

**Western North Carolina Regional Air Quality Agency
APPLICATION REVIEW SUMMARY**

SECTION A: FACILITY INFORMATION			
COMPANY NAME:	Blue Ridge Concrete, Inc.		
SITE NAME:	Blue Ridge Concrete, Inc.		
MAILING ADDRESS:	PO Box 2594, Weaverville, NC 28787		
SITE ADDRESS:	50 Murphy Hill Road, Weaverville, NC		
GENERAL DESCRIPTION OF BUSINESS:	Ready Mix Concrete Manufacturer		
FACILITY CLASSIFICATION:	Small	SITE STATUS:	New

SECTION B: APPLICATION INFORMATION			
DATE OF APPLICATION:	3/3/10	APPLICATION TRACKING NO.:	NA
DATE COMPLETE APPLICATION RECEIVED:	3/3/10	BOARD MEETING DATE:	TBD
CONFIDENTIALITY REQUESTED?	No	BOARD AGENDA TYPE:	Construct and Operate
APPLICATION RESULTS:	The purpose of this review is to lend approval for the WNCRAQA to allow construction and operation of the facility.		
PERMIT NO. / DATE ISSUED BY APPLICATION:	11-881-10/TBD		
PERMIT NO. / DATE VOIDED BY APPLICATION:	N/A		

SECTION C: REGULATORY INFORMATION	
WNCRAQA REGULATIONS:	WNCRAQA Code 4.0515, 4.0521, 4.0540, 17.0700

SECTION D: FACILITY-WIDE EMISSIONS INFORMATION		
POLLUTANTS REVIEWED AS A RESULT OF THIS APPLICATION OR WNCRAQA ACTION:	Actual Emissions (TONS/YR)	Potential Emissions (TONS/YR)
PM	0.666*	10.602*
PM-10	0.306*	4.872*
PM-2.5	0.306*	4.872*
SO ₂	--	--
NO _x	--	--
CO	--	--
VOC	--	--
All Hazardous Air Pollutants (HAPs)	0.00021*	0.00331*
List all HAPs >10TPY of potential emissions	None	

Emission numbers denoted with an () reflect "controlled" emissions (i.e. emissions reduced by a pollution control device).

IN COMPLIANCE WITH EMISSION STANDARDS / RECOMMEND APPROVAL			
Engineer Name:	James C. Raiford/ <i>James C. Raiford</i>	Date Completed:	4/11/10
Reviewer Name:	Vic Fahrer/ <i>Vic Fahrer</i>	Date Approved:	4/19/10
Supervisor Name:	Ashley Featherstone/ <i>Ashley Featherstone</i>	Date Approved:	4/16/10
Director Name:	David Brigman/ <i>David Brigman</i>	Date Approved:	4/19/10

SECTION A DETAILS

FACILITY INFORMATION

[Detailed discussion of any items in Section A]

Blue Ridge Concrete, Inc. is a ready mix concrete batching process with a maximum rated capacity of 60 cubic yards per hour. Sand, gravel, cement, and water are gravity fed from a weigh hopper into mixer trucks. The concrete is mixed in the trucks on the way to the job site where it is poured. Particulate matter emission points include the cement silo, the flyash silo, the weigh hopper, truck load out, storage piles, and haul roads.

Particulate matter emissions from the storage silos, the weigh hopper, and the truck load out are controlled by bagfilters. Emissions from storage piles and haul roads are typically controlled by wet suppression.

SECTION B DETAILS

APPLICATION INFORMATION

[List all emission sources (permitted and exempt) reviewed as a result of this application, their associated control devices and pollutants. Provide a detailed discussion of any other items in Section B at bottom under "Application Notes"]

