

Table 1
Clarifier WWTP (EU129A) Toxic Air Contaminant Emissions Estimate
Georgia Pacific – Toledo, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Modeled Emission Rate ⁽¹⁾ (g/s)	Emission Factor		Emissions Estimate	
					Short-Term (lb/hr)	Long-Term (lb/hr)	Daily (lb/day)	Annual (lb/yr)
Acetaldehyde	75-07-0	Yes	Yes	4.4E-03	0.070 ^(a)	0.035 ^(b)	1.69 ^(c)	308 ^(d)
Formaldehyde	50-00-0	Yes	Yes	2.1E-05	3.3E-04 ^(a)	1.6E-04 ^(b)	7.9E-03 ^(c)	1.44 ^(d)
Hydrogen sulfide	7783-06-4	No	Yes	--	0.018 ^(e)	6.6E-03 ^(f)	0.43 ^(g)	58.1 ^(h)
Methanol	67-56-1	Yes	Yes	0.039	0.62 ^(a)	0.31 ^(b)	14.9 ^(c)	2,711 ^(d)
2-Butanone (Methyl ethyl ketone)	78-93-3	No	Yes	3.5E-03	0.055 ^(a)	0.028 ^(b)	1.32 ^(c)	242 ^(d)
Total TAC Emissions Estimate							18.3	3,320
Total RBC Emissions Estimate							18.3	3,320

NOTES:

HAP = Hazardous Air Pollutant.

RBC = Risk Based Concentration.

TAC = Toxic Air Contaminant.

(a) Short-term emission factor (lb/hr) = (modeled emission rate [g/s]) x (short term multiplier) / (453.592 g/lb) x (3,600 s/hr)
Short term multiplier = 2.0 (2)

(b) Long-term emission factor (lb/hr) = (modeled emission rate [g/s]) / (453.592 g/lb) x (3,600 s/hr)

(c) Daily emissions estimate (lb/day) = (short-term emission factor [lb/hr]) x (24 hrs/day)

(d) Annual emissions estimate (lb/yr) = (long-term emission factor [lb/hr]) x (8,760 hr/yr)

(e) Short-term emission factor (lb/hr) = (daily emissions estimate [lb/day]) / (24 hrs/day)

(f) Long-term emission factor (lb/hr) = (annual emissions estimate [lb/yr]) / (8,760 hrs/yr)

(g) Daily emissions estimate (lb/day) = (NCASI WWTP daily emissions estimate [lb/day]) x (clarifier percentage of WWTP emissions [%] / 100)

NCASI WWTP daily emissions estimate (lb/day) = 25.4 (3)

Clarifier percentage of WWTP emissions (%) = 1.71 (4)

(h) Annual emissions estimate (lb/yr) = (NCASI WWTP annual emissions estimate [lb/yr]) x (clarifier percentage of WWTP emissions [%] / 100)

NCASI WWTP annual emissions estimate (lb/yr) = 3,395 (3)

Clarifier percentage of WWTP emissions (%) = 1.71 (4)

REFERENCES:

(1) Emission rate provided by NCASI based on water analysis and WATER 9 model. Water analysis results that were non-detect are included at 1/2 the detection level.

(2) EPA multiplier for short-term (i.e. daily) emission rates used in NESHAP Subparts S and MM Residual Risk and Technology Review. See RTI memorandum dated November 11, 2011.

(3) Emission rate provided by NCASI based on ambient monitoring data.

(4) Clarifier percentage of total system emissions based on previous modeling analyses performed by NCASI and Georgia Pacific. Daily emissions include the short term multiplier.

