

Appendix F
Sample Calculations

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Section F-1 – Point Source OSD sample calculation

Base line ozone season day emission calculation – This sample is an actual combustion turbine with a low NOx burner and an SCR

$$\text{Ozone Season Day Emissions (OSD}_{\text{init}}) = (\text{fuel thruput/osd}) \times (\text{emission factor}) \times (1 - (\text{removal efficiency}/100))$$

The projected reductions are calculated as follows:

$$\text{OSD Emissions}_{\text{future}} = \text{OSD Emissions}_{\text{init}} \times \text{Growth Factor} \times (1 - (\text{CF}/100))$$

Where Growth Factor = SCC specific growth factor for the “new” year.

And CF = Control Factor = % additional control to be applied at this unit on or before the “new” year. For point sources, this is usually done on a case by case basis since some point sources already have the proposed control level installed. For example, the proposed control factor for process XYZ is 75 % removal – Facility A already has a control device that removes 75% (or more). At Facility A, the CF for this unit is 0. At Facility B, there is no control device. For Facility B, the CF is 75%.

Units	OSD emissions	– pounds per ozone season day (sometimes expressed in tons per ozone season day)
	Fuel thruput	– gallons of oil / ozone season day - could also be in cubic feet of natural gas or pounds of coal
	Emission factor	– pounds of emissions per unit of fuel – in this example, we are using pounds of emissions per gallon of oil burned
	Removal Efficiency	– this term is expressed as percent removal
	Growth Factor	– unitless this is a growth factor so units are pounds / pounds – hence unitless
	CE	– this term is expressed as percent additional removal from the base year

CF is calculated as follows

$$\text{CF} = \text{CE} \times \text{RP} \times \text{RE}$$

Where

CE is the control efficiency that is required for the emission category (e.g. cement kilns)

RP is the Rule Penetration – the degree a given rule penetrates the universe of emission processes coming under the purview of the rule (taking into account rule applicability, exemptions, etc.)

RE is the Rule Efficiency – the correction factor to adjust for "real-world" operating conditions (i.e. equipment breakdowns, operator

variance, compliance rate, etc.)

Section F2 – Area Source Growth and Control calculations

Annual and Ozone Season Day emissions for the 2002 baseline inventory were calculated according to the procedures contained in *The New York State Area Source Methodologies Manual* – See Appendix D.

The projected reductions are calculated as follows:

$$\text{OSD Emissions}_{\text{future}} = \text{OSD Emissions}_{\text{init}} \times \text{Growth Factor} \times (1 - (\text{CF}/100))$$

Where Growth Factor = SCC specific growth factor for the “new” year.

And CF = Control Factor = % additional control to be applied at this unit on or before the “new” year.

Units	OSD emissions	– pounds per ozone season day (sometimes expressed in tons per ozone season day)
	Growth Factor	– unitless this is a growth factor so units are pounds / pounds – hence unitless
	CF	– this term is expressed as percent additional removal from the base year

CF is calculated as follows

$$\text{CF} = \text{CE} \times \text{RP} \times \text{RE}$$

Where

CE is the control efficiency that is required for the emission category (e.g. Consumer Products)

RP is the Rule Penetration – the degree a given rule penetrates the universe of emission processes coming under the purview of the rule (taking into account rule applicability, exemptions, etc.)

RE is the Rule Efficiency – the correction factor to adjust for "real-world" operating conditions (i.e. equipment breakdowns, operator variance, compliance rate, etc.)

For each Area Source category, the equations above can be used with the data contained in Tables J-1 and J-2 below.

Note: The rows in the tables that contain 8 digit SCC codes are point source emissions and as noted in Section J-1, the reductions from 2002 to 2012 might not be consistent with the control factor because some facilities in the non-attainment area might already have controls.