EMISSION SOURCE ID	EMISSION SOURCE DESCRIPTION 1. Type, manufacturer, capacity 2. Control device with ID (if any)	POLLUTANT(S) EMITTED	MISCELLANEOUS NOTES
CBP	One (1) concrete batch plant with a maximum rated capacity of 60 yards ³ /hour	PM, PM-10, PM-2.5, HAPS/TAPS	CBP is a Erie Strayer Company Mobile Combo Gravity Transit Plant Mix that consists of the equipment specified below
ES-1	One (1) 74 cubic yard capacity cement silo with emissions controlled by a baghouse (CD-1).	PM, PM-10, PM-2.5, HAPS/TAPS	CD-1 is a C&W Manufacturing Dust Collector, SK-250-436, with 250 total square feet of filter area. Listed on the permit application as ES-7.
ES-2	One (1) 74 cubic yard capacity flyash silo with emissions controlled by a baghouse (CD-2).	PM, PM-10, PM-2.5, HAPS/TAPS	CD-2 is a C&W Manufacturing Dust Collector, SK-250-436, with 250 total square feet of filter area. Listed on the permit application as ES-8.
ES-3	One (1) weigh hopper with emissions controlled by a baghouse (CD-3).	PM, PM-10, PM-2.5, HAPS/TAPS	CD-3 is a Belgrade Steel Tank Company bag filter with 16 total square feet of filter area. Listed on the permit application as ES-9.
ES-4	One (1) truck mix operation with emissions controlled by a baghouse (CD-4).	PM, PM-10, PM-2.5, HAPS/TAPS	CD-4 is a C&W Manufacturing Dust Collector, RA-140, with 1433 total square feet of filter area. Listed on the permit application as ES-10.
	Aggregate, sand, conveyors, etc.	PM, PM-10, PM-2.5	Fugitive emission points. They will not be listed on the permit but are subject to the fugitive dust rule (WNCRAQA Code 4.0540). These are listed on the permit application form as ES-1 through ES-6.

APPLICATION NOTES

The application was submitted on March 3, 2010. Included with the application was a zoning consistency letter from Buncombe County.

This permit has been limited to an annual production of 33,000 cubic yards of ready mix concrete to demonstrate compliance with NC Toxics.

Bagfilter evaluations were performed for each bagfilter. The bagfilter efficiency calculations were derived using the particle distribution numbers that were submitted with the application. The Agency also contacted the manufacturers of the bagfilters and confirmed that all the bagfilters in use are felted. The bagfilter efficiency for each bagfilter was rated at 99.78 percent. This is 0.12 percent lower than the estimated efficiency from the application. According to WNCRAQA Code 4.0515, the allowable emission rate for particulates is well above the calculated emission rate of the concrete batch plant when controls are used, and is also higher than the calculated emission rate when no controls are used. The very small percentage difference in the efficiency calculations will not cause Blue Ridge Concrete to exceed their allowable rate. See Section C of this Permit Review for more information on the allowable emission rate.

SECTION C DETAILS

REGULATORY INFORMATION

(Identify the WNCRAQA Regulations reviewed because of this application. At a minimum, the regulations already listed should be reviewed and reason given for applicability or non-applicability. If a regulation has a standard, list the standard and indicate how the source is in compliance.)

WNCRAQA REGULATION NUMBER / TITLE	EMISSION SOURCE ID NO(S). SUBJECT	NOTES ON REGULATION (Compliance demonstration, applicability, etc.)
17.0500 – Title V Procedures	NA	The facility does not have potential emissions above the threshold of 100 tons/year for any criteria pollutant, 25 tons/year for any combination of hazardous air pollutants, or 10 tons/year for any individual hazardous air pollutant.
17.0700 – Toxic Air Pollutant Procedures	CBP	The operation of this facility does trigger a toxics review. Total yearly output is restricted to 33,000 cubic yards per year to maintain emissions below the TPER for arsenic. This limit is a condition of the permit. By taking a limit and maintaining emissions below the TPER, the facility is not required to perform air dispersion modeling.
4.0524 – New Source Performance Standards	NA	The facility is not subject to NSPS.
4.0530 – Prevention of Significant Deterioration	NA	The facility does not have potential emissions above the threshold of 250 tons/year for any criteria pollutant, nor is it one of the 28 source categories that have an applicability threshold of 100 tons per year for any criteria pollutant.
4.1111 – MACT (40 CFR 63)	NA	The facility has no equipment or processes that are subject to a MACT standard.
4.0515 – Particulates from Miscellaneous Industrial Processes	CBP	<p>The allowable emission rates are a function of the process weight rate and shall be determined by the following equation, where P is the process throughput rate in tons per hour (tons/hr) and E is the allowable emission rate in pounds per hour (lbs/hr). $E = 4.10 * (P)^{0.67}$ for $P < 30$ tons/hr. For process weight rates greater than 60,000 pounds per hour, the allowable emission rates for particulate matter shall not exceed the level calculated with the equation $E = 55.0(P)^{0.11} - 40$ calculated to three significant figures.</p> <p>The maximum rated capacity of the batch plant is 60 cubic yards per hour, which equates to 120.7 tons of raw materials per hour. The process weight rate based particulate matter limit is applicable to the point sources, which would be the silos, the weigh hopper, and the associated baghouses. Therefore, the particulate</p>