Table 2
Thermal Ponds WWTP (EU129B) Toxic Air Contaminant Emissions Estimate
Georgia Pacific – Toledo, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Modeled Emission Rate ⁽²⁾ (g/s)	Emission Factor		Emissions Estimate	
					Short-Term (lb/hr)	Long-Term (lb/hr)	Daily (lb/day)	Annual (lb/yr)
Acetaldehyde	75-07-0	Yes	Yes	9.5E-03	0.15 ^(a)	0.075 ^(b)	3.62 ^(c)	660 ^(d)
Formaldehyde	50-00-0	Yes	Yes	5.1E-05	8.1E-04 ^(a)	4.0E-04 ^(b)	0.019 ^(c)	3.53 ^(d)
Hydrogen sulfide	7783-06-4	No	Yes	--	0.68 ^(e)	0.25 ^(f)	16.4 ^(g)	2,189 ^(h)
Methanol	67-56-1	Yes	Yes	0.019	0.29 ^(a)	0.15 ^(b)	7.05 ^(c)	1,286 ^(d)
2-Butanone (Methyl ethyl ketone)	78-93-3	No	Yes	9.5E-03	0.15 ^(a)	0.075 ^(b)	3.60 ^(c)	657 ^(d)
Total TAC Emissions Estimate							30.7	4,796
Total RBC Emissions Estimate							30.7	4,796

NOTES:

HAP = Hazardous Air Pollutant.

RBC = Risk Based Concentration.

TAC = Toxic Air Contaminant.

(a) Short-term emission factor (lb/hr) = (modeled emission rate [g/s]) x (short term multiplier) / (453.592 g/lb) x (3,600 s/hr)
Short term multiplier = 2.0 (2)

(b) Long-term emission factor (lb/hr) = (modeled emission rate [g/s]) / (453.592 g/lb) x (3,600 s/hr)

(c) Daily emissions estimate (lb/day) = (short-term emission factor [lb/hr]) x (24 hrs/day)

(d) Annual emissions estimate (lb/yr) = (long-term emission factor [lb/hr]) x (8,760 hr/yr)

(e) Short-term emission factor (lb/hr) = (daily emissions estimate [lb/day]) / (24 hrs/day)

(f) Long-term emission factor (lb/hr) = (annual emissions estimate [lb/yr]) / (8,760 hrs/yr)

(g) Daily emissions estimate (lb/day) = (NCASI WWTP daily emissions estimate [lb/day]) x (thermal ponds percentage of WWTP emissions [%] / 100)

NCASI WWTP daily emissions estimate (lb/day) = 25.4 (3)

Thermal ponds percentage of WWTP emissions (%) = 64.5 (4)

(h) Annual emissions estimate (lb/yr) = (NCASI WWTP annual emissions estimate [lb/yr]) x (thermal ponds percentage of WWTP emissions [%] / 100)

NCASI WWTP annual emissions estimate (lb/yr) = 3,395 (3)

Thermal ponds percentage of WWTP emissions (%) = 64.5 (4)

REFERENCES:

(1) Emission rate provided by NCASI based on water analysis and WATER 9 model. Water analysis results that were non-detect are included at 1/2 the detection level.

(2) EPA multiplier for short-term (i.e. daily) emission rates used in NESHAP Subparts S and MM Residual Risk and Technology Review. See RTI memorandum dated November 11, 2011.

(3) Emission rate provided by NCASI based on ambient monitoring data.

(4) Thermal ponds percentage of total system emissions based on previous modeling analyses performed by NCASI and Georgia Pacific. Daily emissions include the short term multiplier.

Table 3
Load Leveling Lagoon WWTP (EU129C) Toxic Air Contaminant Emissions Estimate
Georgia Pacific – Toledo, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Modeled Emission Rate ⁽¹⁾ (g/s)	Emission Factor		Emissions Estimate	
					Short-Term (lb/hr)	Long-Term (lb/hr)	Daily (lb/day)	Annual (lb/yr)
Acetaldehyde	75-07-0	Yes	Yes	6.6E-04	0.011 ^(a)	5.3E-03 ^(b)	0.25 ^(c)	46.1 ^(d)
Formaldehyde	50-00-0	Yes	Yes	6.0E-06	9.5E-05 ^(a)	4.7E-05 ^(b)	2.3E-03 ^(c)	0.42 ^(d)
Hydrogen sulfide	7783-06-4	No	Yes	--	0.16 ^(e)	0.057 ^(f)	3.75 ^(g)	501 ^(h)
Methanol	67-56-1	Yes	Yes	6.8E-05	1.1E-03 ^(a)	5.4E-04 ^(b)	0.026 ^(c)	4.69 ^(d)
2-Butanone (Methyl ethyl ketone)	78-93-3	No	Yes	4.2E-04	6.7E-03 ^(a)	3.4E-03 ^(b)	0.16 ^(c)	29.4 ^(d)
Total TAC Emissions Estimate							4.19	581
Total RBC Emissions Estimate							4.19	581

NOTES:

HAP = Hazardous Air Pollutant.

