DEPARTMENT OF
ECOLOGY
State of Washington

Technical Support Document for Stationary and Portable Rock Crushing Operations

General Order of Approval No. 11-AQG-01

September 21, 2011

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1. SUMMARY

This General Order combines portable rock crushers with the stationary rock crushers. The old general orders remain in effect for rock crushers operating under a valid order for their sources. Any new rock crushers must comply with the requirements of this General Order.

2. PURPOSE OF GENERAL ORDER

On March 1, 2011, the Washington State Department of Ecology (Ecology) revised the General Regulation for Air Pollution Sources Chapter 173-400 Washington Administrative Code (WAC). There is a new section in the rule, Section 036 (Relocation of Portable Sources), which contains a number of relocation requirements. One of those requirements is that "A permitting authority in Washington State issued a notice of construction order of approval for the portable source after July 1, 2010, identifying the emission units as a portable source." This General Order of Approval not only combines the portable and stationary general orders, it satisfies the new requirements contained in WAC 173-400-036, and the requirements for issuing a General Order of Approval as discussed in WAC 173-400-560.

The six main elements of this Technical Support Document (TSD) are: (1) combining the portable and stationary general orders, (2) updates to the General Order to be consistent with the revised rule (Chapter 173-400 WAC), (3) revised Best Available Control Technology (BACT) review, (4) review of ambient impacts analysis, (5) review of approval conditions, and (6) editorial language updates to the Findings and Approval Conditions.

3. BACT

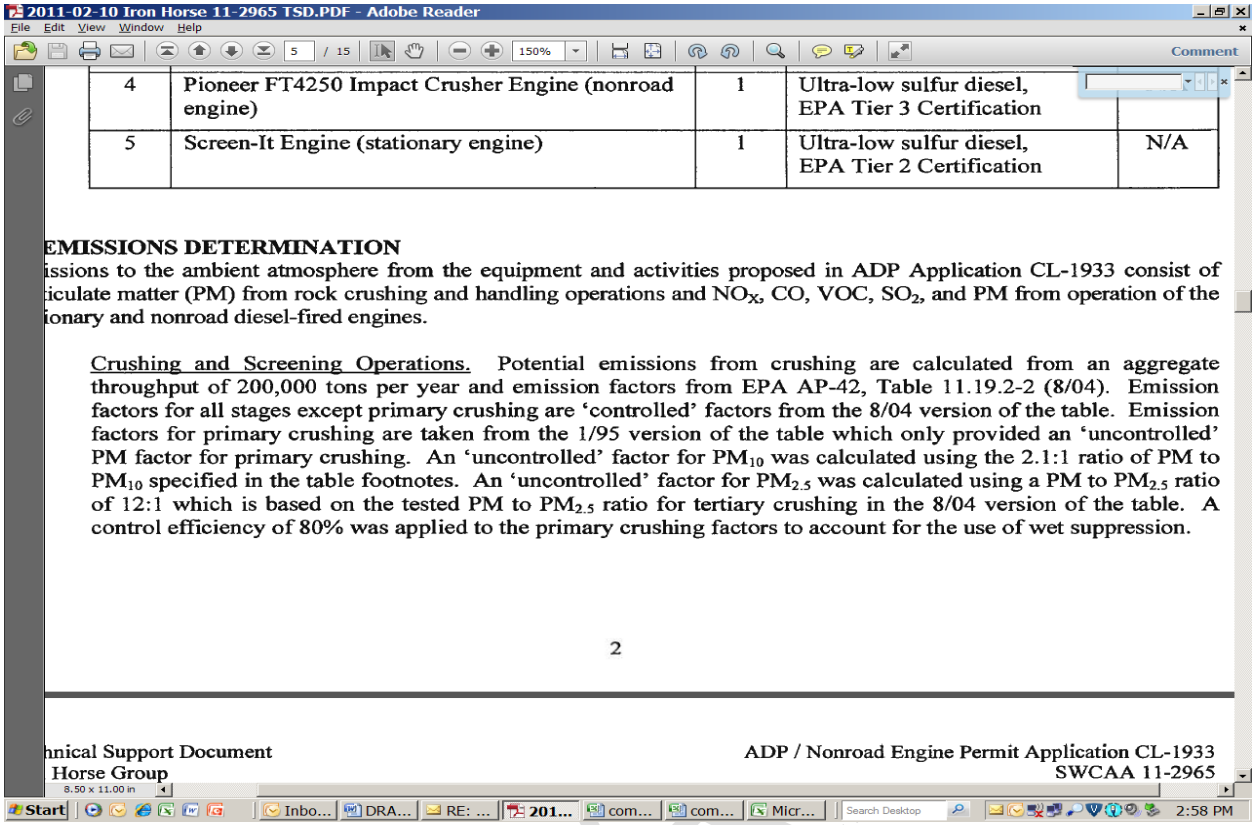
An inquiry was sent to all of the local air authorities in the state of Washington to verify current BACT for rock crushers. Replies were received from the Olympic Region Clean Air Agency (ORCAA), the Puget Sound Clean Air Agency (PSCAA), and the Southwest Clean Air Agency (SWCAA). Basically, 2011 BACT for portable rock crushers is the same as 2006 BACT. The pollutants of concern are particulate matter (PM) Also Known As (AKA) total suspended particulate (TSP), PM smaller than 10 microns in diameter (PM_{10}), and PM smaller than 2.5 in diameter ($PM_{2.5}$).

