1st Time Title V Permit Application Review
c:\worddocument\titlev\3M Roofing Granule Manufacturing

Applicant :	**Site Location:**	**County :**
3M Industrial Mineral Products 3M Roofing Granule Manufacturing Operations Division of Industrial Mineral Products	Moncure	Chatham

Technical Contact:	**Phone:** (651) 778-6014	**Responsible Official:**	**Title:**
Ms. Belinda Wirth Senior Environmental Engineer	**email:** bmwirth1@MMM.com	Peter M. Flees (Delegated authority by Katherine E. Reed, Vice President, in application)	Plant Manager

Review Engineer:	**Signature:**	**Begin Review Date:**	**End Review Date:**
Booker T. Pullen		December 11, 2003	XXXXX ___2004

Regional Contact:	**Regional Office:**	**SIC Code:**	**Application Number:**
Charles McEachern	Raleigh	3295	1900104.03A

Existing Permit Number:	**New Permit Number:**	**Applicability:**
09006R00	09006T01	1st Time Title V (resubmission of application within one year of operation of the facility).

I. Introduction

The U.S. Environmental Protection Agency (EPA) has given **final** approval to North Carolina's Title V operating permits program effective on October 1, 2001. Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

This 1st Time Title V Air Permit application review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the DRAFT Title V operating permit. The primary source of information used to construct the DRAFT permit is the above referenced Air permit application.

II. Background Information

The DRAFT Title V operating permit replaces existing Air Quality Construction and Operation Permit No. 09006R00 issued on June 6, 2001which is scheduled to expire on May 31, 2006.

Pursuant to 15A NCAC 2Q .0506, 3M Roofing Granule Manufacturing Operations, located in Moncure, North Carolina, submitted its 1st Time Title V Air Permit application to the Division of Air Quality (DAQ) on March 3, 2003. This application was originally assigned to Mr. Bruce Ingle of the DAQ but was reassigned to Booker T. Pullen. The application was considered complete for processing on May 3, 2003. The DRAFT permit for this facility is required to go to public notice pursuant to 15A NCAC 2Q .0521. 3M Roofing Granule Manufacturing Operations **is subject to the Title V program because the emissions of all criteria pollutants exceed the Title V thresholds.**

III. Purpose of this application:

1. Apply for a 1st Time Title V Permit. This facility was required to submit a complete Title V permit application within 12 months of the startup of new sources at the facility. These sources began operation in March and April of 2002.

2. Add Coloring Line #3 to the existing facility's Coloring Lines #1 and #2. The crushing and screening lines have already been designed with sufficient capacity to support three coloring lines. Line #3 will use process combustion equipment with the same heating capacities as the units for Lines 1 and 2.

IV. Facility Description:

3M Roofing Granule Manufacturing Operations is a part of 3M Industrial Mineral Products which is a Division of 3M Company. The company produces granules for the asphalt shingle industry at this facility. Luck Stone supplies 4-inch stone from their stone crushing operation located on the premises and 3M Roofing Granule Manufacturing Operations then proceeds to crush, dry, screen, color and cure this material to produce the granules which it ships out in bulk trucks.

V. Statement of Compliance:

The DAQ has reviewed the compliance status of this facility. On its latest inspection by Mr. David Miller of the Raleigh Regional Office, performed on July 18, 2002, the facility was determined to be in compliance with all applicable requirements. The applicant has certified that the facility will be in compliance with all applicable requirements at the time of permit issuance and will continue to comply with these requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

VI. Summary of sources and control devices:

The following table identifies all emission sources for which this Title V Permit is being issued.

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Crushing And Screening Plants			
ES C23A **NSPS, Subpart OOO**	Conveyor 23A (Baghouse hopper screw conveyor to dust conveyor 23B)	CD B1	One crusher baghouse No. 1 (6,500 square feet of filter area)
ES 123 **NSPS, Subpart OOO**	Plant feed conveyor No. 1 (feed pile to surge bin)		
ES 412 **NSPS, Subpart OOO**	Surge bin (50 ton capacity)		
ES 607 **NSPS, Subpart OOO**	Feed conveyor No. 2 (surge bin to C crusher) and C crusher		
ES 3031 **NSPS, Subpart OOO**	M feed transfer bin		
ES 32 **NSPS, Subpart OOO**	L crusher product conveyor No. 17, two pickups (M feed transfer bin and L crusher No. 1 to M screen feed bin)		
ES 3941 **NSPS, Subpart OOO**	L crusher bin No. 1		
ES 4347 **NSPS, Subpart OOO**	L crusher feed conveyor No. 16A (L crusher feed bin to L crusher) and L crusher		
ES 2327A **NSPS, Subpart OOO**	G crusher feed bin No. 1		
ES 2426 **NSPS, Subpart OOO**	G crusher feed conveyor No. 8A (G crusher feed bin No. 1 to G crusher No. 1) and G crusher No. 1		
ES 16 **NSPS, Subpart OOO**	G crusher product conveyor No. 9 (G crusher to D screens No. 2 and No. 3 feed bin)		
ES C3 **NSPS, Subpart OOO**	Product conveyor No. 3 (C crusher to D screen bin No. 1)	CD B2	One screen baghouse No. 1 (11,750 square feet of filter area)
ES 8913A **NSPS, Subpart OOO**	D screen bin No. 1		
ES 8913B **NSPS, Subpart OOO**	D screen No. 1 feeder		
ES 8913C **NSPS, Subpart OOO**	D screen No. 1		
ES 8913D **NSPS, Subpart OOO**	Undersize conveyor No. 3 (D screen No. 1 to dryer feed conveyor No. 7)		
ES 8913E **NSPS, Subpart OOO**	C bin feed conveyor No. 4 (D screen No. 1 to C crusher bin)		
ES 8913F **NSPS, Subpart OOO**	Dryer feed conveyor No. 7 (undersize conveyor No. 3 to dryer)		
ES 1721A **NSPS, Subpart OOO**	D screen bin No. 2		

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VI. Summary of sources and control devices (continued):

The following table identifies all emission sources for which this Title V Permit is being issued (Continued)

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Crushing and Screening Plant - Continued			
ES 1721B **NSPS, Subpart OOO**	D screen No. 2 feeder	CD B2	One screen baghouse No. 1 (11,750 square feet of filter area)
ES 1721C **NSPS, Subpart OOO**	D screen No. 2		
ES 1721D **NSPS, Subpart OOO**	G crusher bin feed conveyor No. 5 (D screen No. 2 to G crusher bins)		
ES 1721E **NSPS, Subpart OOO**	L circuit new feed conveyor No. 13 (D screen No. 2 to M transfer bin)		
ES 32A **NSPS, Subpart OOO**	L crusher product conveyor No. 17 (L crushers to conveyor 18A)		
ES 32B **NSPS, Subpart OOO**	Conveyor No. 18A (L crusher product conveyor No. 17 to live M screens feed bin)		
ES340 **NSPS, Subpart OOO**	Live M screens feed bin, two pickups		
ES 3537A **NSPS, Subpart OOO**	M screen No. 1		
ES 3537B **NSPS, Subpart OOO**	M screen No. 2		
ES 3537C **NSPS, Subpart OOO**	M screen No. 3		
ES 3537D **NSPS, Subpart OOO**	L feed bin conveyor No. 14, three pickups (M screens to L crusher bins)		
ES 3537E **NSPS, Subpart OOO**	Grade collecting conveyor No. 19, three pickups (M screens 1, 2, and 3 to M screens 4, 5, 6)		
ES 3537F **NSPS, Subpart OOO**	Waste conveyor No. 21, three pickup points (M screens to waste bin)		
ES C23C **NSPS, Subpart OOO**	Dust conveyor 23C (baghouse hopper to dust elevator)	CD B4	Screen baghouse No. 2 (9,000 square feet of filter area)
ES 16 **NSPS, Subpart OOO**	Dryer and G crushers to D screen bin No. 2		
ES 1822A **NSPS, Subpart OOO**	D screen bin No. 3		
ES 1822B **NSPS, Subpart OOO**	D screen feeder No. 3		
ES 1822C **NSPS, Subpart OOO**	D screen No. 3		
ES 1822D **NSPS, Subpart OOO**	Feed conveyor No. 5, two pickups (D screens No. 2 and 3 to G crusher bin)		
ES 33A **NSPS, Subpart OOO**	Conveyor 18A (conveyor 17 to conveyor 18B)		
ES 33B **NSPS, Subpart OOO**	Conveyor 18B (conveyor 18A to live M feed bin)		
ES 340 **NSPS, Subpart OOO**	Live M feed bin, two pickups		
3537G **NSPS, Subpart OOO**	M screen No. 4		

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The following table identifies all emission sources for which this Title V Permit is being issued (Continued)

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Crushing and Screening Plants - Continued			
ES 3537H **NSPS, Subpart OOO**	M screen No. 5	CD B4	Screen baghouse No. 2 (9,000 square feet of filter area)
ES 3537I **NSPS, Subpart OOO**	M screen No. 6		
ES 3537J **NSPS, Subpart OOO**	L crusher feed bin conveyor No. 14, three pickups (M screens to L crusher)		
ES 3537K **NSPS, Subpart OOO**	Grade collecting conveyor No. 19, three pickup points (M screens to grade silos)		
ES 3527L **NSPS, Subpart OOO**	Waste conveyor, three pickups (M screen to waste bin)		
ES 2327B **NSPS, Subpart OOO**	Feed conveyor No. 6 (D screens to G crusher bins)	CD B5	Crusher baghouse No. 2 (5,250 square feet of filter area)
ES 38 **NSPS, Subpart OOO**	Conveyor No. 14 (M screens to conveyor 14A)		
ES 38B **NSPS, Subpart OOO**	Conveyor No. 14A (conveyor 14 to L crusher feed bins)		
ES 4042 **NSPS, Subpart OOO**	L crusher bin No. 2		
ES 4448 **NSPS, Subpart OOO**	L crusher feed conveyor No. 16B and L crusher No. 2		
ES 32 **NSPS, Subpart OOO**	L crusher product conveyor No. 17 (L crushers and M feed transfer bin to M screen feed bin)		
ES 2327 **NSPS, Subpart OOO**	G crusher bin No. 2		
ES 2729 **NSPS, Subpart OOO**	G crusher feed conveyor No. 88 and G crusher No. 2 (G crusher bin to G crusher)		
ES 16 **NSPS, Subpart OOO**	Dryer and G crusher product conveyor No. 3 (G crushers to D screens fed bin No. 2)		
ES 4042 **NSPS, Subpart OOO**	Transfer conveyor 14A (TC14A) into 90 ton #2, loadout from 90B2 onto sw feeder 16A (F16A) into L crusher #2 (RC2)		
ES 23C **NSPS, Subpart OOO**	Dust cover No. 23C (baghouse hopper loadout to dust elevator)	CD B6	Grade silo baghouse (5,250 square feet of filter area)
ES 49A **NSPS, Subpart OOO**	Grade collection conveyor No. 19 (M screens to grade bucket elevator)		
ES 49B **NSPS, Subpart OOO**	Grade bucket elevator, two pickups (grade collecting conveyor No. 19 to grade transfer conveyor No. 20)		
ES 50 **NSPS, Subpart OOO**	Grade transfer conveyor No. 20, two pickups (grade bucket elevator to grade silos)		
ES 5155A **NSPS, Subpart OOO**	Grade silo No. 1		
ES 5155B **NSPS, Subpart OOO**	Grade silo No. 2		
ES 57 **NSPS, Subpart OOO**	Grade silo conveyor No. 26, three pickups (grade silos to bin discharge bucket elevator)		
ES 57B **NSPS, Subpart OOO**	Bin discharge bucket elevator No 4, two pickups		
ES 58 **NSPS, Subpart OOO**	Grade transfer conveyor No. 27 (bin discharge elevator to coloring plant)		
ES A10 **NSPS, Subpart OOO**	11 grade 1500 ton silo #3		