RBC = Risk Based Concentration.

TAC = Toxic Air Contaminant.

(a) Short-term emission factor (lb/hr) = (modeled emission rate [g/s]) x (short term multiplier) / (453.592 g/lb) x (3,600 s/hr)
Short term multiplier = 2.0 (2)

(b) Long-term emission factor (lb/hr) = (modeled emission rate [g/s]) / (453.592 g/lb) x (3,600 s/hr)

(c) Daily emissions estimate (lb/day) = (short-term emission factor [lb/hr]) x (24 hrs/day)

(d) Annual emissions estimate (lb/yr) = (long-term emission factor [lb/hr]) x (8,760 hr/yr)

(e) Short-term emission factor (lb/hr) = (daily emissions estimate emission rate [lb/day]) / (24 hrs/day)

(f) Long-term emission factor (lb/hr) = (annual emissions estimate emission rate [lb/yr]) / (8,760 hrs/yr)

(g) Daily emissions estimate (lb/day) = (NCASI WWTP daily emissions estimate [lb/day]) x (load level lagoon percentage of WWTP emissions [%] / 100)

NCASI WWTP daily emissions estimate (lb/day) = 25.4 (3)

Load level lagoon percentage of WWTP emissions (%) = 14.7 (4)

(h) Annual emissions estimate (lb/yr) = (NCASI WWTP annual emissions estimate [lb/yr]) x (load level lagoon percentage of WWTP emissions [%] / 100)

NCASI WWTP annual emissions estimate (lb/yr) = 3,395 (3)

Load level lagoon percentage of WWTP emissions (%) = 14.7 (4)

REFERENCES:

(1) Emission rate provided by NCASI based on water analysis and WATER 9 model. Water analysis results that were non-detect are included at 1/2 the detection level.

(2) EPA multiplier for short-term (i.e. daily) emission rates used in NESHAP Subparts S and MM Residual Risk and Technology Review. See RTI memorandum dated November 11, 2011.

(3) Emission rate provided by NCASI based on ambient monitoring data.

(4) Load level lagoon percentage of total system emissions based on previous modeling analyses performed by NCASI and Georgia Pacific. Daily emissions include the short term multiplier.

Table 4
Treatment Pond WWTP (EU129D) Toxic Air Contaminant Emissions Estimate
Georgia Pacific – Toledo, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Modeled Emission Rate ⁽¹⁾ (g/s)	Emission Factor		Emissions Estimate	
					Short-Term (lb/hr)	Long-Term (lb/hr)	Daily (lb/day)	Annual (lb/yr)
Acetaldehyde	75-07-0	Yes	Yes	1.0E-04	1.6E-03 ^(a)	8.1E-04 ^(b)	0.039 ^(c)	7.13 ^(d)
Formaldehyde	50-00-0	Yes	Yes	6.8E-07	1.1E-05 ^(a)	5.4E-06 ^(b)	2.6E-04 ^(c)	0.047 ^(d)
Hydrogen sulfide	7783-06-4	No	Yes	--	0.20 ^(e)	0.073 ^(f)	4.80 ^(g)	641 ^(h)
Methanol	67-56-1	Yes	Yes	5.0E-03	0.079 ^(a)	0.040 ^(b)	1.90 ^(c)	348 ^(d)
2-Butanone (Methyl ethyl ketone)	78-93-3	No	Yes	6.8E-05	1.1E-03 ^(a)	5.4E-04 ^(b)	0.026 ^(c)	4.69 ^(d)
Total TAC Emissions Estimate							6.77	1,000
Total RBC Emissions Estimate							6.77	1,000

NOTES:

HAP = Hazardous Air Pollutant.

