

New Mexico Environment Department  
Air Quality Bureau  
Analysis of Application to Modify Air Quality Permit No. 0042-M4  
Dicaperl Mining and Minerals Corp.  
Dicaperl-Socorro Perlite Processing Plant

September 24, 2009

This analysis has been made available for public review in accordance with 20.2.72.206.B.(2) NMAC. Members of the public may submit written comment related to this analysis within 30 days to:

Coleman Smith  
NSR Permitting  
NMED – Air Quality Bureau  
1301 Siler Road, Bldg. B  
Santa Fe, NM 87507

Or via e-mail:

[coleman.smith@state.nm.us](mailto:coleman.smith@state.nm.us)

**Statement of Basis - Narrative**  
**NSR Permits**

**Company:** Dicapert Minerals Corporation  
**Facility:** Socorro Perlite Plant  
**Permit No(s):** 0042-M6  
**Tempo/IDEA ID No.:** 1546 - PRN20090001  
**Permit Writer:** Coleman Smith

**Fee Tracking (not required for Title V)**

<b>Tracking</b>	<b>NSR tracking entries completed:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	<b>NSR tracking page attached to front cover of permit folder:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Paid Invoice Attached:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Balance Due Invoice Attached:</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	<b>Invoice Comments:</b> Filing fee \$500 paid 6/9/09. Balance due \$16,244 paid 7/8/09.

<b>Permit Review</b>	<b>Date to Enforcement:</b> TBD	<b>Inspector Reviewing:</b>
	<b>Date Enf. Review Completed:</b>	<b>Date of Reply:</b> (if necessary)
	<b>Date to Applicant:</b> 9/14/09	<b>Date of Reply:</b> TBD
	<b>Date of Comments from EPA:</b> NR	<b>Date to EPA:</b> NR
	<b>Date to Supervisor:</b> TBD	

**1.0 Plant Process Description:**

The Dicapert-Socorro facility is a perlite mining and processing facility, located approximately 3 miles west of the city of Socorro, in Socorro County, New Mexico. The facility is located at the following geographical coordinates: NLat.: 34° 01' 31.6"; WLong.: 106° 56' 10.3", and occupies portions of Sections 21,22,27,28, Range 1W, Township 3S.

The facility operates an open pit perlite mine that is authorized by the New Mexico Energy, Minerals and Natural Resources Department (NMEMRD). The mine is permitted for approximately 160 acres of open perlite deposit mining; to date, it is believe that the facility active mine occupies approx. 75 acres. The primary mining permit requires active mine remediation only upon mine closure; it is estimated that enough perlite exists in the deposit to allow mining at the current rate for approx. 40-50 years. The NMEMRD also issued this facility a concurrent reclamation permit. This type of permit requires concurrent reclamation of disturbed earth, primarily as a result of perlite fines disposal. The preceding discussion is relevant because it is believed that the facility emits large quantities of particulates due to wind erosion from the active mining area. Due to inherent and practical difficulties with the control of such particulates, and due to overlap with NMEMRD regulations, the Department has chosen not to require modeling or control of fugitives due to active mining operations in the current permitting action. If in the future, the emissions from such activities can be quantified, modeled, and controlled, the Department may decide to regulate at that time.

The application was originally assigned File No. 0042-M5, submitted in February, 2008. After being ruled incomplete and after approximately 13 revised submittals over the span of approximately 14 months, Dicaperl agreed to withdraw that application and submit a single revised application as 0042-M6. This allows the Administrative Record to be manageable in the event of a public hearing.

The application was originally submitted for the addition of two Raymond Mills to increase crushing capacity, along with increased ore silo storage capacity. During the course of the 0042-M5 revisions, several pieces of equipment were identified as existing, but never identified in Permit 0042-M4 and are added in the current revision. Dicaperl also requests a modification to the load-out baghouse for increased capacity.

The facilities' emissions have been recalculated for all 10 stacks; therefore this permit revision will require initial compliance testing on all stacks. The perlite ore dryer stack was never tested for NO<sub>x</sub>, CO, or SO<sub>2</sub>. Since Dicaperl has chosen to reduce dryer stack emission rates as based on their Fallon, NV facility, and because the dryer burns waste oil, the gaseous pollutants will be tested as well as the particulates.

NSPS Subpart OOO is applicable for affected units at this facility that were constructed, reconstructed, or modified after August 31, 1983 ("old"- OOO). Affected fugitive sources are uncontrolled Units 1-12, and affected stacks are S2 (Crushing/Screening Baghouse) and S4 (the Raymond Mill #2 baghouse). The NSPS emission limit for "old"- OOO baghouses is 0.022 gr/dscf. The permit also applies "old"- OOO opacity limits to non-OOO applicable units.

NSPS Subpart OOO is applicable for affected units at this facility that were constructed, reconstructed, or modified after April 22, 2008 ("new"- OOO). There are no affected fugitive sources, but affected stacks are S3 (Loadout Baghouse), S5 (the Raymond Mill #3 baghouse), and S6 (the Raymond Mill #4 baghouse). The NSPS emission limit for "new"- OOO baghouses is 0.014 gr/dscf.

NSPS Subpart UUU is applicable for affected units that were constructed, reconstructed, or modified after April 23, 1986. Subpart UUU is applicable for the perlite expansion furnaces (calciners), stacks S7-S10 which were included in Permit 0042-M4 but never installed. The NSPS emission limit for UUU calciners is 0.040 gr/dscf. Additionally, this Subpart would be applicable to the perlite ore dryer if reconstructed after the applicability date. However, Dicaperl has shown to the Department's satisfaction that the dryer drum replacement that occurred in 1998 did not constitute reconstruction, and Subpart UUU is not applicable to stack S1.