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The following table identifies all emission sources for which this Title V Permit is being issued (Continued)

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Crushing and Screening Plant - Continued			
ES 63A **NSPS, Subpart OOO**	Dust conveyor No. 23C (hoppers for screens, grade silo, and waste baghouses to dust elevator)	CD B7	Waste handling (2,750 square feet of filter area)
ES 63B **NSPS, Subpart OOO**	Dust elevator, two pickups		
ES 6466 **NSPS, Subpart OOO**	Dust bin		
ES 68A **NSPS, Subpart OOO**	Waste conveyor No. 21		
ES 68B **NSPS, Subpart OOO**	Waste elevator, two pickups		
ES 6970 **NSPS, Subpart OOO**	Waste bin		
ES 6466SC **NSPS, Subpart OOO**	Dust bin screw conveyor (waste handling baghouse hopper to pug mill)		
F6771 **NSPS, Subpart OOO**	Enclosed pug mill with wet suppression (dust and waste processing)	N/A	N/A
F 72 **NSPS, Subpart OOO**	Enclosed waste stacker conveyor No. 25 with wet suppression (pug mill to outside storage)	N/A	N/A
F61 **NSPS, Subpart OOO**	Enclosed dust conveyor 23B (dust conveyor 23A to transfer conveyor 23C)	N/A	N/A
ESC 23A **NSPS Subpart OOO**	Dust conveyor No. 23A (dryer baghouse screw conveyors to dust conveyor 23B)	CD B3	Dryer baghouse (12,300 square feet of filter area)
ES 1415 **NSPS, Subpart UUU**	Natural gas-fired dryer (70 mmBtu per hour maximum heat input)	CD C1 CD B3	One dryer cyclone (eight feet in diameter) in series with Dryer baghouse (12,300 square feet of filter area)
ES A1 **NSPS Subpart OOO**	D Screen #4 assembly (includes the vibrator)	CD B16	One screen #3 baghouse (9,000 square feet of filter area)
ES A5 **NSPS Subpart OOO**	Load-in to 54 inch conveyor #18C		
ES A6 **NSPS Subpart OOO**	Line #3 live M feed bin		
ES A7 **NSPS Subpart OOO**	Line #3 M screen assemblies		
ES A11 **NSPS Subpart OOO**	Screen baghouse #3 ash loadout		
ES A2 **NSPS Subpart OOO**	G bin feed conveyor #6 loadout to bin feed conveyor #6A	CD B17	One crusher #3 baghouse (6500 square feet of filter area)
ES A3 **NSPS Subpart OOO**	G 60 ton feed bin #3		
ES A4 **NSPS Subpart OOO**	G crusher #3		
ES A8 **NSPS Subpart OOO**	90 ton feed bin #3		
ES A9 **NSPS Subpart OOO**	L crusher #3		
ES A12 **NSPS Subpart OOO**	Crusher baghouse #3 ash loadout		
None	Waste pile	N/A	N/A

The following table identifies all emission sources for which this Title V Permit is being issued (Continued)

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
	Coloring Plant		
ES CP1012A	Head lap bin	CD B8	Raw granule baghouse (5,750 square feet of filter area)
ES CP1012B	Transfer conveyor No. 27 (Grade silos to head lap and raw granule bins)		
ES CP1012C	Raw granule bin No. 1		
ES CP1012D	Raw granule bin No. 2		
ES CPPFC1	L1 dryer feed conveyor, two pickups (L1 raw granule and rerun bins to dryer)		
ES CPPFC2	L2 dryer feed conveyor, two pickups (L2 raw granule and rerun bins to dryer)		
ES CPA1	Raw granule transfer conveyor (RTC)/cov #27/ load-in to raw granule transfer conveyour 4 (RGTC4)/conv#46/		
ES CPA2	75 ton raw granule bin #3 (RGB3)		
ES CPA3	55 ton rerun bin #3 (RRB3)		
ES CPL1-280A	Blend bin No. 1A	CD B15	Finished granule baghouse (6,111 square feet of filter area)
ES CPL1-280B	Product/blend bin No. 1B		
ES CPL1-280C	Product/blend bin No. 1C		
ES CPL1-600	R screen No. 1		
ES CPL2-280A	Blend bin No. 2A		
ES CPL2-280B	Product/blend bin No. 2B		
ES CPL2-280C	Product bin No. 2C		
ES CPL2-600	R screen No. 2		
ES CPL3-600	R screen No. 3		
ES CP900	Waste bin (55 ton)		
ES CPA9	Line #3 product elevator #9, product and blend bins		
ES CPA10	R screen for line #3 (ROT4)		
ES CPCC	L1 rerun conveyor (consolidation conveyor to rerun) elevator No. 1)		
ES CPLA2	One mixer, line 1	CD B11	One baghouse (2, 889 square feet of filter area)
ES CPLB2	One mixer, line 2	CD B12	One baghouse (2, 889 square feet of filter area)
ES CPLA4 ESCPLB4	Two Coolers lines 1 and 2 respectively	N/A	N/A
ES CPLA3	One natural gas-fired kiln (80 mmBtu per hour maximum heat input), line 1	CD B13	One baghouse (11,111 square feet of filter area)
ES CPLB3	One natural gas-fired kiln (80 mmBtu per hour maximum heat input), line 2	CD B14	One baghouse (11,111 square feet of filter area)
ES CPLA1 **NSPS, Subpart UUU**	One natural gas-fired dryer (30 mmBtu per hour maximum heat input), line 1	CD B9	One baghouse (7,111 square feet of filter area)
ES CPLB1 **NSPS, Subpart UUU**	Natural gas-fired dryer (30 mmBtu per hour maximum heat input), line 2	CD B10	L2 dryer No. 2 baghouse (7,111 square feet of filter area)
FCP363940	Finished product storage bins (75 ton capacity)	N/A	N/A
ES CPA4	Dryer, Line #3	CD B18	One baghouse (7,111 square feet of filter area)
ES CPA5	Mixer (M3)	CD B19	One baghouse (2,889 square feet of filter area)
ES CPA6	Kiln feed elevator 3 (KFE3)	CD B20	One baghouse (11,111 square feet of filter area)
ES CPA7	Kiln #3 (K3)		
ES CPA8	Cooler #3 (C3)	N/A	N/A
F CPA11	Product conveyor #1 and #2 loadouts to railcars	N/A	N/A

CRUSHING AND SCREENING PLANT

VII. Emission Source-by-Source Evaluation:

A. One Crushing and Screening Plant consisting of:

- Conveyor 23A (ID No. ES C23A) - baghouse hopper screw conveyor to dust conveyor 23 B
- Conveyor No. 1 (ID No. ES 123) - plant feed conveyor No. 1 feed pile to surge bin
- Surge bin, 50 ton capacity (ID No. ES412)
- Conveyor No. 2 (ID No. ES 607) - surge bin to C crusher and C crusher
- M feed transfer bin (ID No. ES 3031)
- Conveyor No. 17 {L crusher product, two pickups, (ID No. 32)}- M feed transfer bin and L crusher No. 1 to M screen feed bin
- L crusher bin No. 1 (ID No. ES 3941)
- L crusher feed conveyor No. 16A {L crusher feed bin to L crusher and L crusher (ID No. ES 4347)}
- G crusher feed bin No. 1 (ID No. ES 2327A)
- G crusher feed conveyor No. 8A {G crusher feed bin No. 1 to G crusher No. 1 and G crusher No. 1, (ID No. ES 2426)}
- G crusher product conveyor No. 9 {G crusher feed bin No. 1 to D screens No. 2 and No. 3 feed bin, ID No. ID No. ES 16}

With associated crusher baghouse No. 1 (6,500 square feet of filter area, ID No. CD B1)

- Product conveyor No. 3 {C crusher to D screen No. 1 (ID No. ES C3)}
- D screen No. 1 (ID No. ES 8913A**)**
- D screen No. 1 feeder (ID No. ES 8913B)
- D screen No. 1 (ID No. ES 8913D)
- Undersize conveyor No. 3 {D screen No. 1 to dryer feed conveyor No. 7, (ID No. ES 8913D)
- C bin feed conveyor No. 4 {D screen No. 1 to C crusher bin, (ID No. ES 8913E)}
- Dryer feed conveyor No. 7 {undersize conveyor No. 3 to dryer, (ID Nos. 8913F)}
- D screen bin No. 2 (ID No. ES 1721A)
- D screen No. 2 feeder (ID No. ES 1721B)
- D screen No. 2 (ID No. ES 1721C)
- G crusher bin feed conveyor No. 5 {D screen No. 2 to G crusher bins, (ID No. ES 1721D)}
- L circuit new feed conveyor No. 5 {D screen No. 2 to M transfer bin, (ID No. ES 1721E)}
- L crusher product conveyor No. 17 {L crushers to conveyor 18A, (ID No. ES 32A)}
- Conveyor No. 18A {L crusher product conveyor No. 17 to live M screens feed bin, (ID No. ES 32B)}
- Live M screens feed bin, two pickups (ID No. ES 340)
- M screen No. 1, (ID No. ES 3537A)
- M screen No. 2, (ID No. ES 3537B)
- M screen No. 3, (ID No. ES 3537C)
- L feed bin conveyor No. 14, three pickups {M screens to L crusher bins, (ID No. ES 3537D)}
- Grade collecting conveyor No. 19, three pickups {M screens 1, 2, and 3 to M screens 4, 5, and 6, (ID No. ES 3537E)}
- Waste conveyor No. 21, three pickup points {M screens to waste bin (ID No. ES 3537F)}