RBC = Risk Based Concentration.

TAC = Toxic Air Contaminant.

(a) Short-term emission factor (lb/hr) = (modeled emission rate [g/s]) x (short term multiplier) / (453.592 g/lb) x (3,600 s/hr)
 Short term multiplier = 2.0 (2)

(b) Long-term emission factor (lb/hr) = (modeled emission rate [g/s]) / (453.592 g/lb) x (3,600 s/hr)

(c) Daily emissions estimate (lb/day) = (short-term emission factor [lb/hr]) x (24 hrs/day)

(d) Annual emissions estimate (lb/yr) = (long-term emission factor [lb/hr]) x (8,760 hr/yr)

(e) Short-term emission factor (lb/hr) = (daily emissions estimate emission rate [lb/day]) / (24 hrs/day)

(f) Long-term emission factor (lb/hr) = (annual emissions estimate emission rate [lb/yr]) / (8,760 hrs/yr)

(g) Daily emissions estimate (lb/day) = (NCASI WWTP daily emissions estimate [lb/day]) x (treatment ponds percentage of WWTP emissions [%] / 100)

NCASI WWTP daily emissions estimate (lb/day) = 25.4 (3)

Treatment ponds percentage of WWTP emissions (%) = 18.9 (4)

(h) Annual emissions estimate (lb/yr) = (NCASI WWTP annual emissions estimate [lb/yr]) x (treatment ponds percentage of WWTP emissions [%] / 100)

NCASI WWTP annual emissions estimate (lb/yr) = 3,395 (3)

Treatment ponds percentage of WWTP emissions (%) = 18.9 (4)

REFERENCES:

(1) Emission rate provided by NCASI based on water analysis and WATER 9 model. Water analysis results that were non-detect are included at 1/2 the detection level.

(2) EPA multiplier for short-term (i.e. daily) emission rates used in NESHAP Subparts S and MM Residual Risk and Technology Review. See RTI memorandum dated November 11, 2011.

(3) Emission rate provided by NCASI based on ambient monitoring data.

(4) Treatment ponds percentage of total system emissions based on previous modeling analyses performed by NCASI and Georgia Pacific. Daily emissions include the short term multiplier.

Table 5
Settling Pond WWTP (EU129E) Toxic Air Contaminant Emissions Estimate
Georgia Pacific – Toledo, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Modeled Emission Rate ⁽¹⁾ (g/s)	Emission Factor		Emissions Estimate	
					Short-Term (lb/hr)	Long-Term (lb/hr)	Daily (lb/day)	Annual (lb/yr)
Acetaldehyde	75-07-0	Yes	Yes	0	0 ^(a)	0 ^(b)	0 ^(c)	0 ^(d)
Formaldehyde	50-00-0	Yes	Yes	0	0 ^(a)	0 ^(b)	0 ^(c)	0 ^(d)
Hydrogen sulfide	7783-06-4	No	Yes	--	1.9E-03 ^(e)	6.9E-04 ^(f)	0.045 ^(g)	6.01 ^(h)
Methanol	67-56-1	Yes	Yes	0	0 ^(a)	0 ^(b)	0 ^(c)	0 ^(d)
2-Butanone (Methyl ethyl ketone)	78-93-3	No	Yes	0	0 ^(a)	0 ^(b)	0 ^(c)	0 ^(d)
Total TAC Emissions Estimate							0.045	6.01
Total RBC Emissions Estimate							0.045	6.01

NOTES:

HAP = Hazardous Air Pollutant.

RBC = Risk Based Concentration.

TAC = Toxic Air Contaminant.