Table 1 below is a comparison of the emission factors considered for this general order.

Table 1. Emission Factors Comparison

Activity	Pollutant	Emission Factor Selected	ORCAA	SWCAA	SWCAA 2011	SCAPCA (2006)	AP-42 TBL 11.19.2-2 (8/04)	AP-42 (7/95)
		controlled	controlled	controlled	controlled	controlled	controlled	controlled
		(lb/ton)	(lb/ton)	(lb/ton)	(lb/ton)	(lb/ton)	(lb/ton)	(lb/ton)
Screening	PM	0.0022	0.008	0.032	0.0022	0.00087	0.0022	NI
	PM10	0.00074	NI	0.015	0.00074	NI	0.00074	0.00084
	PM2.5	0.00005	NI	NI	0.00005	NI	0.00005	NI
Fines	PM	0.0036	NI	NI	NI	NI	0.0036	NI
screening	PM10	0.0022	NI	NI	NI	NI	0.0022	NI
	PM2.5	ND	NI	NI	NI	NI	ND	NI
Product	PM	0.00014	4.8E-05	0.003	NI	0.0011	0.00014	NI
Transfer	PM10	0.000046	NI	0.0014	NI	NI	0.000046	0.000048
	PM2.5	0.000013	NI	NI	NI	NI	0.000013	NI
Primary	PM	0.0012	0.0007	NI	0.00014	NI	ND	NI
Crusher	PM10	0.00054	NI	NI	0.000067	0.0024	ND	NI
	PM2.5	ND	NI	NI	0.000012	NI	ND	NI
Secondary	PM	0.0012	0.0007	0.005	0.0012	NI	ND	NI
Crusher	PM10	0.00054	NI	0.0024	0.00054	0.0024	ND	NI
	PM2.5	ND	NI	NI	0.0001	NI	ND	NI
Tertiary	PM	0.0012	NI	NI	0.0012	NI	0.0012	NI
Crusher	PM10	0.00054	NI	NI	0.00054	0.0024	0.00054	0.00059
	PM2.5	0.0001	NI	NI	0.0001	NI	NI	NI
Truck	PM	NI	0.0001	0.003	0.00014	NI	NI	NI
Loading	PM10	0.000016	NI	0.0014	0.000046	0.000761	0.000016	NI
	PM2.5	NI	NI	NI	0.000013	NI	NI	NI
NI=no information ND=non detect								

Several of the emission factors from the SWCAA permits were different from those selected as BACT for this General Order. SWCAA's emission factors for particulate from the primary and secondary crushers were up to an order of magnitude lower than the emission factors used by Ecology. It is logical that emissions of PM AKA TSP and PM_{10} would be greater when crushing smaller aggregate. Ecology could not verify this assumption, so we chose to be conservative and use the larger emission factors presented for primary, secondary, and tertiary crushing. The development of the SWCAA emission factors was based upon the following statement in the SWCAA background document:



2011-02-10 Iron Horse 11-2965 TSD.PDF - Adobe Reader

4	Pioneer FT4250 Impact Crusher Engine (nonroad engine)	1	Ultra-low sulfur diesel, EPA Tier 3 Certification	
5	Screen-It Engine (stationary engine)	1	Ultra-low sulfur diesel, EPA Tier 2 Certification	N/A

EMISSIONS DETERMINATION

issions to the ambient atmosphere from the equipment and activities proposed in ADP Application CL-1933 consist of iculate matter (PM) from rock crushing and handling operations and NO_X, CO, VOC, SO_2, and PM from operation of the ionary and nonroad diesel-fired engines.