With associated screen baghouse No. 1 (11,750 square feet of filter area, ID No. CDB2)

- Dust conveyor 23C {baghouse hopper to dust elevator, (ID No. ES C23C)}
- GPC 9 load out into splitter for D feed bins 2 and 3 (ID No. ES 16)
- D screen bin No. 3 (ID No. ES 1822A)
- D screen feeder No. 3 (ID No. ES 1822B)
- D screen No. 3 (ID No. ES 1822C)
- Feed conveyor No. 5, two pickups {D screens No. 2 and 3 to G crusher bin (ID No. 1822D)}
- Conveyor 18A {conveyor 17 to conveyor 18B (ID No. ES 33A)}
- Conveyor 18B {conveyor 18A to live M feed bin, (ID No. ES 33B)}

CRUSHING AND SCREENING PLANT - Continued

VII. Emission Source-by-Source Evaluation (Continued):

A. One Crushing and Screening Plant consisting of: (Continued)

- Live M feed bin, two pickups (ID No. ES340)
- M screen No. 4 (ID No. 3537G)
- M screen No. 5 (ID No. 3537H)
- M screen No. 6 (ID No. 3537I)
- L crusher feed bin conveyor No. 14, three pickups {M screens to L crusher (ID No. 3537J)
- Grade collecting conveyor No. 19, three pickup points {M screens to grad silos (ID No. 3537K)
- Waste conveyor No. 21, three pickups (M screen to waste bin, ID No. ES 3527L)

With associated screen baghouse No. 2 (9,000 square feet of filter area, ID No. CDB4)

- Feed conveyor No. 6 (D screens to G crusher bins)
- Conveyor No. 14 (M screens to conveyor 14A, ID NO. ES 38)
- Conveyor No. 14A (conveyor 14 to L crusher feed bins)
- L crusher bin No. 2 (ID NO. ES 4042)
- L crusher feed conveyor No. 16B and L crusher No. 2 (ID No. ES 4448)
- L crusher product conveyor No. 17 {L crushers and M feed transfer bin to M screen feed bin (ID No. ES 32)}
- G crusher bin No. 2 (ID No. ES 2327)
- G crusher feed conveyor No. 88 and G crusher No. 2 {G crusher bin to G crusher (ID No. ES 2729)}
- Dryer and G crusher product conveyor No. 3 {G crushers to D screen fed bin No. 2 (ID No. ES 16)}
- Transfer conveyor 14A into 90 ton #2, loadout from 90B2 onto sw feeder 16A into L crusher #2 (ID No. ES 4042)

With associated crusher baghouse No. 2 (5,250 square feet of filter area, ID No. CD B5)

- Dust cover No. 23C {baghouse hopper load out to dust elevator (ID No. ES 23C)}
- Grade collection conveyor No. 19, ID No. ES 49A {M screens to grade bucket elevator)}
- Grade bucket elevator, ID No. ES 49B, two pickups {grade collecting conveyor No. 19 to grade transfer conveyor No. 20)}
- Grade transfer conveyor No. 20, ID No. ES 50, two pickups {grade bucket elevator to grade silos)}
- Grade silo No. 1 (ES 5155A)
- Grade silo No. 2 (ES 5155B)
- Grade silo conveyor No. 26, ID No. ES 57, three pickups {grade silos to bin discharge bucket elevator)}
- Bin discharge bucket elevator No. 4, two pickups
- Grade transfer conveyor No. 27, ID No. ES 58, {bin discharge elevator to coloring plant)}
- 11 grade 1500 ton silo #3

With associated grade silo baghouse No. 1 (5,250 square feet of filter area, ID No. CD B6)

- Dust conveyor No. 23C {hoppers for screens, grade silo, and waste baghouses to dust elevator (ID No. ES63A)}
- Dust elevator, two pickups (ES 63B)
- Dust bin (ES 6466)
- Waste conveyor No. 21 (ES 68A)
- Waste elevator, two pickups (ES 68B)
- Waste bin (ID NO. ES 6970)
- Dust bin screw conveyor {waste handling baghouse hopper to pugmill, ID No.ES 6466SC)}

With associated waste handling baghouse (2,750 square feet of filter area, ID No. CDB7)

- D Screen #4 assembly (ID No. ES A1, includes the vibrator)
- Load-in to 54 inch conveyor #18C (ID No. ES A5)
- Line #3 live M feed bin (ID No. ES A6)
- Line #3 M screen assemblies (ES A7)

VII. Emission Source-by-Source Evaluation (Continued):

A. One Crushing and Screening Plant (1, 2, & 3) consisting of: (Continued)

- D Screen #4 assembly (ID No. ES A1, includes the vibrator)
- Load-in to 54 inch conveyor #18C (ID No. ES A5)
- Line #3 live M feed bin (ID No. ES A6)
- Line #3 M screen assemblies (ID No. ES A7)
- Screen baghouse #3 ash loadout (ID No. ES A11)

With associated screen #3 baghouse (9,339 square feet of filter area, ID No. CD B16)

- G bin feed conveyor #6 loadout to bin feed conveyor #6A (ID No. ES A2)
- G 60 ton feed bin #3 (ID No. ES A3)
- G crusher #3 (ID No. ES A4)
- 90 ton feed bin #3 (ID No. ES A8)
- L crusher #3 (ID No. ES A9)
- Crusher baghouse #3 ash loadout (ID No. ES A12)

With associated crusher #3 baghouse (6500 square feet of filter area, ID No. CD B17)

- Enclosed pugmill (ID No. F6771) with wet suppression - dust and waste processing
- Enclosed waste stacker conveyor No. 25 (ID No. F72) with wet suppression – pugmill to outside storage
- Enclosed dust conveyor 23B (ID No. F61) - dust conveyor 23A to transfer conveyor 23C
- Dust conveyor No. 23A (ID No. ESC23A) - dryer baghouse screw conveyors to dust conveyor 23B with associated dryer baghouse (12,300 square feet of filter area, ID No. CDB3)
- Waste pile

1. **Description:** The Crushing and Screening Plant receives 4-inch stone from the Luck Stone Quarry Operation, located on the premises. Processing consists of repeated steps of crushing and screening the rock until it is uniformly sized to Grade 11. Then, the crushed rock is fed by underground conveyor from the storage pile to the secondary crusher. The crushed material is next sent to screening equipment where the smaller material is sent to a dryer and the oversize rocks are returned to the crusher for further size reduction. After drying, the material is sent to another screening operation. Particles in the desired size range are conveyed to the storage bins, but the unacceptable oversized granules are sent to tertiary crushers for further size reduction. The final screening process takes place at screens fed by the storage bin. All of the properly sized material is conveyed from here to Raw Granule Storage. The oversized material is sent to the quaternary crusher for final size adjustment and, after crushing, is re-circulated through the screeners. This cycle continues until the material is small enough to sent to Raw Granule Storage or is too small for use as roofing granule and is screened out for disposal. These grade 11 granules are the plant's final product. The granules are eventually sent from storage to the Coloring Plant as raw material for production of colored roofing granules.

2. **Applicable Regulatory Requirements**: The Crushing and Screening Operations are subject to 40 CFR Part 60, Subpart OOO.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate emissions	Work practice standards	15A NCAC 2D .0510
Stack particulate emissions (For conveyors, screening operations, screen feeders, storage bins, elevators, and building vents)	0.05 grams/dscm	15A NCAC 2D .0524 **40 CFR Part 60, Subpart OOO**
Stack visible emissions (For conveyors, screening operations, screen feeders, storage bins, elevators)	7 percent opacity	15A NCAC 2D .0524 **40 CFR Part 60, Subpart OOO**
Visible emissions (fugitive) (For conveyors, screening operations, screen feeders, storage bins, elevators, and building vents)	10 percent opacity	15A NCAC 2D .0524 **40 CFR Part 60, Subpart OOO**

CRUSHING AND SCREENING PLANT – Continued

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible emissions (For crushing and screening building)	Zero opacity	15A NCAC 2D .0524 **40 CFR Part 60, Subpart OOO**
Fugitive non-process particulate dust	Work practice standards	15A NCAC 2D .0540

a. **15A NCAC 2D .0510 "Particulates Form Sand, Gravel, or Crushed Stone Operations"**
The owner or operator of a sand, gravel, or crushed stone operation shall not cause, allow, or permit any material to be produced, handled, transported or stockpiled without taking measures to reduce to a minimum any particulate matter from becoming airborne to prevent exceeding the ambient air quality standards beyond the property line for particulate matter, both PM10 and total suspended particulates.

i. Fugitive non-process dust emissions from sand, gravel, or crushed stone operations shall be controlled by Rule .0540 of this Section.

ii. The owner or operator of any sand, gravel, or crushed stone operation shall control process-generated emissions:
(A) from crushers with wet suppression, and
(B) from conveyors, screens, and transfer points, such that the applicable opacity standards in Rule 15A NCAC 2D .0524 are not exceeded.

Note: The processes at this Roofing and Granuale facility that are located inside of the Crushing and Screening Buildings are dry operations, and do not employ wet suppression. These systems are enclosed and use baghouses to control emissions of particulate. The sources located outside of these building may employ wet suppression (pugmill, and waste stacker).

Uncontrolled emissions of PM-10 from the materials handling and processing operations listed above were determined from AP-42 Section 11.19.2 (1/95) for Crushed Stone Processing. TSP emissions were estimated based on the TSP to PM-10 ratio of 2.1 to 1 provided by AP-42. *These calculations were done in the original submittal (Permit No. 09006T00) for this facility*. Confidential process diagrams indicate that all conveyors are under negative pressure from one or more pick-ups which results in the collection of emissions at transfer points which have no pick-ups. The source list above goes beyond the application in that each transfer operation is depicted separately for compliance review rather than as a source group. Emissions estimates provided by the applicant remain relevant because AP-42 emission factors include transfer to and from the process as well as the process emissions.

Controlled emission factors were calculated using a fabric filter control efficiency of 99.92, a 97 percent emissions reduction for wet suppression, and a passive 90 percent control efficiency for enclosures. The fabric filter control systems were certified by David J. Heron, professional engineer temporarily licensed in the State of North Carolina, to achieve a maximum outlet grain loading of 0.01 grains per dry standard cubic foot.