(a) Short-term emission factor (lb/hr) = (modeled emission rate [g/s]) x (short term multiplier) / (453.592 g/lb) x (3,600 s/hr)
 Short term multiplier = 2.0 (2)

(b) Long-term emission factor (lb/hr) = (modeled emission rate [g/s]) / (453.592 g/lb) x (3,600 s/hr)

(c) Daily emissions estimate (lb/day) = (short-term emission factor [lb/hr]) x (24 hrs/day)

(d) Annual emissions estimate (lb/yr) = (long-term emission factor [lb/hr]) x (8,760 hr/yr)

(e) Short-term emission factor (lb/hr) = (daily emissions estimate emission rate [lb/day]) / (24 hrs/day)

(f) Long-term emission factor (lb/hr) = (annual emissions estimate emission rate [lb/yr]) / (8,760 hrs/yr)

(g) Daily emissions estimate (lb/day) = (NCASI WWTP daily emissions estimate [lb/day]) x (settling pond percentage of WWTP emissions [%] / 100)

NCASI WWTP daily emissions estimate (lb/day) = 25.4 (3)

Settling pond percentage of WWTP emissions (%) = 0.18 (4)

(h) Annual emissions estimate (lb/yr) = (NCASI WWTP annual emissions estimate [lb/yr]) x (settling pond percentage of WWTP emissions [%] / 100)

NCASI WWTP annual emissions estimate (lb/yr) = 3,395 (3)

Settling pond percentage of WWTP emissions (%) = 0.18 (4)

REFERENCES:

(1) Emission rate provided by NCASI based on water analysis and WATER 9 model. Water analysis results that were non-detect are included at 1/2 the detection level.

(2) EPA multiplier for short-term (i.e. daily) emission rates used in NESHAP Subparts S and MM Residual Risk and Technology Review. See RTI memorandum dated November 11, 2011.

(3) Emission rate provided by NCASI based on ambient monitoring data.

(4) Settling pond percentage of total system emissions based on previous modeling analyses performed by NCASI and Georgia Pacific. Daily emissions include the short term multiplier.

Table 6
Emergency Diesel Engines Toxic Air Contaminant Emissions Estimate
Georgia Pacific – Toledo, Oregon

Parameter	EU134	EU135	EU136	EU137	EU145
Emission Unit Description	No. 2 Fire Pump	Fire Pump NW of Boiler No. 4	Turbine Generator	Outfall 003 Standby Engine	Juno Emergency Generator
Engine Size (1)	196	196	125	104	170
Maximum Daily Operating Hours (1)	24	24	24	24	24
Annual Operating Hours (1)	500	500	500	500	500

