Air Quality Permitting
Technical Analysis

Tier II Operating Permit and Permit to Construct
No. 045-00003

UNIMIN CORPORATION
EMMETT, IDAHO

Prepared By:

Kent Berry
Environmental Quality Management, Inc.

Mike Simon
Facility operations Coordinator

Project No. T2-010033

Date Prepared:

September 5, 2002

Permit Status:

FINAL

TABLE OF CONTENTS

LIST OF ACRONYMS 3
PURPOSE 4
PROJECT DESCRIPTION 4
FACILITY DESCRIPTION 5
SUMMARY OF EVENTS 5
PERMIT HISTORY 5
DISCUSSION 5
FEES 8
RECOMMENDATIONS 8
APPENDIX 9

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
BACT	Best Available Control Technology
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department Of Environmental Quality
ft.	feet
gr/dscm	grains per dry standard cubic meter
HAPS	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pound per hour
MACT	Maximum Achievable Control Technology
mg/m^3	milligrams per cubic meter
MMBtu/hr	million British thermal units per hour
NESHAP	National Emission Standards For Hazardous Air Pollutants
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	prevention of significant deterioration
PTC	permit to construct
SIP	State Implementation Plan
SM	synthetic minor
SO_2	sulfur dioxide
T/hr	tons per hour
T/yr	tons per year
VOC	volatile organic compound

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01, 404.04, *Rules for the Control of Air Pollution in Idaho,* for Tier II operating permits.

PROJECT DESCRIPTION

Unimin Corp. (Unimin) located in Emmett, Idaho, has requested renewal of their Tier II operating permit originally issued August 26, 1996, and amended May 5, 1999. The emissions sources at the facility are as follows.

Table 1.1 EMISSION SOURCES

Permit Sections	Source Description	Emission Controls
3	Dryer DR-01, Starkaire 10' diameter, with North American gas burner; installed before 9/23/83	Wet scrubber DC-03 BACT model ME-V21
4	Vibrating screens VS-10 and VS-11, Derrick model K48-96A-3SM Screw conveyors SC-03 and SC-04 Bucket elevators BE-01, BE-02, and BE-03; installed before 9/23/83 Screen VS-14, Derrick model K48-120A-2S; installed after 6/3/97	Wet scrubber DC-01, BACT model MEV-12, 12,000 acfm
4	Coarse screens VS-01 and VS-02, Derrick model 48-96A-3SM; installed before 4/28/67 Coarse screens VS-03 and VS-04, Derrick model 48-96A-2S; installed 5/2/67 Coarse screen VS-05, Derrick model K-48-120A-2S; installed 5/2/67 Coarse screen VS-06, Derrick model K24-48A-2S Coarse screens VS-07 and VS-08, Derrick model K48-120A-3SM; installed 4/17/86 Coarse screen VS-09, Derrick model K48-96A-2S, 4 ft. x 8 ft. , installed 1/16/70 Bucket elevators BE-04 and BE-05, respectively; installed before 9/23/83 Bins BN-01 to BN-11; installed before 9/23/83 Belt conveyors BC-05, BC-06, and BC-10; installed before 9/23/83 Screw conveyors SC-05, SC-06, SC-07, and SC-08	Wet scrubber DC-02, Riley model A-33-14
4	Sand baggers BA-01 and BA-02, St. Regis Jr. Force Flow; installed before 9/23/83 Sand bagger BA-03, Unimin; installed before 9/23/92 Belt conveyors BC-06 and BC-07; installed before 9/23/83 Hoppers HO-05 and HO-06, Loading Spout LS-04, installed before 9/23/83	Wet scrubber DC-04, BACT model ME-V006, 6,000 acfm
5	Rod mill RM-01, Allis Chalmers, installed 12/31/88 Cam Belt CB-01 and Belt conveyor BC-12, installed 12/1/86 and before 1990, respectively	None
6	Hoppers HO-01 and H0-03, Feeder FE-01, and Cam Belt CB-01 (see above); installed before 9/23/83 Rod mill RM-01 (see above) Screens VS-12 and VS-13 Hopper HO-02, Screw conveyors SC-01 and SC-02, and Belt conveyor BC-02; all installed before 9/23/83	None
7	Hoppers HO-05 and HO-04, Belt conveyors BC-07 and BC-11 and all installed before 9/23/83	None
2	Stockpiles and roads	Reasonable Controls

FACILITY DESCRIPTION

The description of this facility and the equipment regulated in the permit have not changed since the latest revision of the Tier II operating permit in 1999. For facility and equipment descriptions, refer to the technical memorandum dated May 5, 1999, by Thomas Lundahl, DEQ Air Quality Engineer.

