	6	1.7E-03	1.7E-03	1.5E-03	1.7E-03	0.085	26.4	0.085	39.1
Formaldehyde	50-00-0	Yes	240	2.8E-03	4.0E-03	2.8E-03	4.0E-03	0.20	62.1	0.20	92.0
Methanol	67-56-1	Yes	288	0.055	0.073	0.12	0.12	6.07	1,893	6.07	2,806
Propionaldehyde	123-38-6	Yes	510	1.9E-03	1.9E-03	1.2E-03	1.9E-03	0.094	29.5	0.094	43.7
Total TAC Emissions Estimate								9.18	2,865	9.18	4,246
Total HAP Emissions Estimate								9.18	2,865	9.18	4,246

Notes:

(a) Maximum daily emissions estimate (lb/day) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (maximum daily kiln 1 throughput [Mbdft/day])

Maximum daily kiln 1 throughput (Mbdft/day) = 49.7 (2)

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (annual kiln 1 throughput [Mbdft/yr])

2018 annual kiln 1 throughput (Mbdft/yr) = 15,518 (2)

PTE annual kiln 1 throughput (Mbdft/yr) = 22,999 (2)

References:

(1) 2015 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns - ODEQ and EPA Region 10.

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

Table 5
Kiln 2 TAC Emission Estimates
Collins Pine, Lakeview Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/Mbdft)			Maximum Emission Factor (lb/Mbdft)	2018 Emission Estimates		PTE Emission Estimates	
				Ponderosa Pine ⁽¹⁾	Lodgepole Pine ⁽¹⁾	White Fir ⁽¹⁾		Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.042	0.012	0.055	0.055	2.73	854	2.73	1,265
Acrolein	107-02-8	Yes	6	1.7E-03	1.7E-03	1.5E-03	1.7E-03	0.085	26.4	0.085	39.1
Formaldehyde	50-00-0	Yes	240	2.8E-03	4.0E-03	2.8E-03	4.0E-03	0.20	62.1	0.20	92.0
Methanol	67-56-1	Yes	288	0.055	0.073	0.12	0.12	6.07	1,893	6.07	2,806
Propionaldehyde	123-38-6	Yes	510	1.9E-03	1.9E-03	1.2E-03	1.9E-03	0.094	29.5	0.094	43.7
Total TAC Emissions Estimate								9.18	2,865	9.18	4,246
Total HAP Emissions Estimate								9.18	2,865	9.18	4,246

Notes:

(a) Maximum daily emissions estimate (lb/day) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (maximum daily kiln 1 throughput [Mbdft/day])

Maximum daily kiln 2 throughput (Mbdft/day) = 49.7 (2)

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (annual kiln 1 throughput [Mbdft/yr])

2018 annual kiln 2 throughput (Mbdft/yr) = 15,518 (2)

PTE annual kiln 2 throughput (Mbdft/yr) = 22,999 (2)

References:

(1) 2015 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns - ODEQ and EPA Region 10.

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

Table 6
Kiln 3 TAC Emission Estimates
Collins Pine, Lakeview Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/Mbdft)			Maximum Emission Factor (lb/Mbdft)	2018 Emission Estimates		PTE Emission Estimates	
				Ponderosa Pine ⁽¹⁾	Lodgepole Pine ⁽¹⁾	White Fir ⁽¹⁾		Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.042	0.012	0.055	0.055	3.25	1,015	3.25	1,505
Acrolein	107-02-8	Yes	6	1.7E-03	1.7E-03	1.5E-03	1.7E-03	0.10	31.4	0.10	46.5
Formaldehyde	50-00-0	Yes	240	2.8E-03	4.0E-03	2.8E-03	4.0E-03	0.24	73.8	0.24	109
Methanol	67-56-1	Yes	288	0.055	0.073	0.12	0.12	7.22	2,252	7.22	3,338
Propionaldehyde	123-38-6	Yes	510	1.9E-03	1.9E-03	1.2E-03	1.9E-03	0.11	35.1	0.11	52.0
Total TAC Emissions Estimate								10.9	3,408	10.9	5,051
Total HAP Emissions Estimate								10.9	3,408	10.9	5,051

Notes:

(a) Maximum daily emissions estimate (lb/day) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (maximum daily kiln 1 throughput [Mbdft/day])

Maximum daily kiln 3 throughput (Mbdft/day) = 59.1 (2)

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (annual kiln 1 throughput [Mbdft/yr])

2018 annual kiln 3 throughput (Mbdft/yr) = 18,462 (2)

PTE annual kiln 3 throughput (Mbdft/yr) = 27,361 (2)

References:

(1) 2015 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns - ODEQ and EPA Region 10.