This facility has a total PTE of 142.9 tpy for TSP; however, only 66.6 tpy is emitted from stacks; the remaining 76.3 tpy is emitted from fugitive sources. The stack TSP PER is known to exceed 100 tpy; therefore the facility is a synthetic minor (SM) source but not TV according to 20.2.70.7.Q.(2) NMAC, which states that fugitive emissions shall not be considered unless one of the 28 facility categories listed. Although the applicant could not adequately calculate the facility PER, it is believed to be SM for all regulated particulate matter categories (TSP, PM<sub>10</sub>, and PM<sub>2.5</sub>).

2.0 **Description of this Modification:**

This modification consists of the addition of two (2) Raymond Mills for crushing, installation of three (3) ore storage silos, recalculation of emissions for four (4) perlite expansion furnaces (previously permitted but not installed), inclusion of additional existing equipment not previously permitted, and modifications to the load-out baghouse for increased capacity. The modification also requests an increase in the daily hours of operation for vehicle traffic (from 16 to 18 hrs/day), and limitation on daily hours of operation for Units 1, 2, 3, and 4 (primary crusher, screen, conveyor, and stockpile).

3.0 **PSD Applicability:**

A. This facility is a minor source before and after this modification.

4.0 **History (In descending chronological order, showing NSR and TV):** \*The asterisk denotes the current active NSR and Title V permits that have not been superseded.

Permit Number	Issue Date	Action Type	Description of Action (Changes)
* 0042M6	TBD	Sig. Rev.	Add 2 new Raymond Mills w/baghouses (2 new stacks), 3 silos, increase L/O baghouse capacity, inclusion of existing equipment, recalculation of emissions for all sources. 10 stacks total.
0042M5	6/9/09	Sig Rev.	Withdrawn
0042M4	6/30/04	Sig Rev.	Addition of 5 new stacks: 1 Raymond Mill w/baghouse, 4 expansion furnaces w/baghouses
0042M3R2	4/7/03	Admin Rev.	Corrects apparent typo so that permitted PM10=TSP.
0042M3R1	1/14/03	Revision due to Applicant Appeal – EIB Ruling	Applicant appealed Specific Condition 1.b. of Permit 0042M3 concerning haul road operating hours. EIB accepted revised application and air dispersion modeling.
0042M3	7/15/02	Sig Rev.	Decrease TSP from 60 tpy to 30 tpy (3 stacks, unchanged)
0042M2	1/3/97	Sig Rev.	First permitted equipment list and emissions (3 stacks).
0042M1	2/29/88	NPR	Addition of 10 tph classification system.
0042	5/24/74	NSR	Original issue.

5.0 **Public Response/Concerns:** Public interest has been expressed for this facility. Concerns raised are similar to those expressed on every Dicaperl permit revision since 0042M3: large quantities of fugitive dust observed past the property boundary and impacting citizens of Socorro. A public meeting has been tentatively scheduled for September 28, 2009.

6.0 **Compliance Testing:**

Unit No.	Compliance Test	Test Dates
All Stacks: S1-S10	EPA Methods Test for NOx, CO, SO2, TSP, PM10, PM2.5 for Stack S1; EPA Methods Test for TSP, PM10, PM2.5 for Stacks S2-S10 – see Permit 0042M6, Specific Condition 6	0042M6 issue + 180 days maximum
All stacks and fugitive sources	EPA Methods 9 and/or 22 for opacity and visible emissions	0042M6 issue + 180 days maximum and ongoing

7.0 **Startup and Shutdown:**

A. Was a Startup, Shutdown, and Malfunction Plan (SSM) submitted: Yes.

B. Were emissions from startup, shutdown, and scheduled maintenance operations calculated and included in the emission limits? No. The applicant claimed that is physically impossible for controlled emission sources to operate without power to baghouse fans. Therefore, no SSM emissions in excess of steady-state were reported.

8.0 **Compliance and Enforcement Status [Title V only]:** N/A

9.0 **Modeling:** A modeling report was issued on 9/22/09 by Eric Peters of the Department Modeling Section. This facility meets all NMAAQs and NAAQS; the values that most closely approach the standards are: PM2.5: 96.2% of the 24-hour standard; PM2.5: 94.8% of the annual standard; TSP: 90.7% of the 24-hour standard; and NOx: 88.0% of the 24-hour standard.

**State Regulatory Analysis(NMAC/AOCR):**

10.0

20 NMAC	Title	Applies (Y/N)	Comments
2.3	Ambient Air Quality Standards	Y	Applies to all facilities' sources
2.7	Excess Emissions	Y	Applies to all facilities' sources
2.15	Pumice, Mica, and Perlite Processing	Y	The Permittee is owner of perlite processing equipment and is subject to the emission limits set forth in 20.2.15.108, the stack requirements of 20.2.15.109, and the fugitive control measures of 20.2.15.110 NMAC.
2.61	Smoke and Visible Emissions	Y	Stack S1 (the perlite ore dryer) is Stationary Combustion Equipment.
2.70	Operating Permits	N	Facility PTE is > 100 TPY, but source does not meet the Title V applicability of 20.2.70.7.Q.(2) because stack emissions (not including fugitive) are < 100 tpy.