The owner or operator shall control process-generated emissions from crushers with wet suppression, and from conveyors, screens, and transfer points such that the applicable opacity standards in Rule .0521 or .0524, of this Section are not exceeded.

The five crushers will be enclosed and controlled with two collection systems using fabric filter control. They are required to employ wet suppression to the extent necessary to comply with the applicable opacity standards should the enclosures and fabric filter controls prove to be insufficient.

Compliance is expected with this regulation for particulate emissions from the crusher and screening plant.

CRUSHING AND SCREENING PLANT – Continued

Monitoring/Recordkeeping/Reporting

iii. Monitoring, recordkeeping, and reporting is satisfied by the monitoring, recordkeeping, and reporting required by 15A NCAC 2D .0524, 40 CFR Part 60, Subpart OOO.

b. 15A NCAC 2D .0524 "NSPS 40 CFR Part 60, Subpart OOO"

i. For the conveyors, screening operations, screen feeders, storage bins, elevators, and building vents, the Permittee shall comply with all applicable provisions, including the notification, testing, reporting, recordkeeping, and monitoring requirements contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards" (NSPS) as promulgated in **40 CFR 60, Subpart OOO**, including Subpart A "General Provisions." [15A NCAC 2D .0524]

This subpart allows two options for particulate emissions standards. 3M Industrial Mineral Roofing Products selected the following method/standard to show to comply with this regulation.

$$\frac{0.05\ grams}{s\tan dard\ cubic\ meter} \times \frac{15.432\ grains}{gram} \times \frac{cubic\ meters}{35.315\ cubic\ feet} = \frac{0.02\ grains}{s\tan dard\ cubic\ feet}$$

ii. The building enclosing the affected facility or facilities must comply with the following emission limits:

Emissions Limitations - [15A NCAC 2D .0524]

(A) **No visible fugitive emissions** shall to be discharged into the atmosphere from any building enclosing any transfer point on a conveyor belt or any other affected facility (screening operations, screen feeders, storage bins, elevators, etc.) except emissions through a vent as defined in 40 CFR Part 60, Subpart OOO, §60.671.

(B) Particulate emissions from any vent of any building enclosing any transfer points on a conveyor belt or any other affected facility (screening operations, screen feeders, storage bins, elevators, etc.) except emissions from a vent as defined in 40 CFR Part 60, Subpart OOO, §60.671, shall not be more than **0.05 grams/dscm (0.02 grains/dry standard cubic foot);**

(C) Visible emissions from any vent of any building enclosing any transfer points on a conveyor belt or any other affected facility (screening operations, screen feeders, storage bins, elevators, etc.) shall not be more than **7 percent.**

This NSPS provides two compliance options. The DAQ has determined that Permittee may show initial compliance with NSPS requirements for stack and fugitive emissions from affected facilities within a building by showing that each individual affected unit complies with the particulate and opacity requirements, or show that the building and its vents comply with the particulate and opacity requirements.

C Stacks at affected facilities shall not discharge particulate emissions in excess of 0.05 grams per dry standard cubic meter (0.02 grains per dry standard cubic foot) and seven percent opacity. The applicant has stated that all fabric filter control devices will be designed to achieve an outlet grain loading of 0.01 grains per dry standard cubic feet. The controlled emission rate of 0.01 grains per standard dry cubic foot for all processes meets this particulate standard. Compliance testing is required to determine compliance with the particulate and opacity standards; **and**

- Fugitive emissions from each affected facility must not exceed an opacity of 10 percent. Compliance testing is required determine compliance with the opacity standard on a per source basis for all uncontrolled and fugitive affected sources.

or

CRUSHING AND SCREENING PLANT – Continued

- Building vents at affected facilities shall not discharge particulate emissions in excess of 0.05 grams per dry standard cubic meter (0.02 grains per dry standard cubic foot) and seven percent opacity and the building must not have any visible fugitive emissions due to uncontrolled emission sources contained within the building.

Based on emission limitations above, the performance testing (Method 5 and Method 9) were completed on August 5-8, 2002. Compliance is indicated with this regulation.

Testing [15A NCAC 2D .0501(c)(8)]

iii. If additional emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(8) and General Condition JJ. If the results of this test are above the limit given in Section VII. A. 2. b. i. or ii. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring [15A NCAC 2Q .0508(f)]

iv. To assure compliance, **once a month,** the Permittee shall observe the emission sources for any visible emissions above normal. The Permittee shall establish "normal" for the sources in the first 30 days following permit issuance. If visible emissions from these sources are observed to be above normal, the Permittee shall either: (a) be deemed to be in noncompliance with 15A NCAC 2D .0521 or (b) demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 2D .0501(c)(8) is below the limit given in Section VII. A. 2. b. i., or ii. above. If the demonstration in (b) above cannot be made, the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0521.

Recordkeeping [15A NCAC 2Q .0508(f)]

v. The results of the monitoring shall be maintained in a logbook (written or electronic format) on site and made available to an authorized representative upon request. The logbook shall record the following:
   (A) the date and time of each recorded action;
   (B) the results of each observation and/or test noting those sources with emissions that were observed to be in noncompliance along with any corrective actions taken to reduce visible emissions; and
   (C) the results of any corrective actions performed.

   The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521 if these records are not kept.

Reporting [15A NCAC 2Q .0508(f)]

vi. The Permittee shall submit a summary report of the observations by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

c. 15A NCAC 2D .0540 "Particulates From Fugitive Non Process Dust Emission Sources"

For the purpose of this Rule the following definitions shall apply:

i. "Fugitive non-process dust emission" means particulate matter that is not collected by a capture system and is generated from areas such as pit areas, process areas, haul roads, stockpiles, and plant roads.

ii. "Substantive complaints" means complaints that are verified with physical evidence acceptable to the Division.

CRUSHING AND SCREENING PLANT – Continued

iii. The owner or operator of a facility required to comply with rule 15A NCAC 2D .0510, Particulates from Sand, Gravel, or Crushed Stone Operations, shall not cause or allow fugitive non-process dust emissions to cause or contribute to substantive complaints.

iv. If fugitive non-process dust emissions from a facility required to comply with this Rule cause or contribute to substantive complaints, the owner or operator of the facility shall:

(A) within 30 days upon receipt of written notification from the Director of a second substantive complaint in a 12-month period, submit to the Director a written description of what has been done and what will be done to reduce fugitive non-process dust emissions from that part of the facility that caused the second substantive complaint;

(B) within 90 days of receipt of written notification from the Director of a second substantive complaint in a 12-month period, submit to the Director a control plan; and

(C) within 30 days after the Director approves the plan, be in compliance with the plan.

v. If after a plan has been implemented, the Director finds that the plan inadequately controls fugitive non-process dust emissions, he shall require the owner or operator of the facility to correct the deficiencies in the plan. Within 90 days after receiving written notification from the Director identifying the deficiency, the owner or operator of the facility shall submit a revision to his plan to correct the deficiencies.

Monitoring/Recordkeeping/Reporting

vi. No monitoring, recordkeeping, or Reporting is required at this time.

B. One natural gas-fired dryer (70 million Btu per hour maximum heat input, ID No. ES 1415, NSPS) with associated cyclone (eight feet in diameter, ID No. CDC1) in series with one baghouse (12,300 square feet of filter area, ID No. CDB3)

1. **Description:** This natural gas-fired unit is a dryer by definition as listed in 40 CFR Part 60, Subpart UUU, because it is used to remove moisture from the crushed and screened granules of rock. It is not a calciner, nor is the dryer "in series" with a calciner per the definition in 40 CFR Part 60, Subpart UUU, §60.731.
2. **Applicable Regulatory Requirements**: This dryer is subject to 40 CFR Part 60, Subpart UUU "Standards of Performance for Calciners and Dryers in Mineral Industries" because it is a dryer located at a mineral processing plant and was constructed after April 23, 1986.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Particulate emissions	0.057 g/dscm	15A NCAC 2D .0524 **40 CFR Part 60, Subpart UUU**
Visible emissions	10 percent opacity	15A NCAC 2D .0524 **40 CFR Part 60, Subpart UUU**

a. 15A NCAC 2D .0516 "Sulfur Dioxide Emissions From Combustion Sources"

i. **Regulation Analysis:**

Sulfur dioxide emissions from the dryer (ID No. ES 1415) that is discharged from any vent, stack, or chimney shall not exceed **2.3 pounds per million Btu heat input.**

Natural gas is inherently low in sulfur dioxide content. Potential emissions of sulfur dioxide **from the burning of natural gas** was estimated using the maximum heat input of the dryer AP-42 factors, Supplement E, revised 9/98, a heating value of 1030 Btu per million cubic feet of natural gas.

Emission factor for sulfur dioxide = 0.6 lbs SO_2 per million standard cubic feet
Heat content of natural gas = 1020 Btu per million cubic feet

$$\frac{0.6\,lbs\,SO_2}{1\times10^6\,cubic\ feet}\times\frac{1\,cubic\ feet}{1020\,Btu}\times\frac{1\times10^6\,Btu}{1.0\,mmBtu}=5.8\times10^{-4}\,\frac{lbs\,SO_2}{mmBtu}$$

CRUSHING AND SCREENING PLANT – Continued

Compliance is indicated for this dryer since the potential emissions of sulfur dioxide **(5.88 x 10^{-4} lbs SO_2)** are less than the allowable emissions of sulfur dioxide (**2.3 lbs SO_2 per million Btu heat input)**.

Testing [15A NCAC 2D .0501(c)(4)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(4) and General Condition JJ found in Section 3 of the Air Permit. If the results of this test are above the limit given in Section VII. B. 2. a. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas in dryer (ID No. ES-1415).

b. 15A NCAC 2D .0524, Subpart UUU "New Source Performance Standards For Calciners and Dryers in Mineral Industries"

i. For dryer (ID No. ES 1415), the Permittee shall comply with all applicable provisions, including the notification, testing, reporting, recordkeeping, and monitoring requirements contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards (NSPS)" as promulgated in 40 CFR Part 60 Subpart UUU, including Subpart A "General Provisions."[15A NCAC 2D .0524]

Emission Limitations [15A NCAC 2D .0524]

ii. Particulate matter emissions from dryer (ID No. ES 1415) shall not exceed **0.057 gm/dscm**.

iii. Visible emissions from dryer (ID No. ES 1415) shall not exceed **10 percent opacity**.