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

Table 7
Kiln 4 TAC Emission Estimates
Collins Pine, Lakeview Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	ODEQ Sequence Number	Emission Factor (lb/Mbdft)			Maximum Emission Factor (lb/Mbdft)	2018 Emission Estimates		PTE Emission Estimates	
				Ponderosa Pine ⁽¹⁾	Lodgepole Pine ⁽¹⁾	White Fir ⁽¹⁾		Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Maximum Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Acetaldehyde	75-07-0	Yes	1	0.042	0.012	0.055	0.055	1.73	540	1.73	800
Acrolein	107-02-8	Yes	6	1.7E-03	1.7E-03	1.5E-03	1.7E-03	0.053	16.7	0.053	24.7
Formaldehyde	50-00-0	Yes	240	2.8E-03	4.0E-03	2.8E-03	4.0E-03	0.13	39.2	0.13	58.2
Methanol	67-56-1	Yes	288	0.055	0.073	0.12	0.12	3.83	1,197	3.83	1,774
Propionaldehyde	123-38-6	Yes	510	1.9E-03	1.9E-03	1.2E-03	1.9E-03	0.060	18.6	0.060	27.6
Total TAC Emissions Estimate								5.80	1,811	5.80	2,684
Total HAP Emissions Estimate								5.80	1,811	5.80	2,684

Notes:

(a) Maximum daily emissions estimate (lb/day) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (maximum daily kiln 1 throughput [Mbdft/day])

Maximum daily kiln 4 throughput (Mbdft/day) = 31.4 (2)

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of Ponderosa Pine, Lodgepole Pine, or White Fir [lb/Mbdft]) x (annual kiln 1 throughput [Mbdft/yr])

2018 annual kiln 4 throughput (Mbdft/yr) = 9,811 (2)

PTE annual kiln 4 throughput (Mbdft/yr) = 14,540 (2)

References:

(1) 2015 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns - ODEQ and EPA Region 10.

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

**Table 8
Tree Marking Paint TAC Emission Estimates
Collins Pine, Lakeview Oregon**

Product	Air Toxic ⁽¹⁾	CAS	HAP? (Yes/No)	ODEQ Sequence Number	% Weight Pollutant ⁽²⁾	Specific Gravity ⁽³⁾	Product Density ^(a) (lb/gallon)	2018 Emissions Estimate		PTE Emissions Estimate	
								Maximum Daily ^(b) (lb/day)	Annual ^(c) (lb/yr)	Maximum Daily ^(b) (lb/day)	Annual ^(c) (lb/yr)
Tree Marking Paint - Aerosol	Acetone	67-64-1	No	3	45.0	0.80	6.68	0.29	90.1	0.29	108
	Hexane	110-54-3	Yes	262	10.0			0.064	20.0	0.064	24.0
Total Emissions Estimate								0.35	110	0.35	132
Total HAP Emissions Estimate								0.064	20.0	0.064	24.0

Notes:

(a) Product density (lb/gal) = (specific gravity) x (density of water [lb/gal])

$$\text{Density of water (lb/gal)} = 8.345 \quad (4)$$

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

$$\text{Maximum daily product usage (gal/day)} = 0.096 \quad (5)$$

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

$$\text{2018 annual product usage (gal/yr)} = 30.0 \quad (5)$$

$$\text{PTE annual product usage (gal/yr)} = 36.0 \quad (5)$$

References:

- (1) Information from Safety Data Sheet provided by client.
- (2) Information Safety Data Sheet provided by client. Assumes midpoint of range.
- (3) Information provided by vendor.
- (4) Density of water at 4 degrees Celsius.
- (5) See Table 1, Input Process Rates and Parameters.

**Table 9
Inline Ink TAC Emission Estimates
Collins Pine, Lakeview Oregon**

Product	Air Toxic ⁽¹⁾	CAS	HAP? (Yes/No)	ODEQ Sequence Number	% Weight Pollutant ⁽¹⁾	Specific Gravity ⁽¹⁾	Product Density ^(a) (lb/gallon)	2018 Emissions Estimate		PTE Emissions Estimate	
								Maximum Daily ^(b) (lb/day)	Annual ^(c) (lb/yr)	Maximum Daily ^(b) (lb/day)	Annual ^(c) (lb/yr)
WVCO Black Ink	Isopropyl Alcohol	67-63-0	No	274	3.00	1.00	8.35	0.87	270	0.87	324
Total TAC Emissions Estimate								0.87	270	0.87	324
Total HAP Emissions Estimate								--	--	--	--

Notes:

(a) Product density (lb/gal) = (specific gravity) x (density of water [lb/gal])

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

(b) Maximum 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) = 3.46 (3)

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

2018 annual product usage (gal/yr) = 1,080 (3)

PTE annual product usage (gal/yr) = 1,296 (3)

References:

(1) Information provided by Safety Data Sheet.

(2) Density of water at 4 degrees Celsius.

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

Table 11
PTE Emission Estimates Summary
Collins Pine, Lakeview Oregon



Table with columns: Toxic Air Contaminant, CAS, HAP? (Yes/No), OQIQ Sequence Number, Boilers (1-2), Kins (1-3), Heat Exchangers (1-2), Pans, Point, Ink, and Facility Total. Rows include Metals (Antimony, Arsenic, Barium, etc.), Organic Compounds (1,2-Dichloropropane, Acetaldehyde, etc.), Inorganic Compounds (Hydrogen fluoride, Sulfuric acid), PAHs (Acenaphthene, Acenaphthylene, etc.), Dioxins & Furans, and a Total HAP Emissions Estimate row.