20 NMAC	Title	Applies (Y/N)	Comments
2.71	Operating Permit Fees	N	Source is not subject to 20.2.70 NMAC as cited at 20.2.71.109 NMAC.
2.72	Construction Permits	Y	Section 200.A.(2): PER > 10 pph or 25 tpy for a criteria pollutant..
2.73	NOI & Emissions Inventory Requirements	Y	Applicable to all facilities that require a permit. PER > 10 tpy for TSP, a criteria pollutant
2.74	Permits-Prevention of Significant Deterioration	N	PTE = 134 tpy therefore: Source is not one of the 28 listed and PTE is not > 250 tpy.
2.75	Construction Permit Fees	Y	This facility is subject to 20.2.72 NMAC.
2.77	New Source Performance	Y	Applies to any stationary source constructing or modifying and which is subject to the requirements of 40 CFR Part 60, as amended through November 30, 2006 and 40 CFR 60 Subpart OOO and UUU apply.
2.78	Emissions Standards for HAPs,	N	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 61. This facility has no measurable HAP emissions.
2.79	Permits – Nonattainment Areas	N	This facility is not located in a non-attainment area.
2.82	MACT Standards for Source Categories of HAPs.	N	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63. This facility has no measurable HAP emissions.

### 11.0 Federal Regulatory Analysis:

Air Programs Subchapter C (40 CFR 50)	National Primary and Secondary Ambient Air Quality Standards	Applies (Y/N)	Comments
C	Federal Ambient Air Quality Standards	Y	Defined as applicable at 20.2.70.7.E.11, and 20.2.72.200.A.(2): Any national ambient air quality standard.

NSPS Subpart (40 CFR 60)	Title	Applies (Y/N)	Comments
A	General Provisions	Y	Applies if any other subpart applies, and Subparts OOO and UUU are applicable for this facility.
40 CFR 60, Subpart OOO	Standards of Performance for Nonmetallic Mineral Processing Plants	Y	Establishes particulate matter emission limits/standards of performance for stacks and opacity limits for affected units. Stacks S2 and S4, as well as uncontrolled Units 1-12, are affected facilities that were constructed,

NSPS Subpart (40 CFR 60)	Title	Applies (Y/N)	Comments
			modified, or reconstructed after 8/31/83 but before 4/22/08, and are subject to the stack emission limit of 0.022 gr/dscf, 10% opacity for fugitive sources except crushers, and 15% opacity for crushers. Stacks S3, S5, and S6 are affected facilities that were constructed, modified, or reconstructed after 4/22/08, and are subject to The stack emission limit of 0.014 gr/dscf. There are no affected fugitive sources that are subject to the post-4/22/08 OOO reduced opacity limits.
40CFR 60, Subpart UUU	Standards of Performance for Calciners and Dryers in Mineral Industries	Y	Establishes particulate matter emission limits/standards of performance for stacks and opacity limits for affected units. Stacks S7-S10, the perlite expansion furnace baghouses, are affected facilities that were constructed, modified, or reconstructed after 4/43/86 are subject to the stack emission limit of 0.040 gr/dscf and a limit of 10% opacity. Stack S1 is not an affected unit, since it has not been modified or reconstructed after 4/23/86. Verification of non-applicability for Stack S1 has been provided to the Department.
40 CFR 60, Subpart Ka	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984	N	The Facility lists petroleum storage tanks T1-T7 as exempt under 20.2.72.202.B.(5) NMAC. The construction dates are not known, but all have a storage capacity less than 151,416 liters (40,000 gallons). Therefore, this Subpart is not applicable.
40 CFR 60, Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984	N	The Facility lists petroleum storage tanks T1-T7 as exempt under 20.2.72.202.B.(5) NMAC. The construction dates are not known. Tanks T1 and T2 have a storage capacity equal to 75 m <sup>3</sup> (20,000 gallons); all other tanks have capacities less than 75 m <sup>3</sup> . However, Tanks T1 and T2 are used to store waste oil, which has a vapor pressure of approximately 1.0 E-4 psia, which is less than 3.5 kPa (0.51 psia). Therefore, this Subpart is not applicable.

NESHAP Subpart (40 CFR 61)	Title	Applies (Y/N)	Comments
A	General Provisions	N	Applies if any other subpart applies.

MACT Subpart (40 CFR 63)	Title	Applies (Y/N)	Comments
A	General Provisions	N	Applies if any other subpart applies.

Miscellaneous	Title	Applies (Y/N)	Comments
40 CFR 64	Compliance Assurance Monitoring	N	Not a major source according to 20.2.70.7.Q.(2) NMAC.
40 CFR 70	Title V- State Operating Permit Programs	N	Operating Permit Program – is not applicable – New Mexico State has full delegated authority and Title V is administered under 20.2.70 NMAC.

12.0 **Exempt and/or Insignificant Equipment that do not require monitoring:**

**Title V - INSIGNIFICANT ACTIVITIES** (Dated March 24, 2005) as defined by 20.2.70.7.P NMAC: N/A

**NSR Exempt Equipment** (not entered into Tempo database)

Unit No./Description	JUSTIFICATION
T1 – Waste Oil Storage Tank (476 bbl)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy
T2 –Waste Oil Storage Tank (476 bbl)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy
T3 – No. 2 Diesel Fuel Storage Tank (238 bbl)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy
T4 – 10 wt. Motor Oil Storage Tank (12 bbl)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy
T5 – 30 wt. Motor Oil Storage Tank (12 bbl)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy
T6 – Unleaded Gasoline Storage Tank (12 bbl)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy
T7 - No. 2 Diesel Fuel Storage Tank (238 bbl)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy
49 – Pug Mill (processing rate 7.5 tons/hr)	20.2.72.202.B.(5) NMAC: emissions < 0.5 tpy

13.0 **New/Modified/Unique Conditions** (Format: Condition#: Explanation):