		matter emission limit calculated using the equation above is 53.2 lbs/hr. The maximum potential emission rate is 45.3 lbs/hr for uncontrolled emissions and 2.42 lbs/hr for controlled emissions.
4.0521 – Control of Visible Emissions	CBP	For sources manufactured as of July 1, 1971, visible emissions shall not be greater than 40% opacity; for sources manufactured after this date, visible emissions shall not be greater than 20% opacity. This plant was constructed after July 1, 1971. Visible emissions from this facility would be controlled through the use of fabric filters on the storage silos, weigh hopper, and loading operations. The permit also includes inspection and maintenance requirements for the fabric filters per 4.0605 and 4.0611 to ensure proper operation of the control devices. Proper inspection and maintenance should be sufficient to meet the visible emission standards.
4.0540 – Particulates from Fugitive Non-Process Dust Emission Sources	All sources of fugitive non-process dust	The facility will be required to take reasonable precautions to prevent particulate matter from becoming airborne as a result of storage, transportation, processing, and handling of materials.
4.0605 – General Recordkeeping and Reporting Requirements	CBP	The facility is required to submit an annual report with the throughput of ready mix concrete.
17.0306 – Permits Requiring Public Participation	CBP	The Director has determined that the Agency will take public comments and hold a public hearing on the draft permit due to public interest related to this source. The procedures in 17.0307 will be followed for this process.

REGULATORY NOTES

None

SECTION D DETAILS

EMISSION INFORMATION

CALCULATION METHOD CODES (List all that apply)	1 = Stack test result 2 = Material (mass) balance 3 = EPA approved information (AP-42, CTG, etc.) 4 = Other (specify in table below)			
CALCULATION REJECTION CODES (List all that apply)	1 = Calculation error 2 = Wrong emission factor(s) used 3 = Control efficiency(ies) not accepted 4 = Other (specify in table below)			
EMISSION SOURCE (ID NO.)	CALCULATION METHOD CODE	ACCEPT OR REJECT?	CALCULATION REJECTION CODE	WNCRAQA CALCULATIONS ATTACHED?
CBP	3	NA	NA	Yes

EMISSION NOTES

All emissions were calculated by the WNCRAQA. The NC DENR DAQ spreadsheet for Concrete Batch Plants and the production limit of 33,000 cubic yards per year was used for all calculations. PM2.5 emissions were conservatively assumed to be the same as PM-10.

SECTION E

SUPPORTING DOCUMENTATION

(Provide brief description of any attachments)

1. Emissions calculations
2. Draft of permit
3. Permit Application
4. Zoning Consistency Letter from Buncombe County
5. Draft Public Notice

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION A; Issued 01/23/2006



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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

General Facility Information

COMPANY NAME:
 FACILITY ID NUMBER:
 PERMIT NUMBER
 FACILITY CITY:
 FACILITY COUNTY:
 SPREADSHEET PREPARED BY:

Blue Ridge Concrete
11-881
11-881-10
Weaverville
Buncombe
James Raiford

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT
 IS THE MAXIMUM THROUGHPUT A SYNTHETIC LIMIT?
 ACTUAL ANNUAL PRODUCTION

60	(yd ³ /hour)
1	(1=No, 2=Yes)
33000	(yd ³ /year)

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX
 PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX

100	(% by volume)
0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?
 IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?