Particulate emission factors for the dryer were developed from emissions testing at the 3M Wausau facility. All particulate emissions are assumed to be PM-10. The test data was for controlled emissions and an estimated control efficiency of 99.9 percent for the Wausau fabric filter. The cyclone and fabric filter control for the proposed dryer are estimated to achieve an overall control efficiency of 99.96 percent (99.92 percent for the fabric filter and 50 percent for the cyclone). This is equal to approximately 0.01 grains per dry standard cubic foot. The fabric filter control system was certified by David J. Heron, who is a professional engineer temporarily licensed in the State of North Carolina. Compliance is expected for particulate emissions from this dryer.

Testing [15A NCAC 2D .0501(c)(8)]

iv. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ and 40 CFR Part 60, Subpart UUU, §60.736. If the results of this test are above the limit given in Section VII. B. 2. b. ii. and iii. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f)]

iii. (A) Under the provisions of NCGS 143-215.108, the Permittee shall demonstrate compliance with the emission limits in Section VII B. 2. b. ii. above in a performance test by testing dryer (ES 1415) for particulate emissions by utilizing EPA test method 5. The sampling time shall be and volume for each test run shall be at least 2 hours and 1.70 dscm. [40 CFR Part 60, Subpart UUU, §60.736] *Note : testing was completed on August 5-8, 2002.*

(B) If emissions testing is required, the Permittee shall demonstrate compliance with the visible emissions limit in Section VII B. 2. b. iii. above by testing the dryer (ES 1415) for opacity by utilizing EPA test method 9. [40 CFR Part 60, Subpart UUU, §60.736] *Note : testing (using Method 9) for visible emissions was completed on August* 5-8, 2002.

CRUSHING AND SCREENING PLANT – Continued

(C) The owner and operator of an affected facility subject to the provisions of this subpart who uses a dry control device to comply with the mass emission standard shall install, calibrate, maintain, and operate a continuous monitoring system to measure and record the opacity of emissions that are discharged into the atmosphere from the control device. [40 CFR Part 60, Subpart UUU, §60.734]

Records of monitoring shall be kept for a minimum of 5 years.

(D) Particulate matter emissions from dryer ID No. ES 1415 shall be controlled by bagfilter ID No. CDB3. To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer□s inspection and maintenance recommendations, or if there is no manufacturer□s inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:

i. a annual visual inspection of the system ductwork and material collection unit for leaks; and
ii. an annual (for each 12 month period following the initial inspection) internal inspection of the bagfilter's structural integrity.
iii. an annual (for each 12 month period following the initial inspection) inspection of the cyclone for structural integrity.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if the ductwork and bagfilters are not inspected and maintained.

(E) The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
(1) the date and time of each recorded action;
(2) the results of each inspection;
(3) the results of any maintenance performed on the bagfilters; and
(4) any variance from manufacturer's inspection and maintenance recommendations, if any, and corrections made.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524 if these records are not maintained.

Reporting [15A NCAC 2Q .0508(f)]

vi. The Permittee shall submit a summary report of the monitoring requirements by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

COLORING PLANT (LINES 1, 2, and 3)

VII. Emission Source-by-Source Evaluation (continued)

A. One Coloring Plant (Line Nos. 1 and 2) consisting of:

- Head lap bin (ID No. ESCP-1012A)
- Transfer conveyor No. 27 (Grade silos to head lap and raw granule bins, ID No. ESCP-1012B)
- Raw granule bin No. 1 (ID No. ESCP-1012C)
- Raw granule bin No. 2 (ID No. ESCP-1012D)
- L1 dryer feed conveyor, two pickups (L1 raw granule and rerun bins to dryer, ESCPPFC-1)
- L2 dryer feed conveyor, two pickups (L2 raw granule and rerun bins to dryer, ESCPPFC-2)
- Raw tranfer conveyor (RTC, ID No. ES CPA1)
- 75 ton raw granule bin #3 (FGB3, ID No. ES CPA2)
- 55 ton rerun bin #3 (RRG3, ES CPA3)

With associated raw granule baghouse (5,750 square feet of filter area, ID NO. CD B8)

COLORING PLANT (LINES 1, 2, AND 3) – Continued

- Blend bin No. 1A (ID No. ESCPL1-280A)
- Product/blend bin No. 1B (ID No. ESCPL1-280B)
- Product/blend bin No. 1C (ID No. ESCPL1-280C)
- R screen No. 1 (ID No. ESCPL1-600)
- Blend bin No. 2A (ID No. ESCPL2-280A)
- Product/blend bin No. 2B (ID No. ESCPL2-280B)
- Product bin No. 2C (ID No. ESCPL2-280C)
- R screen No. 2 (ID No. ESCPL2-600)
- R screen No. 3 (ID No. ESCPL3-600)
- Waste bin (55 ton, ID No. ESCP-900)
- L1 rerun conveyor (consolidation conveyor to rerun elevator No. 1, ID No. ESCPCC)
- Line #3 product elevator #9, product and blend bins (ID No. ES CPA9)
- R screen for line #3 (ROT4), ID No. ES CPA10

With associated finished granule baghouse (6,111 square feet of filter area, ID No. CD-B15)

- Finished product storage bins (75 ton capacity, FCP363940)
- Truck loading (ID Nos. FCP44A and FCP44B)
- Product conveyor #1 and #2 loadouts to railcars (ID No. F-CPA11)
- Kiln feed elevator (ID No. ES CPA6)

1. **Description:** The Coloring Plant receives the raw granules sent from storage, and processes them into roofing granules. The granules are fed into a mixer where all of the coloring and other key additives are added and mixed together. This mixture is conveyed directly to process equipment where the ingredients are dried and heated to several hundreds of degrees Fahrenheit. As they are heated, all of the water is boiled off and the other constituents react on the granule surfaces, fusing to form a glassified silicaceous surface that seals and protects the roofing granule from effects of weather.

2. **Applicable Regulatory Requirements**: The Coloring Operations are **not subject** to 40 CFR Part 60, Subpart OOO.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate emissions	Work practice standards	15A NCAC 2D .0510
Visible emissions (For conveyors, screening operations, screen feeders, storage bins)	20 percent opacity	15A NCAC 2D .0521
Fugitive non-process particulate dust	Work practice standards	15A NCAC 2D .0540

a. **15A NCAC 2D .0510 "Particulates Form Sand, Gravel, or Crushed Stone Operations"**
The owner or operator of a sand, gravel, or crushed stone operation shall not cause, allow, or permit any material to be produced, handled, transported or stockpiled without taking measures to reduce to a minimum any particulate matter from becoming airborne to prevent exceeding the ambient air quality standards beyond the property line for particulate matter, both PM10 and total suspended particulates.
   i. Fugitive non-process dust emissions from sand, gravel, or crushed stone operations shall be controlled by Rule .0540 of this Section.
   ii. The owner or operator of any sand, gravel, or crushed stone operation shall control process-generated emissions:
      (A) from crushers with wet suppression, and
      (B) from conveyors, screens, and transfer points, such that the applicable opacity standards in Rule 15A NCAC 2D .0521 are not exceeded.

COLORING PLANT (LINES 1, 2, AND 3) – Continued

Note: The processes at this Roofing and Granuale facility that are located inside of the Coloring Building are dry operations, and do not employ wet suppression. These systems are enclosed and use baghouses to control emissions of particulate. The sources located outside of these building may employ wet suppression (pubmill, and waste stacker).

Uncontrolled emissions of PM-10 from the materials conveyors and screening operations listed above were determined from AP-42 Section 11.19.2 (1/95) for Crushed Stone Processing. TSP emissions were estimated based on the TSP to PM-10 ratio of 2.1 to 1 provided by AP-42. *These calculations were done in the original submittal (Permit No. 09006T00) for this facility.* Confidential process diagrams indicate that all conveyors are under negative pressure from one or more pick-ups which results in the collection of emissions at transfer points which have no pick-ups. The source list above goes beyond the application in that each transfer operation is depicted separately for compliance review rather than as a source group. Emissions estimates provided by the applicant remain relevant because AP-42 emission factors include transfer to and from the process as well as the process emissions.

Controlled emission factors were calculated using a fabric filter control efficiency of 99.92, a 97 percent emissions reduction for slate oil dust suppression, and a passive 99 percent control efficiency for enclosures. The fabric filter control systems were certified by David J. Heron, professional engineer temporarily licensed in the State of North Carolina, to achieve a maximum outlet grain loading of 0.01 grains per dry standard cubic foot.

Compliance is expected with this regulation for particulate emissions from the sources in the Coloring Building.

Monitoring/Recordkeeping/Reporting

iii. To assure compliance, the Permittee shall, meet the standards in accordance with 15A NCAC 2D .0521.

b. 15A NCAC 2D .0521 "Control Of Visible Emissions"

i. Visible emissions from the sources from this building shall not be more than **20 percent opacity** when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 2D .0521 (d)]

Testing [15A NCAC 2D .0501(c)(8)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(8) and General Condition JJ. If the results of this test are above the limit given in Section VII. A. 2. b. i. above in the Coloring Building, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521.

Monitoring [15A NCAC 2Q .0508(f)]

iii. To assure compliance, **once a month** the Permittee shall observe the emission points of this building for any visible emissions above normal. The Permittee shall establish "normal" for the source in the first 30 days following the effective date of the permit. If visible emissions from this source are observed to be above normal, the Permittee shall either: (a) be deemed to be in noncompliance with 15A NCAC 2D .0521 or (b) demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 2D .0501(c)(8) is below the limit given in Section VII. A. 2. b. i. above. If the demonstration in (b) above cannot be made, the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0521.

COLORING PLANT (LINES 1, 2, AND 3) – Continued

Reporting [15A NCAC 2Q .0508(f)]

iv. The Permittee shall submit a summary report of the observations by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

c. 15A NCAC 2D .0540 "Particulates From Fugitive Non Process Dust Emission Sources"

For the purpose of this Rule the following definitions shall apply:

i. "Fugitive non-process dust emission" means particulate matter that is not collected by a capture system and is generated from areas such as pit areas, process areas, haul roads, stockpiles, and plant roads.

ii. "Substantive complaints" means complaints that are verified with physical evidence acceptable to the Division.

iii. The owner or operator of a facility required to comply with rule 15A NCAC 2D .0510, Particulates from Sand, Gravel, or Crushed Stone Operations, shall not cause or allow fugitive non-process dust emissions to cause or contribute to substantive complaints.

iv. If fugitive non-process dust emissions from a facility required to comply with this Rule cause or contribute to substantive complaints, the owner or operator of the facility shall:

(A) within 30 days upon receipt of written notification from the Director of a second substantive complaint in a 12-month period, submit to the Director a written description of what has been done and what will be done to reduce fugitive non-process dust emissions from that part of the facility that caused the second substantive complaint;

(B) within 90 days of receipt of written notification from the Director of a second substantive complaint in a 12-month period, submit to the Director a control plan; and

(C) within 30 days after the Director approves the plan, be in compliance with the plan.

v. If after a plan has been implemented, the Director finds that the plan inadequately controls fugitive non-process dust emissions, he shall require the owner or operator of the facility to correct the deficiencies in the plan. Within 90 days after receiving written notification from the Director identifying the deficiency, the owner or operator of the facility shall submit a revision to his plan to correct the deficiencies.