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Emission Factors		Emissions Estimates									
						EU134		EU135		EU136		EU137		EU145	
						Daily (a) (lb/day)	Annual (b) (lb/yr)	Daily (a) (lb/day)	Annual (b) (lb/yr)	Daily (a) (lb/day)	Annual (b) (lb/yr)	Daily (a) (lb/day)	Annual (b) (lb/yr)	Daily (a) (lb/day)	Annual (b) (lb/yr)
Acetaldehyde	75-07-0	Yes	Yes	7.7E-04 (lb/MMBtu) (2)	5.4E-06 (lb/hp-hr) (c)	0.025	0.53	0.025	0.53	0.016	0.34	0.013	0.28	0.022 (a) (lb/day)	0.46 (b) (lb/yr)
Benzene	71-43-2	Yes	Yes	9.3E-04 (lb/MMBtu) (2)	6.5E-06 (lb/hp-hr) (c)	0.031	0.64	0.031	0.64	0.020	0.41	0.016	0.34	0.027 (a) (lb/day)	0.56 (b) (lb/yr)
Benzo(a)pyrene	50-32-8	Yes	Yes	1.9E-07 (lb/MMBtu) (2)	1.3E-09 (lb/hp-hr) (c)	6.2E-06	1.3E-04	6.2E-06	1.3E-04	3.9E-06	8.2E-05	3.3E-06	6.8E-05	5.4E-06 (a) (lb/day)	1.1E-04 (b) (lb/yr)
Formaldehyde	50-00-0	Yes	Yes	1.2E-03 (lb/MMBtu) (2)	8.3E-06 (lb/hp-hr) (c)	0.039	0.81	0.039	0.81	0.025	0.52	0.021	0.43	0.034 (a) (lb/day)	0.70 (b) (lb/yr)
Naphthalene	91-20-3	Yes	Yes	8.5E-05 (lb/MMBtu) (2)	5.9E-07 (lb/hp-hr) (c)	2.8E-03	0.058	2.8E-03	0.058	1.8E-03	0.037	1.5E-03	0.031	2.4E-03 (a) (lb/day)	0.050 (b) (lb/yr)
Polycyclic aromatic hydrocarbons (PAHs)	401	Yes	No	8.3E-05 (lb/MMBtu) (4)	5.8E-07 (lb/hp-hr) (c)	2.7E-03	0.057	2.7E-03	0.057	1.7E-03	0.036	1.5E-03	0.030	2.4E-03 (a) (lb/day)	0.050 (b) (lb/yr)
Propylene	115-07-1	No	Yes	2.6E-03 (lb/MMBtu) (2)	1.8E-05 (lb/hp-hr) (c)	0.085	1.77	0.085	1.77	0.054	1.13	0.045	0.94	0.074 (a) (lb/day)	1.54 (b) (lb/yr)
Toluene	108-88-3	Yes	Yes	4.1E-04 (lb/MMBtu) (2)	2.9E-06 (lb/hp-hr) (c)	0.013	0.28	0.013	0.28	8.6E-03	0.18	7.1E-03	0.15	0.012 (a) (lb/day)	0.24 (b) (lb/yr)
Xylene (mixture), including m-xylene, o-xylene, p-xylene	1330-20-7	Yes	Yes	2.9E-04 (lb/MMBtu) (2)	2.0E-06 (lb/hp-hr) (c)	9.4E-03	0.20	9.4E-03	0.20	6.0E-03	0.12	5.0E-03	0.10	8.1E-03 (a) (lb/day)	0.17 (b) (lb/yr)
DIESEL PARTICULATE MATTER (DPM)															
Total DPM	200	No	No	--	--	10.5	218	10.5	218	6.68	139	5.56	116	1.40	29.1
DPM from Normal Operation	--	--	--	0.32 (lb/MMBtu) (5)	2.2E-03 (lb/hp-hr) (c)	10.5	218	10.5	218	6.67	139	5.55	116	1.39 (e) (lb/day)	28.9 (f) (lb/yr)
DPM from Cold Start	--	--	--	1.84 (g/kW-hr) (7)	3.0E-03 (lb/hp-hr) (c)	9.9E-03	0.20	9.9E-03	0.20	6.3E-03	0.13	5.2E-03	0.10	8.6E-03 (g) (lb/day)	0.17 (h) (lb/yr)
Total TAC Emissions Estimate						10.7	222	10.7	222	6.81	142	5.67	118	1.58	32.9
Total RBC Emissions Estimate						0.21	4.28	0.21	4.28	0.13	2.73	0.11	2.27	0.18	3.71

NOTES:

- Btu = British thermal units.
- HAP = Hazardous Air Pollutant.
- hp = horsepower.
- kW = kilowatts.
- MMBtu = million British thermal units.
- RBC = Risk Based Concentration.
- TAC = Toxic Air Contaminant.
- (a) Daily emissions estimate (lb/day) = (emission factor [lb/hp-hr]) x (engine size [hp]) x (maximum daily operating hours [hrs/day])
- (b) Annual emissions estimate (lb/yr) = (emission factor [lb/hp-hr]) x (engine size [hp]) x (annual operating hours [hrs/yr])
- (c) Emission factor (lb/hp-hr) = (emission factor [lb/MMBtu]) / (brake-specific fuel consumption [Btu/hp-hr]) / (1,000,000 Btu/MMBtu)
 - Brake-specific fuel consumption (Btu/hp-hr) = 7,000 (3)
- (d) Emission factor (lb/hp-hr) = (emission factor [g/kW-hr]) / (453.592 g/lb) / (1.341 hp/kW)
- (e) Daily emissions estimate (lb/day) = [(engine certification filterable PM emission factor [lb/hp-hr]) + (condensable PM emission factor [lb/hp-hr])] x (engine size [hp]) x (maximum daily operating hours [hrs/day])
 - Engine certification filterable PM emission factor (lb/hp-hr) = 2.9E-04 (1)
 - Condensable PM emission factor (lb/hp-hr) = 5.4E-05 (6)
- (f) Annual emissions estimate (lb/yr) = [(engine certification filterable PM emission factor [lb/hp-hr]) + (condensable PM emission factor [lb/hp-hr])] x (engine size [hp]) x (annual operating hours [hrs/yr])
- (g) Daily emissions estimate (lb/day) = (emission factor [lb/hp-hr]) x (engine size [hp]) x (cold start duration [min/cold start]) / (60 min/hr) x (daily number of cold starts [cold starts/day])
 - Cold start duration (min/cold start) = 1.00 (1)
 - Daily number of cold starts (cold starts/day) = 1.00 (1)
- (h) Annual emissions estimate (tons/yr) = (emission factor [lb/hp-hr]) x (engine size [hp]) x (cold start duration [min/cold start]) / (60 min/hr) x (annual number of cold starts [cold starts/yr])
 - Cold start duration (min/cold start) = 1.00 (1)
 - Annual number of cold starts (cold starts/yr) = 20.0 (1)