- Specific Condition 1: Equipment list (Table 1.a.) updated to include additional equipment, new equipment, the silos, and to clarify the baghouse stack assignments; conditions added to clarify hours of operation; conditions were added to require weight belts and data loggers on the primary crusher/stockpile conveyor and the process feed

- Specific Condition 2: Table 2.1 updated to include emissions from all 10 baghouse stacks; conditions added for NSPS-required opacity limits; conditions added for allowable visible emissions; conditions added to specify allowable particulate emissions from haul roads.
- Specific Condition 3: Condition added to monitor hours of operation; conditions added to monitor baghouse differential pressure and temperature; conditions added to monitor process rate; conditions added to monitor visible emissions and opacity; conditions added to monitor night time and high wind operations; conditions added to monitor vehicle use and particulate control.
- Specific Condition 4: Conditions added to keep records of all monitoring events, including hours of operation; all information collected by the data loggers, all visible emissions and opacity measurements; records of waste oil certification; night time and high wind operations records; vehicle traffic hours of operation and haul road water application; and baghouse maintenance.
- Specific Condition 5: Reporting conditions required only to comply with applicable NSPS and excess emissions reportable under 20.2.7 NMAC.
- Specific Condition 6: Conditions requiring initial stack testing on all 10 stacks for particulate matter, and stack 1 for NO<sub>x</sub>, CO, and SO<sub>2</sub>. Conditions requiring initial visible emissions and opacity measurements to show compliance with Specific Condition 2.

**MONITORING SPECIFICATIONS:** See Specific Condition 3

- 14.0 **For Title V action: Cross Reference Table between NSR Permit 0042M6 and TV Permit:**  
N/A – no TV permit
- 15.0 **Permit specialist's notes to other NSR or Title V permitting staff concerning changes and updates to permit conditions.** none

## Air Dispersion Modeling Summary for Permit No. 0042M6

**Report Date:** 9/22/2009

**NMED/AQB Modeler:** Eric Peters

**Project:** Socorro Perlite Plant

**Company:** Dicaperl Minerals

**Permit number:** 0042M6

**TEMPO ID:** 1546

**Location:** 3 miles west of Socorro, NM in Socorro County.

Section 21, Township 3 S, Range 1 W

UTM Coordinates: 321,238 m East, 3,766,668 m North, zone 13

Elevation = 4986 feet

Air Quality Control Region (AQCR): 156

**Brief:** Dicaperl Minerals has applied to the New Mexico Air Quality Bureau for a New Source Review air quality permit for the modification of the Socorro Perlite Plant facility (the facility). The facility is a perlite mine. The facility mines, crushes, and screens perlite. The purpose of this modification is to add two additional Raymond Mills (crushing), three storage ore silos, and four new perlite expansion furnaces. Existing equipment that was not listed in the permit previously will also be listed in the permit.

The following types of emission sources are included in the project: baghouse, crusher, perlite expansion furnace, Raymond mill, and road emissions. The emission units are described in Table 1: Table of Emissions and Stack Parameters, below. For this permit, modeling was required for the following pollutants: Carbon Monoxide (CO), Nitrogen Dioxide (NO<sub>2</sub>), Particulate Matter 10 micrometers or less in aerodynamic diameter (PM10), Particulate Matter (2.5 microns or less) (PM2.5), Sulfur Dioxide (SO<sub>2</sub>), and Total Suspended Particulate Matter (TSP).

### **Modeling Assumptions:**

The primary crusher and roads operate from 5AM to midnight. The rest of the facility operates continuously.

### **Permit conditions:**

Operating hours: The primary crusher and roads shall have maximum operating hours from 5AM to midnight.

**Conclusion:** This modeling analysis demonstrates that operation of the facility described in this report neither causes nor contributes to any exceedances of applicable air quality standards. The standards relevant at this facility are NAAQS for CO, NO<sub>2</sub>, PM10, PM2.5, and SO<sub>2</sub>; NMAAQs for CO, NO<sub>2</sub>, SO<sub>2</sub>, and TSP; and Class I and Class II PSD increments for PM10, and SO<sub>2</sub>.

**Action:** The permit can be issued based on this modeling analysis.

Modeling report submitted by Mark Cal (dated 6/10/2009) Revised modeling received 9/8/2009.

The air quality analysis demonstrates compliance with applicable regulatory requirements.

## Air Dispersion Modeling Summary for Permit No. 0042M6

**Model(s) Used:** AERMOD was used to run the modeling analysis.

Note: complete modeling input and output files can be made available and are located on the server *Magneto* in the directory *AQB/ModelingArchives/0042M6\_Dicaperl Minerals\_Socorro Perlite Plant*.

**Number of Model Runs:** AERMOD - 46 modeling runs were reviewed by NMED.

**Table 1a: Table of Emissions and Stack Parameters<sup>1</sup>: Area Sources**

Stack Number	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North (degrees)	Vertical Dimension (m)	TSP (g/s)	PM10 (g/s)	TSP (lb/hr)	PM10 (lb/hr)
FACILITY	0	175	100	0	0	0.29925	0.14315	2.375	1.136

**Table 1b: Table of Emissions and Stack Parameters<sup>1</sup>: Area Poly Sources**

Stack Number	Release Height (m)	Area (m <sup>2</sup> )	Northerly Length (m)	Angle from North (degrees)	Vertical Dimension (m)	TSP (g/s)	PM10 (g/s)	TSP (lb/hr)	PM10 (lb/hr)
DUMP	0	9340	100	0	0	0.16	0.0764	1.27	0.606