Crushing and Screening Operations. Potential emissions from crushing are calculated from an aggregate throughput of 200,000 tons per year and emission factors from EPA AP-42, Table 11.19.2-2 (8/04). Emission factors for all stages except primary crushing are 'controlled' factors from the 8/04 version of the table. Emission factors for primary crushing are taken from the 1/95 version of the table which only provided an 'uncontrolled' PM factor for primary crushing. An 'uncontrolled' factor for PM_{10} was calculated using the 2.1:1 ratio of PM to PM_{10} specified in the table footnotes. An 'uncontrolled' factor for $PM_{2.5}$ was calculated using a PM to $PM_{2.5}$ ratio of 12:1 which is based on the tested PM to $PM_{2.5}$ ratio for tertiary crushing in the 8/04 version of the table. A control efficiency of 80% was applied to the primary crushing factors to account for the use of wet suppression.

2

hnical Support Document — ADP / Nonroad Engine Permit Application CL-1933
Horse Group — SWCAA 11-2965

All of the portable rock crusher permits reviewed required the use of wet suppression to achieve the controlled emission factors. BACT for controlling emissions of PM(AKA TSP)/PM_{10}/$PM_{2.5}$ from portable rock crushing operations has been selected to be wet suppression control technology, which is essentially water spray nozzles or fog bars that result in reduced emissions of particulate matter.

At each one of these transfer points, screening operation or crushing operation opacity will be limited to 10 percent, or less, when measured by 40 CFR 60 Appendix A, Method 9.

For haul roads, BACT has been selected to be Best Management Practices in accordance with the elements in the Fugitive Dust Control Plan (FDCP). Effort should be taken to limit the amount of visible emissions leaving the site. Emissions of opacity from haul roads should be minimized to reduce the impact of the haul road on the properties adjacent to the site. Ecology is not requiring the source to monitor haul road emissions using EPA Method 9. Rather, we believe that the source can "self-monitor" and follow the requirements outlined in the FDCP. Not following the FDCP may be a justification for enforcement by the appropriate regional office. The attached FDCP includes elements such as watering access roads.

Please note that this BACT determination is identical to the BACT determination included in the June 8, 2006, TSD with the exception that $PM_{2.5}$ has now been identified as a pollutant of concern.

4. REVIEW OF EXISTING APPROVAL CONDITIONS

The original stationary and portable rock crusher general orders were used as a template for creating this combined general order. We changed the appearance and layout of the General Order of Approval to be consistent with current practices. Changes to the Findings section are intended to aid the permittee in understanding the General Order of Approval. They are not enforceable as a practicable matter.

Specifically, the following changes have been made:

Revise the Findings section to be consistent with current permitting practices. This includes:

a) A new header.

b) Removal of registration requirement. A source still must register even though it is no longer discussed in the Findings section of the General Order.

c) Identification of pollutants of concern removed and placed in the TSD.

d) BACT discussion removed and placed in the TSD.

e) Emission estimates removed and placed in the TSD.

f) A statement about operation of up to a year has been added.

g) A discussion about nonroad engines has been added.

h) A discussion about the process to gain coverage under the General Order has been clarified.

Revise the Approval Conditions section to be consistent with current permitting practices. This includes:

a) The language in old Approval Condition 1 has been updated. The maximum annual production has been reduced from 1.5 million tons of material per year to one million tons per year.

b) The requirement to follow the FDCP has been relocated to Approval Condition 1.

c) A discussion about locating longer than one year has been inserted into Approval Condition 1.

d) The distance to the property line has been relocated to Approval Condition 1.

e) Additional Restrictions for Operation of a Stationary Rock Crusher section has been added.

f) Additional Restrictions for Operation of a Portable Rock Crusher section has been added.

g) Old Approval Condition 3 requires a portable rock crusher to be located in a county under the jurisdiction of Ecology. That approval condition has been removed so that this

General Order could be used in other areas of the state as part of portable source relocation allowed in WAC 173-400-036.

h) The language associated with the O&M manual has been updated.

i) General conditions have been updated to be consistent with current permitting practices.

j) Several editorial changes such as changing "shall" to "must" have been made to the document.

k) The FDCP has been updated.