REFERENCES:

- (1) Information provided by Georgia Pacific.
- (2) AP-42 Chapter 3.3 (October 1996), Table 3.3-2.
- (3) Brake-specific fuel consumption from footnote a in AP-42 Chapter 3.3 (October 1996), Table 3.3-1.
- (4) AP-42 Chapter 3.3 (October 1996), Table 3.3-2. Total PAH emission factor excludes naphthalene because risk is assessed separately for naphthalene.
- (5) Filterable particulate emission factor from AP-42 Chapter 3.3 (October 1996), Table 3.3-1 plus condensable particulate emission factor from AP-42 Chapter 3.4 (October 1996), Table 3.4-2.
- (6) AP-42 Chapter 3.4 (October 1996), Table 3.4-2.
- (7) USEPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards (EPA-420-B-16-022) dated March 2016. Assumes Tier 1 PM emission factor plus Tier 1 emission factor for NMHC is representative of DPM during uncontrolled cold start period.

Table 7
Non-Exempt Gasoline Engine Toxic Air Contaminant Emissions Estimate
Georgia Pacific – Toledo, Oregon

Parameter	EU141
Emission Unit Description	No. 2 Mud Tank Agitator Auxiliary Drive
Engine Size ⁽¹⁾	21
Maximum Daily Operating Hours ⁽¹⁾	24
Annual Operating Hours ⁽¹⁾	600

Toxic Air Contaminant	CAS	HAP? (Yes/No)	RBC? (Yes/No)	Emission Factors		Emissions Estimates	
				(lb/MMBtu)	(lb/hp-hr) ^(a)	EU141	
						Daily ^(b) (lb/day)	Annual ^(c) (lb/yr)
Acetaldehyde	75-07-0	Yes	Yes	7.7E-04 ⁽³⁾	5.4E-06	2.7E-03	0.068
Benzene	71-43-2	Yes	Yes	9.3E-04 ⁽³⁾	6.5E-06	3.3E-03	0.082
Benzo(a)pyrene	50-32-8	Yes	Yes	1.9E-07 ⁽³⁾	1.3E-09	6.6E-07	1.7E-05
Formaldehyde	50-00-0	Yes	Yes	1.2E-03 ⁽³⁾	8.3E-06	4.2E-03	0.10
Naphthalene	91-20-3	Yes	Yes	8.5E-05 ⁽³⁾	5.9E-07	3.0E-04	7.5E-03
Polycyclic aromatic hydrocarbons (PAHs)	401	Yes	Yes	8.3E-05 ⁽⁴⁾	5.8E-07	2.9E-04	7.3E-03
Propylene	115-07-1	No	Yes	2.6E-03 ⁽³⁾	1.8E-05	9.1E-03	0.23
Toluene	108-88-3	Yes	Yes	4.1E-04 ⁽³⁾	2.9E-06	1.4E-03	0.036
Xylene (mixture), including m-xylene, o-xylene, p-xylene	1330-20-7	Yes	Yes	2.9E-04 ⁽³⁾	2.0E-06	1.0E-03	0.025
Total TAC Emissions Estimate						0.022	0.56
Total RBC Emissions Estimate						0.022	0.56

NOTES:

Btu = British thermal units.