**Table 1c: Table of Emissions and Stack Parameters<sup>1</sup>: Volume Sources**

Stack Number	Description	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)	PM2.5 Rate (g/s)	PM2.5 Rate (lbs/hr)	PM10 Rate (g/s)	PM10 Rate (lbs/hr)	TSP Rate (g/s)	TSP Rate (lbs/hr)
L0006523	road emissions	4	7.1000	3.7200	0.0000	0.0000	0.0000	0.0000	0.025	0.200
L0006524	road emissions	4	7.1000	3.7200	0.0000	0.0000	0.0000	0.0000	0.025	0.200
L0006525	road emissions	4	7.1000	3.7200	0.0000	0.0000	0.0000	0.0000	0.025	0.200
L0006526	road emissions	4	12.0700	3.7200	0.0000	0.0000	0.0000	0.0000	0.012	0.094
to										
L0006541	road emissions	4	12.0700	3.7200	0.0000	0.0000	0.0000	0.0000	0.012	0.094
L0006607	road emissions	4	11.8900	3.7200	0.0000	0.0000	0.0000	0.0000	0.010	0.081
to										
L0006632	road emissions	4	11.8900	3.7200	0.0000	0.0000	0.0000	0.0000	0.010	0.081
L0007739	road emissions	4	12.0300	3.7200	0.0000	0.0000	0.0000	0.0000	0.011	0.085
to										
L0007778	road emissions	4	11.5900	3.7200	0.0000	0.0000	0.0000	0.0000	0.011	0.085
L0007779	road emissions	4	11.5300	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
to										
L0007796	road emissions	4	11.5300	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
L0007797	road emissions	4	11.8800	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
to										
L0007828	road emissions	4	11.8800	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
L0007829	road emissions	4	9.9700	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
to										
L0007833	road emissions	4	9.9700	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021

**Air Dispersion Modeling Summary for Permit No. 0042M6**

Stack Number	Description	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)	PM2.5 Rate (g/s)	PM2.5 Rate (lbs/hr)	PM10 Rate (g/s)	PM10 Rate (lbs/hr)	TSP Rate (g/s)	TSP Rate (lbs/hr)
L0007834	road emissions	4	11.7000	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
to										
L0007856	road emissions	4	11.7000	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
L0007857	road emissions	4	11.3200	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
to										
L0007870	road emissions	4	11.3200	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
L0007871	road emissions	4	11.8800	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
to										
L0007894	road emissions	4	11.8800	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
L0007895	road emissions	4	10.2300	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
to										
L0007900	road emissions	4	10.2300	3.7200	0.0000	0.0000	0.0000	0.0000	0.003	0.021
L0007901	road emissions	4	10.6400	3.7200	0.0000	0.0000	0.0000	0.0000	0.008	0.060
to										
L0007905	road emissions	4	10.6400	3.7200	0.0000	0.0000	0.0000	0.0000	0.008	0.060
L0007906	road emissions	4	12.0100	3.7200	0.0000	0.0000	0.0000	0.0000	0.001	0.005
to										
L0007922	road emissions	4	12.0100	3.7200	0.0000	0.0000	0.0000	0.0000	0.001	0.005
L0007923	road emissions	4	11.8400	3.7200	0.0000	0.0000	0.0000	0.0000	0.001	0.005
to										
L0007948	road emissions	4	11.8400	3.7200	0.0000	0.0000	0.0000	0.0000	0.001	0.005
L0007949	road emissions	4	9.2100	3.7200	0.0000	0.0000	0.0000	0.0000	0.001	0.005
to										
L0007952	road emissions	4	9.2100	3.7200	0.0000	0.0000	0.0000	0.0000	0.001	0.005
L0007953	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0009	0.000	0.000
L0007954	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0009	0.000	0.000
L0007955	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0009	0.000	0.000
L0007956	road emissions	0	0.0000	0.0000	0.0017	0.0133	0.0001	0.0009	0.000	0.000
L0007957	road emissions	0	0.0000	0.0000	0.0017	0.0133	0.0001	0.0009	0.000	0.000
L0007958	road emissions	0	0.0000	0.0000	0.0017	0.0133	0.0001	0.0009	0.000	0.000
L0007959	road emissions	0	0.0000	0.0000	0.0009	0.0075	0.0001	0.0009	0.000	0.000
to										
L0007979	road emissions	0	0.0000	0.0000	0.0003	0.0026	0.0001	0.0009	0.000	0.000
L0007980	road emissions	0	0.0000	0.0000	0.0005	0.0040	0.0001	0.0009	0.000	0.000
to										
L0008019	road emissions	0	0.0000	0.0000	0.0005	0.0040	0.0001	0.0009	0.000	0.000
L0008020	road emissions	4	11.8900	3.7200	0.0002	0.0018	0.0006	0.0050	0.000	0.003
to										
L0008032	road emissions	4	11.8900	3.7200	0.0002	0.0018	0.0006	0.0050	0.000	0.003
L0008033	road emissions	4	11.8900	3.7200	0.0002	0.0018	0.0168	0.1333	0.000	0.003
L0008034	road emissions	4	11.8900	3.7200	0.0002	0.0018	0.0168	0.1333	0.000	0.003
L0008035	road emissions	4	11.8900	3.7200	0.0002	0.0018	0.0168	0.1333	0.000	0.003
L0008036	road emissions	4	11.8900	3.7200	0.0002	0.0018	0.0110	0.0875	0.000	0.003
to										
L0008045	road emissions	4	11.9100	3.7200	0.0002	0.0018	0.0110	0.0875	0.000	0.003