5. EMISSIONS

In the 2006 analysis, Ecology was not required to evaluate $PM_{2.5}$. For this General Order, Ecology quantified and evaluated emissions of PM AKA TSP, PM_{10}, and $PM_{2.5}$. The emissions presented below were calculated from a rock crusher consisting of four transfer points, four screens, a primary crusher, a secondary crusher, a tertiary crusher, truck loading, and unpaved roads. Some of the emission units are classified as fugitive but were quantified for this analysis. The following table presents the maximum allowable emissions under this General Order:

Table 2. Maximum Allowable Emissions

Emission Unit	PM AKA TSP		PM_{10}		$PM_{2.5}$	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Transfer Points	0.1231	0.1026	0.0405	0.0337	0.0114	0.0095
Screens	1.9583	1.6319	0.6754	0.5628	0.0439	0.0366
Crushers	0.3353	0.2794	0.1509	0.1257	0.0053	0.0279
Truck Loading	N/A	N/A	0.0096	0.0080	N/A	N/A
Unpaved Roads	7.6	6.1320	2.0	1.7520	N/A	N/A
Total	**3.82**	**8.15**	**2.88**	**2.48**	**0.06**	**0.07**

Emissions are presented in terms of pounds per hour (lb/hr) and tons per year (tpy). The estimates are based upon the limits contained in the General Order. For lb/hr, the emissions are based upon 14,400 tons of material processed in a day. For tpy, the emissions are based upon the facility processing 1,000,000 tons of material in a year.

6. NSPS/NESHAP/MACT

This general order of approval complies with all New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAPs), and Maximum Achievable Control Technology (MACT) requirements.

7. AMBIENT IMPACT ANALYSIS

A screening air dispersion model (BEE-Line AerScreen 2.00) was used to evaluate the impacts against the Ambient Air Quality Standards (AAQS). The model shows that there is no state or federal AAQS exceeded. The fugitive emissions associated with the haul road were not included in the analysis as allowed by the October 27, 2009 guidance (see Appendix E of this TSD).

Pages 16-18 of this TSD are a copy of the excel spreadsheets used to evaluate AAQS standards. The AAQS are shown in Table 3.

Table 3. AAQS

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)
PM (AKA TSP)	Annual	-	60
	24-hr	-	150
PM_{10}	Annual	-	50
	24-hr	150	150
$PM_{2.5}$	Annual	15	-
	24-hr	35	-

Table 4 is the calculated background for Washington State.

Table 4. Background

Pollutant	Averaging Time	Background ($\mu g/m^3$)
PM (AKA TSP)	Annual	20
	24-hr	60
PM_{10}	Annual	7
	24-hr	24
$PM_{2.5}$	Annual	13
	24-hr	28

Table 5 is the highest modeled ambient concentrations at the fence line plus background compared to the AAQS.

Table 5. AAQS Analysis

Pollutant	Averaging Time	Emissions ($\mu g/m^3$)	AAQS ($\mu g/m^3$)
PM (AKA TSP)	Annual	25.71	60
	24-hr	94.27	150
PM_{10}	Annual	15.05	50
	24-hr	40.29	150
$PM_{2.5}$	Annual	7.20	15
	24-hr	21.20	35

8. CONCLUSION

Ecology's Air Quality Program finds that this evaluation meets all the requirements of New Source Review.

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9. ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standard
AKA	Also Known As
BACT	Best Available Control Technology
Ecology	Washington State Department of Ecology
FDCP	Fugitive Dust Control Plan
lb/hr	Pound(s) per hour
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NSPS	New Source Performance Standards
ORCAA	Olympic Region Clean Air Agency
PM	Particulate matter also known as total suspended particulate
PM_{10}	PM smaller than 10 microns in diameter
$PM_{2.5}$	PM smaller than 2.5 microns in diameter
PSCAA	Puget Sound Clean Air Agency
SWCAA	Southwest Clean Air Agency
tpy	Tons per year
TSD	Technical Support Document
TSP	Total Suspended Particulate also known as PM
WAAQS	Washington Ambient Air Quality Standard
WAC	Washington Administrative Code