SUMMARY OF EVENTS

August 23, 2001	DEQ received a request from Unimin for renewal of their Tier II operating permit which expired August 26, 2001.
January 15, 2002	Unimin submitted the results of a particle-size analysis of the facility feed material to support site-specific PM_{10} emission estimates for the facility. Unimin requested the information be included in the renewal of the Tier II permit.
February 27, 2001	Unimin submitted revised estimates of PM_{10} emissions and requested that the permit be revised to allow burning of No. 2 oil in the dryer.
February 28, 2002	DEQ deemed the application complete.
April 4, 2002	DEQ issued a facility draft Tier II for review.
April 15, 2002	DEQ received comments from Unimin Corp. on the draft Tier II permit.
May 17, 2002	DEQ issued a proposed Tier II permit for public comment.
June 28, 2002	The public comment period closed. DEQ received comments from Unimin on the proposed permit. Responses to these comments have been prepared.

PERMIT HISTORY

The following is a summary of the permit files available to Environmental Quality Management.

August 26, 1996	The original Tier II operating permit was issued for the facility.
June 3, 1997	PTC No. 045-00003 was issued for new vibrating screen, VS-14.
May 5, 1999	The Tier II operating permit was revised to incorporate new emission factors that lowered the potential emissions of PM from 99.3 T/yr to 52.4 T/yr.

DISCUSSION

1. Emissions Estimates

Except for PM_{10}, the emission calculations from sand handling have not changed since the revision of the Tier II operating permit on May 5, 1999. For emission estimate information for this facility, refer to the technical memorandum dated May 5, 1999, from Thomas Lundahl, DEQ Air Quality Engineer. Emission estimates for burning No. 2 oil in the dryer, along with the resulting ambient concentrations, are presented below. Based on the particle size information for the feed materials, it appears the wet flotation processing of the sand removes most of the fine particles, and thus the PM_{10} emissions are very small.

2. Modeling

The only emission changes requiring new modeling involve SO_2 and NO_x from burning No. 2 fuel oil. The potential emissions and the resulting ambient concentrations are presented below.

Table 1.2 POTENTIAL EMISSIONS

	Potential Emissions*		Maximum Ambient Concentration (ug/m^3)		
Pollutant	lb/hr	T/yr	3 hr	24 hr	Annual
SO_2	10.2	44.6	81.4	46.5	9.3
NO_x	2.87	12.6			2.6

*Based on AP-42, Table 1.3-1; S = 0.5%.

The SCREEN3 output file is shown in the appendix.

3. Area Classification

Unimin is located near Emmett in Gem County, which is in AQCR 63. Gem County is classified as attainment or unclassifiable for all state and federal criteria air pollutants.

4. Facility Classification

The plant is not a major facility as defined in IDAPA 58.01.01.006.55 or 008.10. It is not a designated facility as defined in IDAPA 58.01.01.006.27. The facility is classified as a SM source because actual and potential emissions of regulated air pollutants are less than 100 T/yr only if it complies with the federally-enforceable emission limits in the permit.

5. Regulatory Review

This operating permit is subject to the following permitting requirements:

a. IDAPA 58.01.01.401 — Tier II Operating Permit
b. IDAPA 58.01.01.403 — Permit Requirements for Tier II Sources
c. IDAPA 58.01.01.404.01(c) — Opportunity for Public Comment
d. IDAPA 58.01.01.404.04 — Authority to Revise or Renew Operating Permits
e. IDAPA 58.01.01.406 — Obligation to Comply
f. IDAPA 58.01.01.470 — Permit Application Fees for Tier II Permits
g. IDAPA 58.01.01.625 — Visible Emission Limitation
h. IDAPA 58.01.01.650 — General Rules for the Control of Fugitive Dust
i. 40 CFR Part 60, Subpart OOO — Standards of Performance for Non-metallic Mineral Processing Plants

6. Permit Conditions

Based on the particle size information discussed above, the emission limits for PM_{10} have been deleted.