### Air Dispersion Modeling Summary for Permit No. 0042M6

Stack Number	Description	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)	PM2.5 Rate (g/s)	PM2.5 Rate (lbs/hr)	PM10 Rate (g/s)	PM10 Rate (lbs/hr)	TSP Rate (g/s)	TSP Rate (lbs/hr)
L0008046	road emissions	4	11.9100	3.7200	0.0001	0.0010	0.0110	0.0875	0.000	0.003
to										
L0008048	road emissions	4	11.9100	3.7200	0.0001	0.0010	0.0110	0.0875	0.000	0.003
to										
L0008051	road emissions	4	11.9100	3.7200	0.0001	0.0010	0.0110	0.0875	0.000	0.003
L0008052	road emissions	4	11.9100	3.7200	0.0001	0.0010	0.0025	0.0200	0.000	0.003
to										
L0008056	road emissions	4	11.9100	3.7200	0.0001	0.0010	0.0025	0.0200	0.000	0.003
L0008057	road emissions	4	11.9100	3.7200	0.0001	0.0010	0.0000	0.0000	0.000	0.003
to										
L0008066	road emissions	4	11.9100	3.7200	0.0001	0.0010	0.0000	0.0000	0.000	0.003
L0008067	road emissions	4	11.5000	3.7200	0.0001	0.0010	0.0000	0.0000	0.000	0.003
to										
L0008086	road emissions	4	11.5000	3.7200	0.0001	0.0010	0.0000	0.0000	0.000	0.003
L0008087	road emissions	4	10.9100	3.7200	0.0001	0.0010	0.0000	0.0000	0.002	0.019
to										
L0008092	road emissions	4	10.9100	3.7200	0.0001	0.0010	0.0000	0.0000	0.002	0.019
L0008093	road emissions	4	11.1400	3.7200	0.0001	0.0010	0.0000	0.0000	0.002	0.019
to										
L0008099	road emissions	4	11.1400	3.7200	0.0001	0.0010	0.0000	0.0000	0.002	0.019
L0008100	road emissions	4	11.6600	3.7200	0.0001	0.0010	0.0000	0.0000	0.000	0.002
to										
L0008116	road emissions	4	11.6600	3.7200	0.0001	0.0010	0.0000	0.0000	0.000	0.002
L0008122	road emissions	4	11.7200	3.7200	0.0001	0.0010	0.0000	0.0000	0.000	0.002
to										
L0008123	road emissions	4	11.7200	3.7200	0.0001	0.0010	0.0013	0.0107	0.000	0.002
to										
L0008147	road emissions	4	11.7200	3.7200	0.0001	0.0010	0.0013	0.0107	0.000	0.002
L0008148	road emissions	0	0.0000	0.0000	0.0001	0.0010	0.0013	0.0107	0.000	0.000
to										
L0008167	road emissions	0	0.0000	0.0000	0.0001	0.0010	0.0013	0.0107	0.000	0.000
L0008168	road emissions	0	0.0000	0.0000	0.0000	0.0001	0.0013	0.0107	0.000	0.000
to										
L0008214	road emissions	0	0.0000	0.0000	0.0000	0.0001	0.0013	0.0107	0.000	0.000
L0008215	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0013	0.0107	0.000	0.000
to										
L0008244	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0013	0.0107	0.000	0.000
L0008245	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0002	0.0012	0.000	0.000
to										
L0008291	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0002	0.0012	0.000	0.000
L0008292	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.000	0.000
to										
L0008320	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.000	0.000

**Air Dispersion Modeling Summary for Permit No. 0042M6**

Stack Number	Description	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)	PM2.5 Rate (g/s)	PM2.5 Rate (lbs/hr)	PM10 Rate (g/s)	PM10 Rate (lbs/hr)	TSP Rate (g/s)	TSP Rate (lbs/hr)
L0008321	road emissions	0	0.0000	0.0000	0.0001	0.0005	0.0001	0.0006	0.000	0.000
to										
L0008325	road emissions	0	0.0000	0.0000	0.0001	0.0005	0.0001	0.0006	0.000	0.000
to										
L0008333	road emissions	0	0.0000	0.0000	0.0001	0.0005	0.0001	0.0006	0.000	0.000
L0008334	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.000	0.000
to										
L0008339	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.000	0.000
L0008340	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0054	0.0425	0.000	0.000
to										
L0008379	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0054	0.0425	0.000	0.000
L0008380	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0024	0.0192	0.000	0.000
L0008381	road emissions	0	0.0000	0.0000	0.0000	0.0000	0.0024	0.0192	0.000	0.000
L0008382	road emissions	0	0.0000	0.0000	0.0000	0.0001	0.0024	0.0192	0.000	0.000
to										
L0008405	road emissions	0	0.0000	0.0000	0.0000	0.0001	0.0024	0.0192	0.000	0.000
L0008406	road emissions	4	11.7200	3.7200	0.0000	0.0001	0.0000	0.0000	0.000	0.000
to										
L0008429	road emissions	4	11.7200	3.7200	0.0000	0.0001	0.0000	0.0000	0.000	0.000
L0008430	road emissions	4	11.9000	3.7200	0.0000	0.0001	0.0000	0.0000	0.000	0.000
to										
L0008476	road emissions	4	11.9000	3.7200	0.0000	0.0001	0.0000	0.0000	0.000	0.000
L0008477	road emissions	4	11.5000	3.7200	0.0000	0.0001	0.0000	0.0000	0.000	0.000
to										
L0008496	road emissions	4	11.5000	3.7200	0.0000	0.0001	0.0000	0.0000	0.000	0.000
UNCONTR1	crusher	2	0.0000	0.0000	0.0882	0.7000	0.3150	2.5000	0.844	6.700
UNCONTR2	crusher	2	6.9770	0.4650	0.0504	0.4000	0.1890	1.5000	0.517	4.100