APPENDIX A. EMISSIONS CALCULATION

Rock Crusher numbers
Tons of Material per year
1,000,000

AP42 Section 11.19 2-2
6/7/2011

Activity	Pollutant	Tons of Material	Uncontrolled (lb/ton)	Controlled (lb/ton)	Uncontrolled (lb/hr)	Controlled (lb/hr)
Product Transfer	$PM_{2.5}$	1,000,000	N/A	0.000013	N/A	0.001484
	PM	1,000,000	0.003	0.00014	0.342465753	0.015982
	PM_{10}	1,000,000	0.0011	0.000046	0.125570776	0.005251
Screening	$PM_{2.5}$	1,000,000	N/A	0.00005	N/A	0.005708
	PM	1,000,000	0.025	0.0022	2.853881279	0.251142
	PM_{10}	1,000,000	0.0087	0.00074	0.993150685	0.084475
Primary Crusher	$PM_{2.5}$	250000	N/A	0.0001	N/A	0.002854
	PM	250000	0.0054	0.0012	0.154109589	0.034247
	PM_{10}	250000	0.0024	0.00054	0.068493151	0.015411
Screening	$PM_{2.5}$	250000	N/A	0.00005	N/A	0.001427
	PM	250000	0.025	0.0022	0.71347032	0.062785
	PM_{10}	250000	0.0087	0.00074	0.248287671	0.021119
Product Transfer	$PM_{2.5}$	250000	N/A	0.000013	N/A	0.000371
	PM	250000	0.003	0.00014	0.085616438	0.003995
	PM_{10}	250000	0.0011	0.000046	0.031392694	0.001313
Secondary Crusher	$PM_{2.5}$	187500	N/A	0.0001	N/A	0.002140
	PM	187500	0.0054	0.0012	0.115582192	0.025685
	PM_{10}	187500	0.0024	0.00054	0.051369863	0.011558
Screening	$PM_{2.5}$	187500	N/A	0.00005	N/A	0.001070
	PM	187500	0.025	0.0022	0.53510274	0.047089
	PM_{10}	187500	0.0087	0.00074	0.186215753	0.015839
Product Transfer	$PM_{2.5}$	187500	N/A	0.000013	N/A	0.000278
	PM	187500	0.003	0.00014	0.064212329	0.002997
	PM_{10}	187500	0.0011	0.000046	0.023544521	0.000985
Tertiary Crusher	$PM_{2.5}$	28125	N/A	0.0001	N/A	0.000321
	PM	28125	0.0054	0.0012	0.017337329	0.003853
	PM_{10}	28125	0.0024	0.00054	0.007705479	0.001734
Fines screening	$PM_{2.5}$	28125	N/A	N/A	N/A	N/A
	PM	28125	0.3	0.0036	0.963184932	0.011558
	PM_{10}	28125	0.072	0.0022	0.231164384	0.007063
Product	$PM_{2.5}$	28125	N/A	0.000013	N/A	0.000042
	PM	28125	0.003	0.00014	0.009631849	0.000449

Transfer	PM_{10}	28125	0.0011	0.000046	0.003531678	0.000148
Truck Loading	$PM_{2.5}$	1000000	N/A	N/A	N/A	N/A
	PM	1000000	N/A	N/A	N/A	N/A
	PM_{10}	1000000	0.000016	N/A	N/A	0.00182648
Unpaved Roads	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A
	PM	N/A	N/A	N/A	N/A	1.4
	PM_{10}	N/A	N/A	N/A	N/A	0.4
TOTAL			PM	lb/hr	5.85	1.86
			PM_{10}	lb/hr	1.97	0.57
			$PM_{2.5}$	lb/hr	N/A	0.02
			PM	ton/yr	2.52	8.15
			PM_{10}	ton/yr	8.64	2.48
			$PM_{2.5}$	ton/yr	N/A	0.07