2	(1=No, 2=Yes)
1	(1=No, 2=Yes)

Material Composition Information

Cement
 Supplement
 Coarse Aggregate
 Sand
 Water
 Total

		<u>Typical NC Comp.*</u>
410	lbs	410 lbs
120	lbs	120 lbs
1884	lbs	1884 lbs
1443	lbs	1443 lbs
167	lbs	167 lbs
4024	lbs	4024 lbs

* North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION A; Issued 01/23/2006



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PARTICULATE MATTER EMISSIONS INFORMATION

PARTICULATE EMISSIONS		Expected Actual		Potential Emissions			
		After Controls/Limit		Before Controls/Limit		After Controls/Limit	
Source	Pollutant	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
truck mix	PM	0.445	0.122	23.214	101.677	0.445	1.950
	PM10	0.167	0.046	6.630	29.041	0.167	0.731
central mix	PM	0.000	0.000	0.000	0.000	0.000	0.000
	PM10	0.000	0.000	0.000	0.000	0.000	0.000
cement silo	PM	0.012	0.003	8.856	38.789	0.012	0.053
	PM10	0.004	0.001	5.658	24.782	0.004	0.018
suppl. Silo	PM	0.032	0.009	11.304	49.512	0.032	0.140
	PM10	0.018	0.005	3.960	17.345	0.018	0.077
weigh hopper** [sand & aggr.]	PM	0.509	0.140	0.509	2.230	No Data	No Data
	PM10	0.240	0.066	0.240	1.049	No Data	No Data
sand & aggr.	PM	1.422	0.391	1.422	6.228	1.422	6.228
	PM10	0.684	0.188	0.684	2.996	0.684	2.996
TOTAL PM	PM	2.420	0.666	45.305	198.436	2.420	10.602
TOTAL PM10	PM10	1.112	0.306	17.172	75.213	1.112	4.872
Title V Potential	PM10				43.176		

**Actual weigh hopper (sand & aggr) emissions assumed uncontrolled since AP-42 reports "no data" for controlled.

ARSENIC EMISSIONS INFORMATION

ARSENIC EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
		Ref.	Arsenic lb/yr	Ref.	Arsenic lb/yr
truck mix	Arsenic	(ATC2005)	0.01390	(ATC2005)	0.22146
central mix	Arsenic	(ATC2005)	0.00000	(ATC2005)	0.00000
cement silo	Arsenic	(EPA2001)	0.00003	(EPA2001)	0.00046
supplement silo	Arsenic	(EPA2001)	0.00198	(EPA2001)	0.03154
TOTAL	Arsenic		0.01591		0.25345

(Arsenic TPER: 0.016 lb/yr)

BERYLLIUM EMISSIONS INFORMATION

BERYLLIUM EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
		Ref.	Beryllium lb/yr	Ref.	Beryllium lb/yr
truck mix	Beryllium	(EPA2001)	0.00091	(EPA2001)	0.01449
central mix	Beryllium	(No Data)	-	(No Data)	-
cement silo	Beryllium	(EPA2001)	0.00000	(EPA2001)	0.00005
supplement silo	Beryllium	(EPA2001)	0.00018	(EPA2001)	0.00285
TOTAL	Beryllium		0.00109		0.01739

(Beryllium TPER: 0.28 lb/yr)

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

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CADMIUM EMISSIONS INFORMATION

CADMIUM EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
Source	Pollutant	Ref.	Cadmium lb/yr	Ref.	Cadmium lb/yr
truck mix	Cadmium	(EPA2001)	0.00008	(EPA2001)	0.00126
central mix	Cadmium	(EPA2001)	0.00000	(EPA2001)	0.00000
cement silo	Cadmium	(EPA2001)	0.00000	(EPA2001)	0.00005
supplement silo	Cadmium	(EPA2001)	0.00004	(EPA2001)	0.00062
TOTAL	Cadmium		0.00012		0.00194

(Cadmium TPER: 0.37 lb/yr)