**Air Dispersion Modeling Summary for Permit No. 0042M6**

**Table 1d: Table of Emissions and Stack Parameters<sup>1</sup>: Point Sources**

Stack Number	Description	Stack Height (ft)	Stack Height (m)	Diameter (ft)	Diameter (m)	Velocity (ft/s)	Velocity (m/s)	Temperature (°F)	Temperature (K)	NO <sub>2</sub> Rate (g/s)	NO <sub>2</sub> Rate (lbs/hr)	CO Rate (g/s)	CO Rate (lbs/hr)	SO <sub>2</sub> Rate (g/s)	SO <sub>2</sub> Rate (lbs/hr)	PM10 Rate (g/s)	PM10 Rate (lbs/hr)	TSP Rate (g/s)	TSP Rate (lbs/hr)	PM2.5 Rate (g/s)	PM2.5 Rate (lbs/hr)
CSBAG	baghouse	41.0	12.5	4.59	1.4	37	11.28	-460	0	0	0	0	0	0	0	0.66	5.2	0.66	5.2	0.04	0.3
DBAG	baghouse	60.4	18.4	2.26	0.7	98.4	30.0	165	347	0.28	2.2	0.08	0.6	0.77	6.1	0.92	7.3	0.92	7.3	0.92	7.3
FURN1	perlite expansion furnace	78.7	24.0	1.48	0.45	98.4	30.0	350	450	0.05	0.4	0.05	0.4	0	0	0.15	1.2	0.15	1.2	0.15	1.2
FURN2	perlite expansion furnace	78.7	24.0	1.48	0.45	98.4	30.0	350	450	0.05	0.4	0.05	0.4	0	0	0.15	1.2	0.15	1.2	0.15	1.2
FURN3	perlite expansion furnace	78.7	24.0	1.48	0.45	98.4	30.0	350	450	0.05	0.4	0.05	0.4	0	0	0.15	1.2	0.15	1.2	0.15	1.2
FURN4	perlite expansion furnace	78.7	24.0	1.48	0.45	98.4	30.0	350	450	0.05	0.4	0.05	0.4	0	0	0.15	1.2	0.15	1.2	0.15	1.2
LOBAG	baghouse	32.8	10.0	0.82	0.25	126	38.4	-460	0	0	0	0	0	0	0	0.05	0.4	0.05	0.4	0.01	0.1
RAYMILL2	Raymond mill	65.6	20.0	3.28	1	7.9	2.41	-460	0	0	0	0	0	0	0	0.09	0.7	0.09	0.7	0.01	0.1
RAYMILL3	Raymond mill	65.6	20.0	3.28	1	7.9	2.41	-460	0	0	0	0	0	0	0	0.05	0.4	0.05	0.4	0.01	0.1
RAYMILL4	Raymond mill	65.6	20.0	3.28	1	7.9	2.41	-460	0	0	0	0	0	0	0	0.05	0.4	0.05	0.4	0.01	0.1

<sup>1</sup> All values copied or converted from *Socorro Perlite Plant Permit Application*.

## **Air Dispersion Modeling Summary for Permit No. 0042M6**

**Modeling Parameters:** The AERMOD regulatory default parameters were included in assumptions made by the model. The optimized depletion option was used for the PM10 PSD increment model.

Building downwash produced by buildings at the facility was considered.

**Complex Terrain Data:** Both simple and complex types of terrain were used to model the facility. Elevations of receptors, facility sources, and surrounding sources were obtained from digitized USGS 7.5-minute maps and one degree maps.

**Receptor Grid:** The following grids were used to determine the facility's radius of impact for each pollutant.

Grid Type	Description	Shape	Spacing	Radius or Length
Cartesian	Intermediate	Square	500 meters	15 kilometers
Cartesian	Very fine	Fence line	50 meters	Fence line

Receptors outside of the radii of impact were discarded for the surrounding source runs. Receptors that demonstrated compliance were then discarded, and further detailed analysis was performed on the remaining receptors.

**Meteorological Data:** AERMOD – One (1) year, Intel (Rio Rancho) 1993

### **Adjacent Sources:**

The Division's Modeling Guidance was used to select 36 sources within 65 km of the facility. The entire lists of sources can be made available and can be found on the server *Magneto* in the directory *AQB/ModelingArchives/0042M6\_Dicaperl Minerals\_Socorro Perlite Plant*.

**Results Discussion:** Results are detailed in Table 2.

### **CO, NO<sub>2</sub>, PM10, SO<sub>2</sub>, and TSP Standards...**

#### **CO Analysis:**

The CO concentrations produced by the facility were demonstrated to be below CO significance levels, as detailed in Table 2. Therefore, no further modeling is required.

#### **NO<sub>2</sub> Analysis:**

The NO<sub>2</sub> concentrations produced by the facility were demonstrated to be below NO<sub>2</sub> significance levels, as detailed in Table 2. Therefore, no further modeling is required.

#### **PM10 Analysis:**

Compliance with the 24-hour, and annual PM10 NAAQS has been demonstrated, as detailed in Table 2.

Compliance with 24-hour, annual PSD Class II increments has been demonstrated, as detailed in Table 2.

## **Air Dispersion Modeling Summary for Permit No. 0042M6**

### **PM2.5 Analysis:**

Compliance with the 24-hour, and annual PM2.5 NAAQS has been demonstrated, as detailed in Table 2.

### **SO<sub>2</sub> Analysis:**

Compliance with the 3-hour, 24-hour, and annual SO<sub>2</sub> NAAQS and with 24-hour, and annual SO<sub>2</sub> NMAAQs has been demonstrated, as detailed in Table 2.