The Tier II permit has been combined with existing Permits to Construct into one permit. The permit therefore has been updated to reflect the Tier II/PTC.

At the facility's request, a limit on the amount of fuel oil combusted in the dryer has been added.

The permit has also been revised to address the requirements of 40 CFR Part 60, Subpart OOO much more completely. Based on the construction dates of the equipment, Dust Collectors DC-01, DC-02, and DC-04 control equipment subject to Subpart OOO. The affected sources are VS-14 (vented to DC-01), VS-07 and VS-08 (vented to DC-02), and BA-03 (vented to DC-04). These scrubbers are subject to an emission limit of 0.05 g/dscm and are exempt from opacity requirements per 60.672(a)(2). A source test for DC-02 has been conducted, but no test has apparently been conducted on DC-01 or DC-04 to demonstrate compliance with the 0.05 g/dscm limit; thus, the permit requires a source test for these scrubbers pursuant to IDAPA 58.01.01.405. Three fugitive sources are subject to Subpart OOO, and are thus subject to an opacity limit of 10%.

The permit has also been revised with respect to Section 8 of the proposed permit that went out to public comment. In the final permit, Section 8 covering Stockpiles and plant roads was deleted. These fugitives sources are covered in the facility-wides conditions contained in Section 2.

7. AIRS

AIRS/AFS FACILITY-WIDE CLASSIFICATION* DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2	B						A
NO_x	B						U
CO	B						U
PM_{10}	B						U
PM (Particulate)	SM		SM				A
VOC	B						U
THAP (Total HAPs)	NA						NA
			APPLICABLE SUBPART				
			OOO				

Aerometric Information Retrieval System Facility Subsystem

* AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.470. The facility has paid the required $500 fee.

RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends DEQ issue a final Tier II operating permit and Permit to Construct to Unimin Corp. An opportunity for public comment on the air quality aspects of the proposed operating permit was provided in accordance with IDAPA 58.01.01.404.01.c.

KB/MS:bh
Project #T2-010033 G:\AIR QUALITY\STATIONARY SOURCE\SS LTD\T2\UNIMIN\FINAL PREP\T2-010033 TECH MEMO.DOC

cc: Kent Berry, EQM
Michael McGown, Boise Regional Office
Joan Lechtenberg, Air Quality Division

APPENDIX

SCREEN3 OUTPUT FILE

03/12/02
16:03:07

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Unimin Stack Emissions

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	11.2776
STK INSIDE DIAM (M)	=	0.4298
STK EXIT VELOCITY (M/S)	=	68.3213
STK GAS EXIT TEMP (K)	=	418.2333
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	9.1440
MIN HORIZ BLDG DIM (M)	=	20.4216
MAX HORIZ BLDG DIM (M)	=	36.2712

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 9.254 M**4/S**3; MOM. FLUX = 151.097 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	124.00	4.43	4.41	NO
100.	11.43	4	15.0	15.3	4800.0	11.77	8.20	7.10	SS
200.	7.845	4	15.0	15.3	4800.0	12.67	15.56	10.78	SS
300.	6.234	4	10.0	10.2	3200.0	16.00	22.61	12.80	SS
400.	5.071	4	10.0	10.2	3200.0	16.00	29.45	15.94	SS
500.	4.244	4	8.0	8.1	2560.0	19.40	36.15	18.30	SS
600.	3.577	4	8.0	8.1	2560.0	19.40	42.72	21.21	SS
700.	3.025	4	5.0	5.1	1600.0	30.20	49.19	24.03	SS
800.	2.802	4	5.0	5.1	1600.0	30.20	55.57	26.78	SS
900.	2.594	4	4.5	4.6	1440.0	32.69	61.88	29.47	SS
1000.	2.417	4	4.0	4.1	1280.0	35.81	68.13	32.09	SS
1100.	2.239	4	4.0	4.1	1280.0	35.81	74.31	34.12	SS
1200.	2.074	4	4.0	4.1	1280.0	35.81	80.44	36.09	SS
1300.	1.921	4	4.0	4.1	1280.0	35.81	86.52	38.00	SS
1400.	1.783	4	4.0	4.1	1280.0	35.81	92.55	39.86	SS
1500.	1.658	4	4.0	4.1	1280.0	35.81	98.54	41.67	SS
1600.	1.553	4	3.0	3.1	960.0	48.49	105.03	44.72	NO
1700.	1.490	5	1.0	1.0	10000.0	72.82	84.43	34.97	NO
1800.	1.547	5	1.0	1.0	10000.0	72.82	88.73	35.93	NO