Monitoring/Recordkeeping/Reporting

vi. No monitoring, recordkeeping, or Reporting is required at this time.

B. Three natural gas-fired dryers (30 million Btu per hour maximum heat input each, ID Nos. ES CPLA1, ES CPLB1, and ES CPA4, NSPS) with three associated baghouses (7,111 square feet of filter area each, ID Nos. CD-B9, CD-B10, and CD-B18, respectively)

1. **Description:** These natural gas-fired units are dryers by definition as listed in 40 CFR Part 60, Subpart UUU, because they are used to remove moisture from the crushed and screened granules of rock. They are not calciners. Also, since the exhaust gases from the dryers have a separated emission stack from the calciners that follow after the mixing units, these dryers are by definition not "in series" in accordance with 40 CFR Part 60, Subpart UUU, §60.731
2. **Applicable Regulatory Requirements**: These dryers are subject to 40 CFR Part 60, Subpart UUU "Standards of Performance for Calciners and Dryers in Mineral Industries" because they are located at a mineral processing plant and was constructed after April 23, 1986.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Particulate emissions	0.057 g/dscm	15A NCAC 2D .0524 **40 CFR Part 60, Subpart UUU**
Visible emissions	10 percent opacity	15A NCAC 2D .0524 **40 CFR Part 60, Subpart UUU**

COLORING PLANT (LINES 1, 2, AND 3) – Continued

a. 15A NCAC 2D .0516 "Sulfur Dioxide Emissions From Combustion Sources"

i. **Regulation Analysis:**
Sulfur dioxide emissions from dryers (ID Nos. ES CPLA1, ES CPLB1, and ES CPA4) that are discharged from any vent, stack, or chimney shall not exceed **2.3 pounds per million Btu heat input.**

Natural gas is inherently low in sulfur dioxide content. Potential emissions of sulfur dioxide **from the burning of natural gas** was estimated using the maximum heat input of the dryer AP-42 factors, Supplement E, revised 9/98, a heating value of 1030 Btu per million cubic feet of natural gas.

Emission factor for sulfur dioxide = 0.6 lbs SO_2 per million standard cubic feet
Heat content of natural gas = 1020 Btu per million cubic feet

$$\frac{0.6\,lbs\,SO_2}{1\times10^6\,cubic\ feet}\times\frac{1\,cubic\ feet}{1020\,Btu}\times\frac{1\times10^6\,Btu}{1.0\,mmBtu}=5.8\times10^{-4}\,\frac{lbs\,SO_2}{mmBtu}$$

Compliance is indicated for this dryer since the potential emissions of sulfur dioxide **(5.88 x 10^{-4} lbs SO_2)** are less than the allowable emissions of sulfur dioxide (**2.3 lbs SO_2 per million Btu heat input)**.

Testing [15A NCAC 2D .0501(c)(4)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(4) and General Condition JJ found in Section 3 of the Air Permit. If the results of this test are above the limit given in Section VII. B. 2. a. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas in dryers (ES CPLA1, ES CPLB1, and ES CPA4).

b. 15A NCAC 2D .0524, Subpart UUU "New Source Performance Standards For Calciners and Dryers in Mineral Industries"

i. For dryers (ID Nos. ES CPLA1, ES CPLB1, and ES CPA4), the Permittee shall comply with all applicable provisions, including the notification, testing, reporting, recordkeeping, and monitoring requirements contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards (NSPS)" as promulgated in 40 CFR Part 60 Subpart UUU, including Subpart A "General Provisions."[15A NCAC 2D .0524]

Emission Limitations [15A NCAC 2D .0524]

ii. Particulate matter emissions from each dryer (ID Nos. ES CPLA1, ES CPLB1, and ES CPA4) shall not exceed **0.057 gm/dscm**.

iii. Visible emissions from each dryer (ID Nos. ES CPLA1, ES CPLB1, and ES CPA4) shall not exceed **10 percent opacity**.

Particulate emission factors for the dryer were developed from emissions testing at the 3M Wausau facility. All particulate emissions are assumed to be PM-10. The test data was for controlled emissions and an estimated control efficiency of 99.9 percent for the Wausau fabric filter. The cyclone and fabric filter control for the proposed dryer are estimated to achieve an overall control efficiency of 99.96 percent (99.92 percent for the fabric filter and 50 percent for the cyclone). This is equal to approximately 0.01 grains per dry standard cubic foot. The fabric filter control system was certified by David J. Heron, who is a professional engineer temporarily licensed in the State of North Carolina. Compliance is expected for particulate emissions from this dryer.

COLORING PLANT (LINES 1, 2, AND 3) – Continued

Testing [15A NCAC 2D .0501(c)(8)]

iv. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ and 40 CFR Part 60, Subpart UUU, §60.736. If the results of this test are above the limit given in Section VII. B. 2. b. ii. and iii. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f)]

v. Under the provisions of NCGS 143-215.108, the Permittee shall demonstrate compliance with the emission limits in Section VII B. 2. b. ii. above in a performance test by testing dryer (ES-1415) for particulate emissions by utilizing EPA test method 5. The sampling time shall be and volume for each test run shall be at least 2 hours and 1.70 dscm. [40 CFR Part 60, Subpart UUU, §60.736]

The Permittee shall demonstrate compliance with the visible emissions limit in Section VII B. 2. b. iii. above by testing the dryer (ES 1415) for opacity by utilizing EPA test method 9. [40 CFR Part 60, Subpart UUU, §60.736]

The owner and operator of an affected facility subject to the provisions of this subpart who uses a dry control device to comply with the mass emission standard shall install, calibrate, maintain, and operate a continuous monitoring system to measure and record the opacity of emissions that are discharged into the atmosphere from the control device. [40 CFR Part 60, Subpart UUU, §60.734]

Records of monitoring shall be kept for a minimum of 5 years.

Reporting [15A NCAC 2Q .0508(f)]

vi. The Permittee shall submit a summary report of the monitoring requirements by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

C. Three natural gas-fired kilns (80 million Btu per hour maximum heat input each, ID Nos. ES CPLA3, ES CPLB3, and ES CPA7, NSPS) with three associated baghouses (11,111 square feet of filter area each, ID Nos. CDB13, CDB14, and CDB20, respectively)

1. **Description:** These natural gas-fired units are kilns used to boil the water off of the granules and to fuse the surface of the granules to form a glassified silicaceous surface that seals and protects the roofing granule from the effects of weather.
2. **Applicable Regulatory Requirements**: They **are not** subject to 40 CFR Part 60, Subpart UUU, §60.731 because coating kilns used in the roofing granules industry are specifically exempted in the Subpart from these requirements.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 opacity	15A NCAC 2D .0521
Particulate emissions	Submit Compliance Assurance Monitoring Plan	15A NCAC 2D .0614 **(CAM)**

a. 15A NCAC 2D .0516 "Sulfur Dioxide Emissions From Combustion Sources"

i. **Regulation Analysis:**

Sulfur dioxide emissions from the kilns (ID Nos. ES CPLA3, ES CPLB3, and ES CPA7) that are discharged from any vent, stack, or chimney shall not exceed **2.3 pounds per million Btu heat input.**

Natural gas is inherently low in sulfur dioxide content. Potential emissions of sulfur dioxide **from the burning of natural gas** was estimated using the maximum heat input of the dryer AP-42 factors, Supplement E, revised 9/98, a heating value of 1030 Btu per million cubic feet of natural gas.

Emission factor for sulfur dioxide = 0.6 lbs SO_2 per million standard cubic feet
Heat content of natural gas = 1020 Btu per million cubic feet

$$\frac{0.6\,lbs\,SO_2}{1\times10^6\,cubic\ feet}\times\frac{1\,cubic\ feet}{1020\,Btu}\times\frac{1\times10^6\,Btu}{1.0\,mmBtu}=5.8\times10^{-4}\,\frac{lbs\,SO_2}{mmBtu}$$

Compliance is indicated for this dryer since the potential emissions of sulfur dioxide **(5.88 x 10^{-4} lbs SO_2)** are less than the allowable emissions of sulfur dioxide (**2.3 lbs SO_2 per million Btu heat input)**.

Testing [15A NCAC 2D .0501(c)(4)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(4) and General Condition JJ found in Section 3 of the Air Permit. If the results of this test are above the limit given in Section VII. C. 2. a. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas in kilns (ESCPLA3, ESCPLB3, or ESCPA7).

b. 15A NCAC 2D .0521 "Control Of Visible Emissions"

i. Visible emissions from kilns (ID Nos. ES CPLA3, ES CPLB3, and ES CPA7) shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 2D .0521 (d)]

Testing [15A NCAC 2D .0501(c)(8)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(8) and General Condition JJ. If the results of this test are above the limit given in Section VII. C. 2. b. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521.

Monitoring/Recordkeeping/Reporting

iii. No monitoring, recordkeeping, or reporting is required for these kilns for visible emissions when firing natural gas.

c. 15A NCAC 2D .0614 "Compliance Assurance Monitoring"

A Compliance Assurance Monitoring (CAM) Plan was included with this application because these units (ID Nos. ES CPLA3, ES CPLB3, and ES CPA7) emit greater than 100 tons per year of particulate prior to control.

D. Three roof granule mixing units (ID Nos. ESCPLA2, ESCPLB2, and ESCPA5) with associated baghouses (2,889 square feet of filter area each, ID Nos. CDB11, CDB12, and CDB19, respectively)

1. **Description:** These units mix aggregate green stone, coloring slurry, and water. They are not subject to 40 CFR Part 60, Subpart OOO.
2. **Applicable Regulatory Requirements**: These units will be subject to 20 percent opacity.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate emissions	$E = 4.10 \times (P)^{0.67}$ for $P \leq 30$ tons per hour $E = 55.0 \times (P)^{0.11} - 40$ for $P \geq 30$ tons per hour	15A NCAC 2D .0515
	Submit compliance assurance monitoring **See Multiple Emissions Section VIII**	15A NCAC 2D .0614
Visible emissions	20 percent opacity	15A NCAC 2D .0521

a. **15A NCAC 2D .0515 "Particulates From Miscellaneous Industrial Processes"**

i. **Regulation Analysis**:

Emissions of particulate matter from this source shall not exceed an allowable emission rate as calculated by the following equation: [15A NCAC 2D .0515(a)]

$E = 4.10 \times P^{0.67}$ Where E = allowable emission rate in pounds per hour
P = process weight in tons per hour

$E = 55.0 \times P^{0.11}$ Where E = allowable emission rate in pounds per hour
P = process weight in tons per hour

Liquid and gaseous fuels and combustion air are not considered as part of the process weight.