CHROMIUM EMISSIONS INFORMATION

CHROMIUM EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
Source	Pollutant	Ref.	Chromium lb/yr	Ref.	Chromium lb/yr
truck mix	Chromium	(EPA2001)	0.03585	(EPA2001)	0.57106
central mix	Chromium	(EPA2001)	0.00000	(EPA2001)	0.00000
cement silo	Chromium	(EPA2001)	0.00020	(EPA2001)	0.00312
supplement silo	Chromium	(EPA2001)	0.00242	(EPA2001)	0.03847
TOTAL	Chromium		0.03847		0.61266

(Chromium TPER: 0.013 lb/day)

LEAD EMISSIONS INFORMATION

LEAD EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
Source	Pollutant	Ref.	Lead lb/yr	Ref.	Lead lb/yr
truck mix	Lead	(EPA2001)	0.01338	(EPA2001)	0.21310
central mix	Lead	(EPA2001)	0.00000	(EPA2001)	0.00000
cement silo	Lead	(EPA2001)	0.00007	(EPA2001)	0.00117
supplement silo	Lead	(EPA2001)	0.00103	(EPA2001)	0.01640
TOTAL	Arsenic		0.01448		0.23068

MANGANESE EMISSIONS INFORMATION

MANGANESE EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
Source	Pollutant	Ref.	Manganese lb/yr	Ref.	Manganese lb/yr
truck mix	Manganese	(EPA2001)	0.18190	(EPA2001)	2.89711
central mix	Manganese	(EPA2001)	0.00000	(EPA2001)	0.00000
cement silo	Manganese	(EPA2001)	0.00079	(EPA2001)	0.01261
supplement silo	Manganese	(EPA2001)	0.00051	(EPA2001)	0.00807
TOTAL	Manganese		0.18319		2.91779

(Manganese TPER: 0.063 lb/day)

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION A; Issued 01/23/2006



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NICKEL EMISSIONS INFORMATION

NICKEL EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
Source	Pollutant	Ref.	Nickel	Ref.	Nickel
			lb/yr		lb/yr
truck mix	Nickel	(EPA2001)	0.04180	(EPA2001)	0.66578
central mix	Nickel	(EPA2001)	0.00000	(EPA2001)	0.00000
cement silo	Nickel	(EPA2001)	0.00028	(EPA2001)	0.00450
supplement silo	Nickel	(EPA2001)	0.00451	(EPA2001)	0.07190
TOTAL	Nickel		0.04660		0.74218

(Nickel TPER: 0.13 lb/day)

PHOSPHOROUS EMISSIONS INFORMATION

PHOSPHOROUS EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
Source	Pollutant	Ref.	Phosphorous	Ref.	Phosphorous
			lb/yr		lb/yr
truck mix	Phosphorous	(EPA2001)	0.10756	(EPA2001)	1.71319
central mix	Phosphorous	(EPA2001)	0.00000	(EPA2001)	0.00000
cement silo	Phosphorous	(No Data)	-	(No Data)	-
supplement silo	Phosphorous	(EPA2001)	0.00701	(EPA2001)	0.11164
TOTAL	Phosphorous		0.11457		1.82483

SELENIUM EMISSIONS INFORMATION

SELENIUM EMISSIONS		Actuals w/Controls/Limits		Potentials w/Controls/Limits	
Source	Pollutant	Ref.	Selenium	Ref.	Selenium
			lb/yr		lb/yr
truck mix	Selenium	(EPA2001)	0.00099	(EPA2001)	0.01574
central mix	Selenium	(No Data)	-	(No Data)	-
cement silo	Selenium	(No Data)	-	(No Data)	-
supplement silo	Selenium	(EPA2001)	0.00014	(EPA2001)	0.00228
TOTAL	Selenium		0.00113		0.01802

Bagfilter Evaluation - Fly Ash Silo

User Input

(User must supply information in blue (double outline).)

Optional user information is single outlined.

Particulate Material (by ash) Estimated Efficiency (%)

Actual Air Flow Rate (acfm) Cloth Area (sq ft)

Maximum Operating Temperature (F) Proposed Cloth Material

Pulse Jet?

Uncontrolled Particulate Rate (lb/hr) Process Rate (lb/hr)

Maximum Pressure Drop (in H2O) No. of compartments

Gas Stream Moisture (%) Fatted?