1900.	1.596	5	1.0	1.0	10000.0	72.82	93.02	36.88	NO
2000.	1.638	5	1.0	1.0	10000.0	72.82	97.30	37.82	NO
2100.	1.662	5	1.0	1.0	10000.0	72.82	101.56	38.66	NO
2200.	1.681	5	1.0	1.0	10000.0	72.82	105.81	39.49	NO
2300.	1.696	5	1.0	1.0	10000.0	72.82	110.04	40.31	NO
2400.	1.706	5	1.0	1.0	10000.0	72.82	114.25	41.12	NO
2500.	1.712	5	1.0	1.0	10000.0	72.82	118.45	41.91	NO
2600.	1.715	5	1.0	1.0	10000.0	72.82	122.64	42.69	NO
2700.	1.715	5	1.0	1.0	10000.0	72.82	126.81	43.47	NO
2800.	1.712	5	1.0	1.0	10000.0	72.82	130.97	44.23	NO
2900.	1.707	5	1.0	1.0	10000.0	72.82	135.12	44.99	NO
3000.	1.702	6	1.0	1.1	10000.0	61.94	93.06	30.61	NO
3500.	1.747	6	1.0	1.1	10000.0	61.94	106.64	32.39	NO
4000.	1.758	6	1.0	1.1	10000.0	61.94	120.05	34.06	NO
4500.	1.746	6	1.0	1.1	10000.0	61.94	133.29	35.64	NO
5000.	1.719	6	1.0	1.1	10000.0	61.94	146.39	37.14	NO
5500.	1.683	6	1.0	1.1	10000.0	61.94	159.35	38.58	NO
6000.	1.640	6	1.0	1.1	10000.0	61.94	172.19	39.95	NO
6500.	1.595	6	1.0	1.1	10000.0	61.94	184.93	41.27	NO
7000.	1.548	6	1.0	1.1	10000.0	61.94	197.52	42.54	NO
7500.	1.496	6	1.0	1.1	10000.0	61.94	210.04	43.63	NO
8000.	1.445	6	1.0	1.1	10000.0	61.94	222.46	44.69	NO
8500.	1.397	6	1.0	1.1	10000.0	61.94	234.79	45.71	NO
9000.	1.350	6	1.0	1.1	10000.0	61.94	247.03	46.70	NO
9500.	1.306	6	1.0	1.1	10000.0	61.94	259.20	47.66	NO
10000.	1.264	6	1.0	1.1	10000.0	61.94	271.29	48.59	NO
15000.	0.9381	6	1.0	1.1	10000.0	61.94	388.70	56.76	NO
20000.	0.7335	6	1.0	1.1	10000.0	61.94	501.16	62.01	NO
25000.	0.5999	6	1.0	1.1	10000.0	61.94	609.92	66.45	NO
30000.	0.5060	6	1.0	1.1	10000.0	61.94	715.73	70.34	NO
40000.	0.3852	6	1.0	1.1	10000.0	61.94	920.34	75.88	NO
50000.	0.3104	6	1.0	1.1	10000.0	61.94	1117.52	80.50	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

100.	11.43	4	15.0	15.3	4800.0	11.77	8.20	7.10	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

```
****************************************
     *** REGULATORY (Default) ***
    PERFORMING CAVITY CALCULATIONS
  WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
****************************************
```

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	0.000	CONC (UG/M**3)	=	0.000
CRIT WS @10M (M/S)	=	99.99	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	99.99	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	99.99	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	9.95	CAVITY HT (M)	=	9.23
CAVITY LENGTH (M)	=	31.87	CAVITY LENGTH (M)	=	22.93

ALONGWIND DIM (M) = 20.42 ALONGWIND DIM (M) = 36.27

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

DIST TO MAX [illegible]

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	11.43	100.	0.