There are no otherwise applicable particulate standards for this process. Therefore, the miscellaneous particulate regulation applies. Emissions are limited based on the input process weight rate.

Particulate emission factors for the mixers were developed from emissions testing at the 3M Wausau facility. All particulate emissions are assumed to be PM-10. The test data was for controlled emissions and an estimated control efficiency of 99.9 percent for the Wausau fabric filter. The fabric filter control for the proposed mixers are estimated to achieve an overall control efficiency of 99.92 percent. The fabric filter control system was certified by David J. Heron, who is a professional engineer temporarily licensed in the State of North Carolina, to achieve an outlet grain loading of 0.01 grains per dry standard cubic foot. Compliance is expected for particulate emissions from the mixing units.

The hourly process weight rate for each unit is held as confidential, and the compliance with this regulation for the mixers (ID Nos. Nos. ESCPLA2, ESCPLB2, and ESCPA5) was submitted per letter dated April 13, 2001. The results of the analysis demonstrated that particulate emissions would comply with the allowable emissions.

Testing [15A NCAC 2D .0501 (c)(3)]

ii. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limit given in Section VII. D. 2. a. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f)]

iii. Particulate matter emissions from the mixing units (ID Nos. ESCPLA2, ESCPLB2, and ESCPA5) shall be controlled by bagfilters (ID Nos. CD B11, CD B12, and CD B19). To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations, or if there is no manufacturer's inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:

(A) an annual visual inspection of the system ductwork and material collection unit for leaks; and

(B) an annual (for each 12 month period following the initial inspection) internal inspection of the bagfilter's structural integrity.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if the ductwork and bagfilters are not inspected and maintained.

iv. The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:

i. the date and time of each recorded action;
ii. the results of each inspection;
iii. the results of any maintenance performed on the bagfilters; and
iv. any variance from manufacturer's inspection and maintenance recommendations, if any, and corrections made.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if these records are not maintained.

Reporting [15A NCAC 2Q .0508(f)]

v. The Permittee shall submit the results of any maintenance performed on the bagfilters within 30 days of a written request by the DAQ.

vi. The Permittee shall submit a summary report of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

b. 15A NCAC 2D .0614 "Compliance Assurance Monitoring"

A Compliance Assurance Monitoring (CAM) Plan was included with this application because these units (ID Nos. ES CPLA2, ES CPLB2, and ES CPA5) emit greater than 100 tons per year of particulate prior to control.

c. 15A NCAC 2D .0521 "Control Of Visible Emissions"

i. Visible emissions from mixers (ID Nos. ES CPLA2, ES CPLB2, and ES CPA5) shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 2D .0521 (d)]

COLORING PLANT (LINES 1, 2, AND 3) – Continued

Testing [15A NCAC 2D .0501(c)(8)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(8) and General Condition JJ. If the results of this test are above the limit given in Section VII. D. 2. c. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521.

Monitoring [15A NCAC 2Q .0508(f)]

iii. To assure compliance, **once a month**, the Permittee shall observe the emission points of this source for any visible emissions above normal. The Permittee shall establish "normal" for the source in the first 30 days following the effective date of the permit. If visible emissions from this source are observed to be above normal, the Permittee shall either:
   i. take appropriate action to correct the above-normal emissions within the monitoring period and record the action taken as provided in the recordkeeping requirements below, or
   ii. demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 2D .0501(c)(8) is below the limit given in Section VII. D. 2. c. i. above.

   If the above-normal emissions are not corrected per (i) above or if the demonstration in (ii) above cannot be made, the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0521.

Recordkeeping [15A NCAC 2Q .0508(f)]

iv. The results of the monitoring shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
   (A) the date and time of each recorded action;
   (B) the results of each observation and/or test noting those sources with emissions that were observed to be in noncompliance along with any corrective actions taken to reduce visible emissions; and
   (C) the results of any corrective actions performed.

   The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521 if these records are not maintained**.**

Reporting [15A NCAC 2Q .0508(f)]

v. The Permittee shall submit a summary report of the observations postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

E. Three coolers (ID Nos. ES CPC1, ES CPC2, and ES CPA8)

1. **Description:** The hot roofing granules are expelled from the kilns and sent to the cooler. At the cooler, water and treatment additives are added to cool the granules quickly and to aid loading for transport. The cooled granules are next transported to finished granule storage and eventually to truck loaders.

2. **Applicable Regulatory Requirements**: These units will be subject to 20 percent opacity.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate emissions	$E = 4.10 * (P)^{0.67}$ for $P \leq 30$ tons per hour $E = 55.0 * (P)^{0.11} - 40$ for $P \geq 30$ tons per hour	15A NCAC 2D .0515
Visible emissions	20 percent opacity	15A NCAC 2D .0521

a. 15A NCAC 2D .0515 "Particulates From Miscellaneous Industrial Processes"

i. **Regulation Analysis**:

Emissions of particulate matter from this source shall not exceed an allowable emission rate as calculated by the following equation: [15A NCAC 2D .0515(a)]

$E = 4.10 \times P^{0.67}$ Where E = allowable emission rate in pounds per hour
P = process weight in tons per hour

$E = 55.0 \times P^{0.11}$ Where E = allowable emission rate in pounds per hour
P = process weight in tons per hour

Liquid and gaseous fuels and combustion air are not considered as part of the process weight.

There are no otherwise applicable particulate standards for this process. Therefore, the miscellaneous particulate regulation applies. Emissions are limited based on the input process weight rate.

Particulate emission factors for the coolers were developed from emissions testing at the 3M Wausau facility. All particulate emissions are assumed to be PM-10.

The hourly process weight rate for each unit is held as confidential, and the compliance with this regulation for the coolers (ID Nos. ES CPC1, ES CPC2, and ES CPA8) was submitted per letter dated April 13, 2001. The results of the analysis demonstrated that particulate emissions would comply with the allowable emissions.

Testing [15A NCAC 2D .0501 (c)(3)]

ii. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limit given in Section VII. E. 2. a. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515.

iii. **Monitoring/Recordkeeping/Reporting** [15A NCAC 2Q .0508(f)]

The Permittee shall maintain records that specify the amount of materials processed and shall make these records available to a DAQ authorized representative upon request. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if the records are not maintained.

b. 15A NCAC 2D .0521 "Control of Visible Emissions"

i. Visible emissions from the cooling units (ID Nos. ES CPC1, ES CPC2, and ES CPA8) shall not be more than **20 percent opacity** when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 2D .0521 (d)]

This standard allows no than 20 percent opacity due to visible emissions. The coolers have low emissions and should meet the opacity requirements. However the coolers will emit a large amount of steam that may interfere with the visible emission determination.

Testing [15A NCAC 2D .0501(c)(8)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(8) and General Condition JJ. If the results of this test are above the limit given in Section VII. E. 2. b. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521.

Monitoring [15A NCAC 2Q .0508(f)]

iii. To assure compliance, **once a month**, the Permittee shall observe the emission points of this source for any visible emissions above normal. The Permittee shall establish "normal" for the source in the first 30 days following the effective date of the permit. If visible emissions from this source are observed to be above normal, the Permittee shall either:
   (A) take appropriate action to correct the above-normal emissions within the monitoring period and record the action taken as provided in the recordkeeping requirements below, or
   (B) demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 2D .0501(c)(8) is below the limit given in Section VII. E. 2. b. i. above.

   If the above-normal emissions are not corrected per (A) above or if the demonstration in (B) above cannot be made, the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0521.

Recordkeeping [15A NCAC 2Q .0508(f)]

iv. The results of the monitoring shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
   (A) the date and time of each recorded action;
   (B) the results of each observation and/or test noting those sources with emissions that were observed to be in noncompliance along with any corrective actions taken to reduce visible emissions; and
   (C) the results of any corrective actions performed.

   The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521 if these records are not maintained**.**

Reporting [15A NCAC 2Q .0508(f)]

v. The Permittee shall submit a summary report of the observations postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

VIII. Multiple Emissions:

Facility Wide Toxics Air Pollutants

A. 15A NCAC 2D. 0711 "Emission Rates Requiring A Permit"

Facility wide emissions of toxic air pollutants were calculated based on worst case additives and include toxic air pollutants from natural gas combustion in direct contact units. Trace elements in the additives include arsenic, cadmium, mercury, and nickel compounds. Combustion TAPs are exempt from toxic evaluation per 15NCAC 2Q .0702 at this time. Nickel was addressed; however, these are most likely non-soluble compounds contained as trace elements in the greenstone and color plant additives. In addition, trace manganese, a basic element of the greenstone, was not considered subject to toxic air pollutant regulations and evaluation was not required for this source.

VIII. Multiple Emissions: (Continued)

Facility Wide Toxics Air Pollutants

Pollutant	Potential Emission	TPER
Arsenic (7440-38-2)	0.0092 lbs/yr	0.016 lbs/yr
Cadmium (7440-43-9)	0.0005 lbs/yr	0.37 lbs/yr
Chromium (744-47-3)	15.2451 lbs/yr	None
Formaldehyde (50-00-0)	0.0002 lb/yr	0.04 lbs/hr (350.4 lbs/yr)*
Lead	0.0103 lbs/yr	None
Manganese compounds	0.009 lbs/day (3.1884 lbs/yr)	0.63 lbs/day (229.95 lbs/yr)*
Methanol (upon hydrolysis)	0.0011 lbs/yr	None
Nickel metal (7440-02-0)	0.0107 lbs/yr	0.13 lbs/day (47.45 lbs/yr) *

* TPER values listed in (lbs/yr) only because that is the way the applicant submitted them.

Facility wide emissions of each of these seven pollutants are less than each respective TPER. The applicant has stated that there will be no fluoride compound, hydrogen fluoride, chlorine, or hydrogen chloride emissions from the facility.

IX. PSD

This facility is a minor source for PSD. However, the minor source baseline has been triggered in Chatham County for PM_{10}, SO2, and NOx.

Sources of PM_{10} emissions in the future Crushing and Coloring Line 3 as listed in the permit.