APPENDIX B. UNPAVED ROADS CALCULATIONS

			Unpaved Roads			PM^{10}		
Source		AP-42 13.2.2-1		by Rich Hibbard		6/7/2011		
		December 2003						
$E=k(s/12)^a(W/3)^b$								
E= emissions in lb/Vehicle Miles Traveled (VMT)								
k= constant, for industrial roads					1.5	PM^{10}		
s= surface material silt content					4.8			
a= constant for industrial roads					0.9	PM^{10}		
W= mean vehicle weight (tons)			loaded	80000	lbs	unloaded	40000	lbs
b= constant for industrial roads					0.45	PM^{10}		
$E\ (PM^{10})$		1.853298	pounds per vehical mile travled					
			Note: this assumes that half of the time the truck is loaded					
Assumptions:								
weight of soil		2.05	tons/cubic yard					
1 Truck		10	cubic yards					
length of haul road		1/4mile	1/8 mile loaded and 1/8 mile un-loaded					
Water control		85%	effective					
Tons of material processed			Pounds of PM10 per year		Tons of PM10 per year		# trucks/hr	lb/hr
4000000			13,561		6.8		22.3	1.5
3000000			10,171		5.1		16.7	1.2
2000000			6,780		3.4		11.1	0.8
1500000			5,085		2.5		8.4	0.6
1000000			3,390		1.7		5.6	0.4
14400			N/A		N/A		29.3	2.0

			Unpaved Roads			PM		
Source		AP-42 13.2.2-1		by Rich Hibbard		6/7/2011		
		December 2003						
$E=k(s/12)^a(W/3)^b$								
E= emissions in lb/Vehicle Miles Traveled (VMT)								
k= constant, for industrial roads					4.9	PM		
s= surface material silt content					4.8			
a= constant for industrial roads					0.7	PM		
W= mean vehicle weight (tons)			loaded	80000	lbs	unloaded	40000	lbs
b= constant for industrial roads					0.45	PM		
E (PM)		7.271736	pounds per vehical mile travled					
			Note: this assumes that half of the time the truck is loaded					
Assumptions:								
weight of soil		2.15	tons/cubic yard					
1 Truck		10	cubic yards					
length of haul road		1/4mile	1/8 mile loaded and 1/8 mile un-loaded					
Water control		85%	effective					
Tons of material processed			Pounds of		Tons of		# trucks/hr	lb/hr
			PM per year		PM per year			
4000000			50,733		25.4		21.2	5.8
3000000			38,050		19.0		15.9	4.3
2000000			25,367		12.7		10.6	2.9
1500000			19,025		9.5		8.0	2.2
1000000			12,683		6.3		5.3	1.4
14400			N/A		N/A		27.9	7.6

APPENDIX C. AERSCREEN RESULTS

AERSCREEN 11126 / AERMOD 1110 06/07/11
11:03:22

TITLE: VOLUME RC 6-7-11

********** VOLUME PARAMETERS **********

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
VOLUME HEIGHT: 5.00 meters 16.40 feet
INITIAL LATERAL DIMENSION: 25.00 meters 82.02 feet
INITIAL VERTICAL DIMENSION: 10.00 meters 32.81 feet
RURAL OR URBAN: RURAL

FLAGPOLE RECEPTOR HEIGHT: 1.40 meters 4.59 feet

INITIAL PROBE DISTANCE = 1000. meters 3281. feet

********** BUILDING DOWNWASH PARAMETERS **********

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

********** PROBE ANALYSIS **********
25 meter receptor spacing: 55. meters - 1000. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	0.300	1454.	54.8	ANN

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 255.4 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: USER ENTERED

ALBEDO: 0.20
BOWEN RATIO: 2.00
ROUGHNESS LENGTH: 0.300 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	02	06	6	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-2.51	0.057	-9.000	0.020	-999.	31.	5.8	0.300	2.00	0.20	1.00

HT	REF TA	HT
10.0	255.4	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	02	06	6	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS

-2.51 0.057 -9.000 0.020 -999. 31. 5.8 0.300 2.00 0.20 1.00

HT REF TA HT
- - - - - - - - - - -
10.0 255.4 2.0

********** AERSCREEN AUTOMATED DISTANCES **********

OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
54.75	1454.	550.00	377.1
75.00	1322.	575.00	364.2
100.00	1190.	600.00	352.1
125.00	1080.	625.00	340.7
150.00	985.8	650.00	330.0
175.00	904.9	675.00	319.9
200.00	834.6	700.00	310.4
225.00	773.0	725.00	301.4
250.00	718.7	750.00	292.8
275.00	670.6	775.00	284.7
300.00	627.7	800.00	277.0
325.00	589.3	825.00	269.7
350.00	554.7	850.00	262.7
375.00	523.4	875.00	256.1
400.00	495.0	900.00	249.7
425.00	469.1	925.00	243.6
450.00	445.4	950.00	237.8
475.00	423.6	975.00	232.2
500.00	405.8	1000.00	226.9
525.00	391.0		