Compliance with 3-hour, 24-hour, annual PSD Class II increments has been demonstrated, as detailed in Table 2.

### **TSP Analysis:**

Compliance with the 24-hour, and annual TSP NMAAQs has been demonstrated, as detailed in Table 2.

### **PM10 PSD Class I increment...**

The nearest PSD Class I areas is Bosque del Apache, which is located 17.2 km from the facility. Compliance with 24-hour, annual PSD Class II increments has been demonstrated, as detailed in Table 2.

## Air Dispersion Modeling Summary for Permit No. 0042M6

### Table 2: Ambient Impact from Emissions

Pollutant	Contributing Sources	Averaging Period	Concentration ( $\mu\text{g}/\text{m}^3$ )	Concentration (ppm)	Receptor Elevation (ft)	UTMH (m)	UTMV (m)	Distance from Site (m)	Radius of Impact (m)	Applicable Standard	Value of Standard	Units of Standard	Percent of Standard or Significance Level	Background Concentration Added ( $\mu\text{g}/\text{m}^3$ )
CO	Alone	1-hour	16.556	0.0173	5167	320920	3766992	454	0	Significance	2000	$\mu\text{g}/\text{m}^3$	0.8	0
CO	Alone	8-hour	4.926	0.0051	5000	321356	3766992	345	0	Significance	500	$\mu\text{g}/\text{m}^3$	1.0	0
NO <sub>2</sub>	All	24-hour	4.400 <sup>δ</sup>	0.0028 <sup>δ</sup>	5014	321162	3766992	333	0	Significance	5	$\mu\text{g}/\text{m}^3$	88.0	0
NO <sub>2</sub>	Alone	24-hour	1.950 <sup>δ</sup>	0.0012 <sup>δ</sup>	5014	321162	3766992	333	0	Significance	5	$\mu\text{g}/\text{m}^3$	39.0	0
NO <sub>2</sub>	All	annual	0.600 <sup>φ</sup>	0.0004 <sup>φ</sup>	5000	321211	3766992	325	0	Significance	1	$\mu\text{g}/\text{m}^3$	60.0	0
NO <sub>2</sub>	Alone	annual	0.475 <sup>φ</sup>	0.0003 <sup>φ</sup>	5000	321211	3766992	325	0	Significance	1	$\mu\text{g}/\text{m}^3$	47.5	0
PM10	All	24-hour	56.800		5000	321211	3766992	325	8151	NAAQS	150	$\mu\text{g}/\text{m}^3$	37.9	0
PM10	Alone PSD	24-hour	24.849		5034	321114	3766992	347	8151	PSD Class II	30	$\mu\text{g}/\text{m}^3$	82.8	0
PM10	PSD	24-hour	1.070		5000	319831	3749508	17218	0	PSD Class I	8	$\mu\text{g}/\text{m}^3$	13.4	0
PM10	PSD	24-hour	24.931		5034	321114	3766992	347	8151	PSD Class II	30	$\mu\text{g}/\text{m}^3$	83.1	0
PM10	All	annual	27.400		5000	321211	3766992	325	8151	NAAQS	50	$\mu\text{g}/\text{m}^3$	54.8	0
PM10	Alone PSD	annual	4.819		5000	321211	3766992	325	8151	PSD Class II	17	$\mu\text{g}/\text{m}^3$	28.3	0
PM10	PSD	annual	4.939		5000	321211	3766992	325	8151	PSD Class II	17	$\mu\text{g}/\text{m}^3$	29.1	0
PM2.5	All	24-hour	33.672		5000	321356	3766992	345	8151	NAAQS	35	$\mu\text{g}/\text{m}^3$	96.2	7.3
PM2.5	Alone	24-hour	26.372		5000	321356	3766992	345	8151	NAAQS	35	$\mu\text{g}/\text{m}^3$	75.3	0
PM2.5	All	annual	14.222		5000	321259	3766992	325	8151	NAAQS	15	$\mu\text{g}/\text{m}^3$	94.8	7.3
PM2.5	Alone	annual	6.922		5000	321259	3766992	325	8151	NAAQS	15	$\mu\text{g}/\text{m}^3$	46.1	0
SO <sub>2</sub>	Alone	24-hour	8.536	0.0039	5014	321162	3766992	333	445	NMAAQS	0.1	ppm	3.9	0
SO <sub>2</sub>	Alone	3-hour	30.213	0.0137	5014	321162	3766992	333	445	NAAQS	0.5	ppm	2.7	0
SO <sub>2</sub>	Alone	annual	1.079	0.0005	5000	321211	3766992	325	445	NMAAQS	0.02	ppm	2.4	0
TSP	All	24-hour	136.073		4666	325610	3766095	4409	8151	NMAAQS	150	$\mu\text{g}/\text{m}^3$	90.7	26.6
TSP	Alone	24-hour	83.160		5000	321454	3766992	389	8151	NMAAQS	150	$\mu\text{g}/\text{m}^3$	55.4	0
TSP	All	annual	44.443		4666	325610	3766095	4409	8151	NMAAQS	60	$\mu\text{g}/\text{m}^3$	74.1	26.6
TSP	Alone	annual	13.484		5000	321211	3766992	325	8151	NMAAQS	60	$\mu\text{g}/\text{m}^3$	22.5	0

φ 75% annual conversion of NO<sub>x</sub> to NO<sub>2</sub> from EPA's Ambient Ratio Method (ARM) applied to calculate concentration.

δ NMED's 40% 24-hour conversion of NO<sub>x</sub> to NO<sub>2</sub> applied to calculate concentration.