Table F-1
Proposed Rules

Area Source Category	SCC	RE	RP	2012 CE	2002 act	2012 GF	2012 CF	2012 emiss	2002 OSD	2012 OSD
Adhesives and Sealants	2440020000	80	100	80.5	4601.22	1.499983	64.4	2457.02	12.64	6.75
	40200701	80	100	80.5	15715	1.559264	64.4	8723.36	0.04	0.06
	40200706	80	100	80.5	4259	1.559264	64.4	2364.16	0.02	0.03
	40200710	80	100	80.5	2664	1.559264	64.4	1478.78	0.01	0.01
Consumer Products (2)	2460000000	80	80	3.125	47498.5	1.040603	2	41560.29	130.49	114.18
Asphalt Paving	2461022000	80	80	31.25	1520.77	1.259831	20	1532.73	8.77	6.45
Portable Fuel Containers	2501011011	80	80	36.25	1043.52	1.040342	23.2	239.29	2.87	0.66
	2501011012	80	80	36.25	9011.19	1.040341	23.2	2066.34	24.76	5.68
	2501011016	80	80	36.25	494.55	1.040342	23.2	113.40	1.36	0.31
	2501012011	80	80	36.25	96.88	1.031107	23.2	22.02	0.27	0.06
	2501012012	80	80	36.25	793.01	1.031107	23.2	180.23	2.18	0.50
	2501012016	80	80	36.25	2052.83	1.031107	23.2	466.55	5.64	1.28
Portland Cement Plants	30501202	80	100	87.5	0	1.005944	70	0.00	0	0
	30501204	80	100	87.5	0	1.005944	70	0.00	0	0
	30501206	80	100	87.5	0	1.005944	70	0.00	0	0
	30500706	80	100	25	0	1.215827	20	0.00	0	0
	30500606	80	100	25	0	1.322385	20	0.00	0	0
Glass Manufacturing	30501416	80	100	87.5	0	1.185111	70	0.00	0	0
	30501401	80	100	87.5	0	1.185111	70	0.00	0	0
	30501403	80	100	87.5	0	1.185111	70	0.00	0	0
	30501402	80	100	87.5	0	1.185111	70	0.00	0	0
	39000689	80	100	87.5	0	1.081855	70	0.00	0	0
	39001399	80	100	25	0	1.176538	20	0.00	0	0
Asphalt Production	30500251	80	100	43.75	22200.9	1.346187	35	19426.27	0.02	0.03
	30500205	80	100	43.75	6786	1.346187	35	5937.90	0.002	0.003

Table F-2
Adopted Rules

Area Source Category	SCC	RE	RP	2012 CE	2002 act	2012 GF	2012 CF	2012 emiss	2002 OSD	2012 OSD
AIM Coatings	2401001000	80	80	48.4375	19672.49	1.277053	31	17334.74	70.26	61.91
	2401008000	80	80	48.4375	1314.15	0.984357	31	892.58	0.02	0.01
Consumer Products (1)	2460000000	80	80	22.1875	47498.5	1.040603	14.2	42408.45	130.49	114.18
Mobile Equipment Repair	2401005000	80	80	59.375	8784.76	1.212972	38	6606.51	33.79	25.41
Portable Fuel Containers	2501011011	80	100	89.125	1043.52	1.040342	71.3	311.57	2.87	0.66
	2501011012	80	100	89.125	9011.19	1.040341	71.3	2690.54	24.76	5.68
	2501011016	80	100	89.125	494.55	1.040342	71.3	147.66	1.36	0.31
	2501012011	80	100	89.125	96.88	1.031107	71.3	28.67	0.27	0.06
	2501012012	80	100	89.125	793.01	1.031107	71.3	234.67	2.18	0.50
	2501012016	80	100	89.125	2052.83	1.031107	71.3	607.49	5.64	1.28
Solvent Metal Cleaning	2415020000	80	100	82.5	87.22	1.339559	66	39.72	0.24	0.11
	2415025000	80	100	82.5	108.23	2.398751	66	88.27	0.30	0.24
	2415035000	80	100	82.5	44.32	1.342683	66	20.23	0.12	0.06
	2415045000	80	100	82.5	244.82	1.634302	66	136.04	0.67	0.37
	2415055000	80	100	82.5	1462.81	1.171966	66	582.88	4.02	1.60
	2415060000	80	100	82.5	776.13	1.240841	66	327.44	2.13	0.90