HAP = Hazardous Air Pollutant.

hp = horsepower.

MMBtu = million British thermal units.

RBC = Risk Based Concentration.

TAC = Toxic Air Contaminant.

(a) Emission factor (lb/hp-hr) = (emission factor [lb/MMBtu]) / (brake-specific fuel consumption [Btu/hp-hr]) / (1,000,000 Btu/MMBtu)
 Brake-specific fuel consumption [Btu/hp-hr] = 7,000 ⁽²⁾

(b) Daily emissions estimate (lb/day) = (emission factor [lb/hp-hr]) x (engine size [hp]) x (maximum daily operating hours [hrs/day])

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/hp-hr]) x (engine size [hp]) x (annual operating hours [hrs/yr])

REFERENCES:

(1) Information provided by Georgia Pacific.

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

(3) AP-42 Chapter 3.3 (October 1996), Table 3.3-2.

(4) AP-42 Chapter 3.3 (October 1996), Table 3.3-2. Total PAH emission factor excludes naphthalene because risk is assessed separately for naphthalene.

Table 8
Welding Emissions for Electrodes Exceeding the Reporting Threshold
Georgia Pacific – Toledo, Oregon

Product	Toxic Air Contaminant	CAS	Emission Factor ⁽¹⁾ (lb/Mlb electrode consumed)	Annual Emissions Estimate ^(a) (lb/yr)
SMAW E7018	Chromium (nonhexavalent)	7440-47-3	6.0E-03	4.7E-03
	Cobalt and compounds	7440-48-4	1.0E-03	7.9E-04
	Manganese and compounds	7439-96-5	1.03	0.81
	Nickel compounds, insoluble	365	2.0E-03	1.6E-03
Total TAC Emissions Estimate				0.82

NOTES:

Mlb = thousand pounds.

(a) Annual emissions estimate (lb/yr) = (emission factor [lb/Mlb]) x (annual electrode usage [lb/yr]) / (1,000 lb/Mlb)

Annual E7018 electrode usage (lb/yr) = 786 (2)

REFERENCES:

(1) 2020 Air Toxics Emissions Inventory Welding Emission Factor Search Tool provided by the Oregon Department of Environmental Quality.

(2) Information provided by Georgia Pacific.

Table 9
Level 1 Risk Assessment for Welding Electrodes Exceeding the Reporting Threshold
Georgia Pacific – Toledo, Oregon

Toxic Air Contaminant	CAS	Annual Emissions Estimate ⁽¹⁾ (lb/yr)	Risk Based Concentration ⁽²⁾ (ug/m ³)		Cancer Risk (Chances-in-1,000,000)	Chronic Noncancer Hazard Index
			Cancer	Chronic Noncancer		
Chromium (nonhexavalent)	7440-47-3	4.7E-03	--	--	--	--
Cobalt and compounds	7440-48-4	7.9E-04	--	0.10	--	3.5E-05
Manganese and compounds	7439-96-5	0.81	--	0.090	--	0.040
Nickel compounds, insoluble	365	1.6E-03	3.8E-03	0.014	1.9E-03	5.1E-04
Total Risk Estimate					1.9E-03	0.041

NOTES:

Mlb = thousand pounds.

(a) Cancer risk or chronic noncancer hazard index = (annual emissions estimate [lb/yr]) x (dispersion factor [ug/m³/lb/yr]) / (risk based concentration [ug/m³])
 Dispersion factor (ug/m³/lb/yr) = 0.0045 (3)

REFERENCES:

- (1) See Table 8, Welding Emissions for Electrodes Exceeding the Reporting Threshold.
- (2) OAR 340-245-8010 Table 2. The most restrictive value for residential, worker and child exposure is conservatively used.
- (3) OAR 340-245-8010 Table 3. Assumes the most conservative annual exposure dispersion factor for fugitive emission releases.