Time Between Cleanings (min) Cleaning Time (min)

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
0.25	0 - 0.5	0	0.0
0.75	0.5 - 1.0	0.5	3.0
3	1.0 - 5.0	1	20.0
7.5	5.0 - 10.0	5	38.0
15	10.0 - 20.0	10	59.0
20	> 20	20	100.0

Information Source(s)

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (fpm) Applicant Filtering Velocity (fpm)

Typical filtering velocity not exceeded.

Fabric Durability Analysis

Fabric appropriate for max. oper. temp. Chemical Resistance: Acid Alkali Organics

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr) Gas Stream Particulate Loadings (gr/dscf) Note: Correct gas stream temperature and moisture content must be entered!

The estimated collection efficiency may be unreasonable. See bagfilter efficiency calculation below!

Allowable Emissions per 2D .0515 (lb/hr)

Maximum Areal Dust Loading (gr/sq ft) Dust drag (K2) parameter (inH2O/fpm)/(lb/sq ft)

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-m (%)
0.0	91.00	0.00
3.0	94.00	2.82
17.0	99.90	16.98
18.0	99.90	17.98
21.0	99.99	21.00
41.0	99.99	41.00
Overall Control Efficiency =		99.78 %
Penetration =		0.22 %

Bagfilter evaluation developed by:

William D. Willets, M.S., E.I.T.
North Carolina Division of Environmental Management
Air Quality Permitting
Version 3.3; September 23, 1999

Bagfilter Evaluation - Truck Loadout

User Input

(User must supply information in blue (double outline).)

Optional user information is single outlined.

Particulate Material
Cement Estimated Efficiency (%) 99.9

Actual Air Flow Rate (acfm) 6,500 Cloth Area (sq ft) 1,433

Maximum Operating Temperature (F) 90 Proposed Cloth Material Polyester

Pulse Jet? no

Uncontrolled Particulate Rate (lb/hr) 45.3 Process Rate (lb/hr) 241,440

Maximum Pressure Drop (in H2O) 6 No. of compartments 2

Gas Stream Moisture (%) 23.00 Fatted? yes

Time Between Cleanings (min) 15.00 Cleaning Time (min) 1

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
0.25	0 - 0.5	0	0.0
0.75	0.5 - 1.0	0.5	3.0
3	1.0 - 5.0	1	20.0
7.5	5.0 - 10.0	5	38.0
15	10.0 - 20.0	10	59.0
20	> 20	20	100.0

Information Source(s)

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (fpm) 8.0 Applicant Filtering Velocity (fpm) 4.5

Typical filtering velocity not exceeded.

Fabric Durability Analysis

Fabric appropriate for max. oper. temp. Fair Fair Fair Fair

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr) 0.100 Gas Stream Particulate Loadings (gr/dscf)
 Uncontrolled 1.03 Note: Correct gas stream temperature and moisture content must be entered!
 Controlled 0.0023

The estimated collection efficiency may be unreasonable. See bagfilter efficiency calculation below!

Allowable Emissions per 2D .0515 (lb/hr) 53.19

Maximum Areal Dust Loading (gr/sq ft) 70.1 Dust drag (K2) parameter (inH2O/fpm)/(lb/sq ft) 0.013244

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-m (%)
0.0	91.00	0.00
3.0	94.00	2.82
17.0	99.90	16.98
18.0	99.90	17.98
21.0	99.99	21.00
41.0	99.99	41.00
Overall Control Efficiency = 99.78 %		
Penetration = 0.22 %		

Bagfilter evaluation developed by:

William D. Willets, M.S., E.I.T.
 North Carolina Division of Environmental Management
 Air Quality Permitting
 Version 3.3; September 23, 1999

Bagfilter Evaluation - Weigh Hopper

User Input

User must supply information in blue (double outline).

Optional user information is single outlined.