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	1454.	1454.	1308.	872.2	145.4

DISTANCE FROM SOURCE 54.75 meters

IMPACT AT THE AMBIENT BOUNDARY	1454.	1454.	1308.	872.2	145.4

DISTANCE FROM SOURCE 54.75 meters

APPENDIX D. NAAQS ANALYSIS

Tons of Material per year 1000000

6/9/11

Activity	Pollutant	Tons of material	uncontroled (lb/ton)	controled (lb/ton)	PM2.5 controled (lb/ton)	uncontrole lb/hr	controled lb/hr	PM2.5 controled lb/hr
Product	PM	1,000,000	0.003	0.00014	1.3E-05	0.342466	0.015982	0.001484
Transfer	PM10	1000000	0.0011	0.000046		0.125571	0.005251	
Screening	PM	1000000	0.025	0.0022	0.00005	2.853881	0.251142	0.005708
	PM10	1000000	0.0087	0.00074		0.993151	0.084475	
Primary	PM	250000	0.0054	0.0012	0.0001	0.15411	0.034247	0.002854
Crusher	PM10	250000	0.0024	0.00054		0.068493	0.015411	
Screening	PM	250000	0.025	0.0022	0.00005	0.71347	0.062785	0.001427
	PM10	250000	0.0087	0.00074		0.248288	0.021119	
Product	PM	250000	0.003	0.00014	1.3E-05	0.085616	0.003995	0.000371
Transfer	PM10	250000	0.0011	0.000046		0.031393	0.001313	
Secondary	PM	187500	0.0054	0.0012	0.0001	0.115582	0.025685	0.00214
Crusher	PM10	187500	0.0024	0.00054		0.05137	0.011558	
Screening	PM	187500	0.025	0.0022	0.00005	0.535103	0.047089	0.00107
	PM10	187500	0.0087	0.00074		0.186216	0.015839	
Product	PM	187500	0.003	0.00014	1.3E-05	0.064212	0.002997	0.000278
Transfer	PM10	187500	0.0011	0.000046		0.023545	0.000985	
Trtiary	PM	28125	0.0054	0.0012	0.0001	0.017337	0.003853	0.000321
Crusher	PM10	28125	0.0024	0.00054		0.007705	0.001734	
Fines	PM	28125	0.3	0.0036		0.963185	0.011558	
screening	PM10	28125	0.072	0.0022	0	0.231164	0.007063	
Product	PM	28125	0.003	0.00014	1.3E-05	0.009632	0.000449	4.17E-05
Transfer	PM10	28125	0.0011	0.000046		0.003532	0.000148	
Truck	PM	1000000	0.0001			0.011416	0	
Loading	PM10	1000000				0	0	
Unpaved	PM						1.4	
Roads	PM10						0.4	
				PM	lb/hr	5.86601	0.459782	
				PM10	lb/hr	1.970427	0.164895	
				PM2.5	lb/hr			0.015695
				PM	ton/yr	25.69313	2.013844	
				PM10	ton/yr	8.630469	0.722241	
				PM2.5	ton/yr			0.068745
				PM	g/sec	0.739117	0.057932	
				PM10	g/sec	0.248274	0.020777	
				PM2.5	g/sec			0.001991
Fugitive Road emissions excluded per October 27, 2009 guidance								
				road PM	g/sec	0	0	
				road PM10	g/sec	0	0	
			TOTAL	PM	g/sec		0.057932	
				PM10	g/sec		0.020777	
				PM2.5	g/sec			0.001991