- D Screen #4 assembly (includes the vibrator, ID No. ES-A1)
- G bin feed conveyor #6 loadout to bin feed conveyor #6A (ID No. ES A2)
- G 60 ton feed bin #3 (ES A3)
- G crusher #3 (ES A4)
- Load-in to 54 inch conveyor #18C (ID No. ES A5)
- Line #3 live M feed bin (ID No. ES A6)
- Line #3 M Screen Assemblies (ID No. ES-A7)
- 90 ton feed bin #3 (ID No. ES A8)
- L crusher #3 (ES A9)
- 11 Grade 1500 ton silo #3 (ID No. ES A10)
- Screen baghouse #3 ash loadout (ID No. ES A11)
- Crusher baghouse #3 ash loadout (ID No. ES A12)

- Raw granule transfer conveyor (RGTC) load-in to raw granule transfer conveyor 4 (ID No. ES CPA1)
- 75 ton raw granule bin #3 (RRB3, ID NO. ES CPA2)
- 55 ton rerun bin #3(RRB3, ES CPA3)
- One natural gas-fired dryer (30 million Btu per hour maximum heat input, ES CPA4)
- One granule mixing unit (ID No. ES CPA5)
- Kiln feed elevator 3 (KFE3, ID No. ES CPA 6)
- One natural gas-fired kiln/calciner (80 million Btu per hour maximum heat input, ID No. ES CPA7)
- Cooler #3 (C3, ID No. ES CPA8)
- Line #3 product elevator #9, product and blend bins (ID No. ES CPA9)
- R screen for line #3 (ROT4, ES CPA10)
- Product conveyor #1 and #2 loadouts to railcars (ID No. F-CPA11)

Calculations were done using stack test data; AP-42 factors, tables 1.4-2 for natural gas-fired combustion sources, table 11.6-2 for kiln and dryer, table 13.2.4-3 for the conveyors (F-CPA11) and table 11.19.2-2 for the other sources.

ID No.	Description	AP-42 factor	Control eff.	Emissions (lbs/hr)
ES A1	D screen #4 assembly	0.015 lbs PM_{10}/ton	99.92%	0.0052 lbs PM_{10}/hr
ES A2	G bin feed conveyor # 6	.0014lbs PM_{10}/ton	99.92%	0.0003 lbs PM_{10}/hr
ES A3	G 60 ton feed bin #3	.0028 lbs PM_{10}/ton	99.92%	0.0007 lbs PM_{10}/hr
ES A4	G crusher #3	.0024 lbs PM_{10}/ton	99.92%	0.0006 lbs PM_{10}/hr
ES A5	Load-in to 54 inch conveyor #18C	.0014 lbs PM_{10}/ton	99.92%	0.0004 lbs PM_{10}/hr
ES A6	Line #3 live M feed bin	.0014 lbs PM_{10}/ton	99.92%	0.000 lbs PM_{10}/hr
ES A7	Line #3 M screen assemblies	0.015 lbs PM_{10}/ton	99.92%	0.0045 lbs PM_{10}/hr
ES A8	90 ton feed bin #3	.0028 lbs PM_{10}/ton	99.92%	0.0005lbs PM_{10}/hr
ES A9	L crusher #3	.0024 lbs PM_{10}/ton	99.92%	0.0005lbs PM_{10}/hr
ES A10	11 grade 1500 ton silo #3	.0028 lbs PM_{10}/ton	99.92%	0.0005 lbs PM_{10}/hr
ES A11	Screen baghous #3 ash loadout	.0014 lbs PM_{10}/ton	99.92%	0.000 lbs PM_{10}/hr
ES A12	Crusher baghouse #3 ash loadout	.0014 lbs PM_{10}/ton	99.92%	0.000 lbs PM_{10}/hr
ES CPA1	Raw granule transfer conveyor	.0028 lbs PM_{10}/ton	99.92%	0.0007 lbs PM_{10}/hr
ES CPA2	75 ton raw granule bin #3	.0014 lbs PM_{10}/ton	99.92%	0.0002 lbs PM_{10}/hr
ES CPA3	55 ton rerun bin #3	.0028 lbs PM_{10}/ton	99.92%	0.000 lbs PM_{10}/hr
ES CPA4	Kiln/Calciner #3, 80 mmBtu/hr	7.69 lbs PM_{10}/ton	99.92%	1.14 lbs PM_{10}/hr *
ES CPA5	Granule mixing unit	8.3 lbs PM_{10}/ton	99.92%	1.0 lbs PM_{10}/hr
ES CPA6	Kiln feed elevator 3	.0028 lbs PM_{10}/ton	99.92%	0.0003 lbs PM_{10}/hr
ES CPA7	Line #3, dryer 30 mmBtu/hr	16.32 lbs PM_{10}/ton	99.92%	2.56 lbs PM_{10}/hr **
ES CPA8	Cooling unit	0.028 lbs PM_{10}/ton	None	4.21 lbs PM_{10}/hr
ES CPA9	Line #3 product elevator #9, product and blend bins	.0028 lbs PM_{10}/ton	99.92%	0.0003 lbs PM_{10}/hr
ES CPA10	R screen for line #3	0.015 lbs PM_{10}/ton	99.92%	.0018 lbs PM_{10}/hr
F-CPA11	Product conveyor #1 and #2	0.044 lbs PM_{10}/ton	None	2.0 lbs PM_{10}/hr
			Total	10.94 PM_{10}/hr

* This emission rate includes 0.22 lbs PM per hour due to the combustion of natural gas in this unit.
** This emission rate includes 0.60 lbs PM per hour due to the combustion of natural gas in this unit.

*For PSD increment tracking purposes, **PM_{10}** emissions from this modification are increased by **10.94** pounds per hour.*

Sources of sulfur dioxide emissions in the future Coloring Building as listed in the permit.

- One natural gas-fired dryer (30 million Btu per hour maximum heat input, ESCPA4) with associated baghouse (7,111 square feet of filter area each, ID No. CD-B18, respectively)
- One natural gas-fired kiln/calciner (80 million Btu per hour maximum heat input, ID No. ESCPA7) with associated baghouse (11,111 square feet of filter area each, ID Nos. CDB20)

Example calculation:

$$\frac{0.6\ lbs\ SO_2}{million\ scf} \times \frac{1\ scf}{1030\ Btu} \times \frac{80\ million\ Btu}{hour} = \frac{0.047\ lbs\ SO_2}{hour}$$

ID No.	Description	AP-42 factor	Control eff.	Emissions (lbs/hr)
ES-CPA7	Kiln/Calciner #3, 80 mmBtu/hr	0.6 lbs SO_2/mmscf	None	0.047 lbs SO_2/hour
ES-CPA4	Line #3, dryer 30 mmBtu/hr	0.6 lbs SO_2/mmscf	None	0.018 lbs SO_2/hour
Total				0.065 lbs SO_2/hour

Since the increase in SO_2 emissions is less than one pound per hour, this will not be listed in the cover letter of the permit.

Sources of nitrogen dioxide emissions in the future Coloring Building as listed in the permit.

- One natural gas-fired dryer (30 million Btu per hour maximum heat input, ESCPA4) with associated baghouse (7,111 square feet of filter area each, ID No. CD-B18, respectively)
- One natural gas-fired kiln/calciner (80 million Btu per hour maximum heat input, ID No. ESCPA7) with associated baghouse (11,111 square feet of filter area each, ID Nos. CDB20)

Example calculation:

$$\frac{100\ lbs\ NO_X}{million\ scf} \times \frac{1\ scf}{1030\ Btu} \times \frac{80\ million\ Btu}{hour} = \frac{7.843\ lbs\ NO_X}{hour}$$

ID No.	Description	AP-42 factor	Control eff.	Emissions (lbs/hr)
ES-CPA7	Kiln /Calciner #3, 80 mmBtu/hr	100 lbs NOx/mmscf	None	7.843 lbs NOx/hr
ES-CDA4	Line #3, dryer 30 mmBtu/hr	100 lbs NOx/mmscf	None	2.941 lbs NOx/hr
Total				10.78 lbs NOx/hr

*For PSD increment tracking purposes, **NOx** emissions from this modification are increased by **10.78** pounds per hour.*

X. **Consistency Determination** - A consistency determination is required for this 1st Time Title V /Modification application. A consistency determination letter from Mr. Keith Megginson, Planning Director for Chatham County was included with the application. This portion of property exists where the Chatham County Subdivision Regulations are applicable, however, the proposal does not constitute a subdivision of land. Therefore, the proposed use is consistent with the Chatham County Subdivision Regulations. This property is located in an unzoned portion of Chatham County.

XI. **Public Notice**

Pursuant to 15A NCAC 2Q .0521, a notice of the draft Title V Operating Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30-day comment period, with an opportunity for a public hearing, followed by a 45-day comment period by the EPA. Copies of the public notice shall be sent to persons on the Title V mailing list, and the EPA.

Update: The public notice for this facility was published in the _____ on _____2004. The 30 day public comment period lasted from _____ until _____2004. ____ public comments were received by the DAQ. The review, permit and other pertinent information shall now be sent to the EPA, Region IV for a 45-day comment period.

Update: The EPA 45-day comment period ended on _____2004. The DAQ _____receive _____ comments from EPA Region IV.

XII. **Insignificant Activities**

Due to recent Regulation changes, the Title V permit application was updated to comply with the new regulations for insignificant activities at a Title V facility. Title V facilities are no longer allowed to use the exemptions listed in 15A NCAC 2Q .0102(b)(1 and 2). Instead they must use the exemptions listed in 15A NCAC 2Q .0503 (7 and 8). The insignificant activities listed in the cover letter are in accordance with 15A NCAC 2D .0503(8) {less than 5 tons/year of criteria pollutant and less than 1000 pounds of HAPs}.

XIII. **Professional Engineers Seal** - A professional engineers seal from Mr. David J. Herron was provided with this application.

XIV. 15A NCAC 2Q .0508(g): Prevention Of Accidental Releases - Section 112 (r) Of The Clean Air Act

This facility is not subject to Section 112(r), 40 CFR Part 68 [15A NCAC 2Q .0508(g)] of the Federal Clean Air Act since it does not store any of the regulated substances in quantities above the threshold limits in this rule.

XV. Recommendations

This application for a 1st Time Title V permit for 3M Industrial Mineral Products, 3M Roofing Granule Manufacturing Operations, in Moncure, North Carolina has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2D. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the draft permit with all applicable requirements. Therefore, the DAQ is proposing to issue this proposed Permit upon completion of the public comment period and the EPA review period.

A Part II Permit will be added to the back of the Title V Operating Permit for all sources that have not already been constructed or included in the State Permit which have been issued.