Particulate Material: Cement Estimated Efficiency (%): 99.9

Actual Air Flow Rate (acfm): 40 Cloth Area (sq ft): 16

Maximum Operating Temperature (F): 90 Proposed Cloth Material: Polyesters

Pulse Jet? no

Uncontrolled Particulate Rate (lb/hr): 45.3 Process Rate (lb/hr): 241,440

Maximum Pressure Drop (in H2O): 4 No. of compartments: 1

Gas Stream Moisture (%): 23.00 Fatted? yes

Time Between Cleanings (min): 3.00 Cleaning Time (min): 3

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
0.25	0 - 0.5	0	0.0
0.75	0.5 - 1.0	0.5	3.0
3	1.0 - 5.0	1	20.0
7.5	5.0 - 10.0	5	38.0
15	10.0 - 20.0	10	59.0
20	> 20	20	100.0

Information Source(s)

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (fpm): 8.0 Applicant Filtering Velocity (fpm): 2.5

Typical filtering velocity not exceeded.

Fabric Durability Analysis

Fabric appropriate for max. oper. temp. Chemical Resistance

	Acid	Alkali	Organics
	Fair	Fair	Fair

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr): 0.100 Gas Stream Particulate Loadings (g/dscf): 167.55 Note: Correct gas stream temperature and moisture content must be entered!

The estimated collection efficiency may be unreasonable. See bagfilter efficiency calculation below!

Allowable Emissions per 2D .0515 (lb/hr): 53.19

Maximum Areal Dust Loading (g/r/sq ft): 1255.4 Dust drag (K2) parameter ((inH2O/fpm)/(lb/sq ft)): 0.286948

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-m (%)
0.0	91.00	0.00
3.0	94.00	2.82
17.0	99.90	16.98
18.0	99.90	17.98
21.0	99.99	21.00
41.0	99.99	41.00
Overall Control Efficiency =		99.78 %
Penetration =		0.22 %

Bagfilter evaluation developed by:
 William D. Willets, M.S., E.I.T.
 North Carolina Division of Environmental Management
 Air Quality Permitting
 Version 3.3, September 23, 1999

Bagfilter Evaluation - Cement Silo

User Input

(User must supply information in blue (double outlining).)

Optional user information is single outlined.

Particulate Material
Cement Estimated Efficiency (%) 99.9

Actual Air Flow Rate (acfm) 1,200 Cloth Area (sq ft) 250

Maximum Operating Temperature (F) 90 Proposed Cloth Material Polyurethane

Pulse Jet? no

Uncontrolled Particulate Rate (lb/hr) 45.3 Process Rate (lb/hr) 241,440

Maximum Pressure Drop (in H₂O) 12 No. of compartments 1

Gas Stream Moisture (%) 23.00 Fatted? yes

Time Between Cleanings (min) 15.00 Cleaning Time (min) 8.5

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
0.25	0 - 0.5	0	0.0
0.75	0.5 - 1.0	0.5	3.0
3	1.0 - 5.0	1	20.0
7.5	5.0 - 10.0	5	38.0
15	10.0 - 20.0	10	59.0
20	> 20	20	100.0

Information Source(s)

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (ipm) 8.0 Applicant Filtering Velocity (ipm) 4.8

Typical filtering velocity not exceeded.

Fabric Durability Analysis

Fabric appropriate for max. oper. temp.	Chemical Resistance		
	Acid	Alkali	Organics
Fair	Fair	Fair	Fair

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr) 0.100 Gas Stream Particulate Loadings (gr/dscf)
 Uncontrolled 5.59 Note: Correct gas stream temperature and
 Controlled 0.0124 moisture content must be entered!

The estimated collection efficiency may be unreasonable.
 See bagfilter efficiency calculation below!

Allowable Emissions per 2D .0515 (lb/hr) 53.19

Maximum Areal Dust Loading (gr/sq ft) 401.7 Dust diag. (K₂) parameter ((inH₂O)/(pm))/(lb/sq ft) 0.143474

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-in (%)
0.0	91.00	0.00
3.0	94.00	2.82
17.0	99.90	16.98
18.0	99.90	17.98
21.0	99.99	21.00
41.0	99.99	41.00
Overall Control Efficiency =		99.78 %
Penetration =		0.22 %

Bagfilter evaluation developed by:

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