Rock Crusher pm

NAAQS=150 24-hr, 60 annual

distance	Unitless output ug/MEE3	uncontroled 0.057932 ug/MEE3 1 hr ave	24-hr ave	Annual ave	NAAQS 24-hr NAA	Annual NAAQS
55.00	1454.00	84.23	50.54	8.42	110.54	28.42
75.00	1322.00	76.59	45.95	7.66	105.95	27.66
100.00	1190.00	68.94	41.36	6.89	101.36	26.89
150.00	985.80	57.11	34.27	5.71	94.27	25.71
200.00	834.60	48.35	29.01	4.84	89.01	24.84
250.00	718.70	41.64	24.98	4.16	84.98	24.16
300.00	627.70	36.36	21.82	3.64	81.82	23.64
350.00	554.70	32.13	19.28	3.21	79.28	23.21
400.00	495.00	28.68	17.21	2.87	77.21	22.87
450.00	445.40	25.80	15.48	2.58	75.48	22.58
500.00	405.80	23.51	14.11	2.35	74.11	22.35

Rock Crusher pm2.5

NAAQS=35 24-hr, 15 annual

distance	Unitless output ug/MEE3	uncontroled 0.001991 ug/MEE3 1 hr ave	24-hr ave	Annual ave	24-NAAQS	annual-NAAQS
55.00	1454.00	2.89	1.73	0.29	21.29	7.29
75.00	1322.00	2.63	1.58	0.26	21.26	7.26
100.00	1190.00	2.37	1.42	0.24	21.24	7.24
150.00	985.80	1.96	1.18	0.20	21.20	7.20
200.00	834.60	1.66	1.00	0.17	21.17	7.17
250.00	718.70	1.43	0.86	0.14	21.14	7.14
300.00	627.70	1.25	0.75	0.13	21.13	7.13
350.00	554.70	1.10	0.66	0.11	21.11	7.11
400.00	495.00	0.99	0.59	0.10	21.10	7.10
450.00	445.40	0.89	0.53	0.09	21.09	7.09
500.00	405.80	0.81	0.49	0.08	21.08	7.08

Rock Crusher pm10

NAAQS=150 24-hr, annual 50

distance	Unitless output ug/MEE3	uncontroled 0.020777 ug/MEE3 1 hr ave	24-hr ave	Annual ave	24-hr NAAQS	annual NAAQS
55.00	1454.00	30.21	18.13	3.02	46.13	16.02
75.00	1322.00	27.47	16.48	2.75	44.48	15.75
100.00	1190.00	24.72	14.83	2.47	42.83	15.47
150.00	985.80	20.48	12.29	2.05	40.29	15.05
200.00	834.60	17.34	10.40	1.73	38.40	14.73
250.00	718.70	14.93	8.96	1.49	36.96	14.49
300.00	627.70	13.04	7.82	1.30	35.82	14.30
350.00	554.70	11.53	6.92	1.15	34.92	14.15
400.00	495.00	10.28	6.17	1.03	34.17	14.03
450.00	445.40	9.25	5.55	0.93	33.55	13.93
500.00	405.80	8.43	5.06	0.84	33.06	13.84

APPENDIX E. FUGITIVE EMISSIONS GUIDANCE

MEMORANDUM

TO: Air Quality Program Commercial and Industrial Permitting Staff

FROM: Commercial and Industrial Steering Committee

RE: Guidance on Evaluating Fugitive Emissions on NSR for Projects subject to Chapters 173-400 and 460 WAC's.

DATE: October 27, 2009

Purpose

The purpose of this guidance is to clarify the steps that should be considered when evaluating fugitive emissions from projects subject to NSR in counties regulated by the Department of Ecology.

Background

Quantifying and modeling fugitive emissions of criteria and toxic air pollutants is quite complicated. This guidance does not change Ecology's current practice of quantifying fugitive emissions. What it does is add a step to verify the fugitive problem by including a peer review of the emission factors prior to permitting a project where any standards or trigger levels are exceeded.

Guidance:

Fugitive emissions for NSR actions will be processed as follows:

- Increases of fugitive emissions from toxic as well as criteria pollutant sources will be quantified as part of NSR.
- Increases of fugitive emissions will be modeled to determine their contribution as part of the ambient impact analysis.
- If increases of fugitive emissions appear to cause or contribute to a NAAQS exceedance or ASIL exceedance from modeling, a peer review by the Commercial/Industrial Work Group engineers will occur prior to including fugitive emissions in the NSR action.

Detail:

In performing the quantification step a preference shall be given to standard emission factors. If new or non-standard emission factors are used, this information should be peer reviewed by the Commercial/Industrial Work Group engineers.

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