NSR PERMIT APPLICATION
FOR THEMAC RESOURCES
NEW MEXICO COPPER CORPORATION'S
COPPER FLAT MINE
Hillsboro, New Mexico

PREPARED FOR

THEMAC RESOURCES

Dated February 22, 2013

Prepared by

Class One Technical Services, Inc.

CLASS 1 TECHNICAL SERVICES

Mail Application To:		**For Department use only:**
New Mexico Environment Department Air Quality Bureau Permitting Section 1301 Siler Road, Building B Santa Fe, NM 87507-3113 Phone: (505) 476-4300 Fax: (505) 476-4375 www.nmenv.state.nm.us/aqb		AIRS No.:

Universal Air Quality Permit Application

Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. For NOI applications, submit the entire UA1, UA2, and UA3 applications on a single CD (no copies are needed). For NOIs, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Use this application for streamline permits as well.

This application is being submitted as (check all that apply)**:** ☐ Request for a No Permit Required Determination (no fee)

☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).

Construction Status: **X** Not Constructed ☐ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility

Minor Source: ☐ a NOI 20.2.73 NMAC **X** 20.2.72 NMAC application/revision ☐ 20.2.72.300 NMAC Streamline application

Title V Source: ☐ Title V (new) ☐ Title V renewal ☐ TV minor mod. ☐ TV significant mod. TV Acid Rain: ☐ New ☐ Renewal

PSD Major Source: ☐ PSD major source (new) ☐ minor modification to a PSD source ☐ a PSD major modification

Acknowledgements: X I acknowledge that a pre-application meeting is available to me upon request ☐ NPR (no fee)

X $500 NSR Permit Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).

X Check No.: 2483 in the amount of $500 (Fee not required for Title V) ☐ This facility meets the applicable requirements to register as a Small Business and a check for 50% of the normal fee is enclosed (only applicable **provided** that NMED has a Small Business Certification Form from your company on file found at: http://www.nmenv.state.nm.us/aqb/permit/app_form.html).

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.72.200.A NMAC**
(i.e. an example of an application for a new minor source would be 20.2.72.200.A NMAC, one example of a low level cite for a Technical Revision could be: 20.2.72.219.B.1.b NMAC, or a Title V acid rain cite would be: 20.2.70.200.C NMAC)

Synthetic Minor Source Information: A source is synthetic minor if its uncontrolled emissions are above major source applicability thresholds, but the facility is minor because it has federally enforceable requirements (federal requirements or permit conditions) that limit controlled emissions below major source thresholds. Facilities can be synthetic minor for either Title V (20.2.70 NMAC) or PSD (20.2.74 NMAC) or both. The Department tracks synthetic minor sources that are within 20% of either TV or PSD major source thresholds, referring to these as Synthetic Minor 80 Sources (abbreviated SM80). Please check all that apply:
Prior to this permitting action this source is a ☐ TV major source, ☐ a TV synthetic minor source, ☐ a TV SM80 source.
Prior to this permitting action this source is a ☐ PSD major source, ☐ a PSD synthetic minor source, ☐ a PSD SM80 source.
This permitting action results in a ☐ TV synthetic minor source and/or ☐ PSD synthetic minor source.

Section 1 – Facility Information

Section 1-A: Company Information		AI # (if known):	Updating permit #:
1	Facility Name: Copper Flat Mine	Plant primary SIC Code (4 digits): 1021	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): From I-25 exit 62, proceed west on Hwy 152 for approx. 10 miles to entrance to Copper Flat Mine. Follow signs		
2	Plant Operator Company Name: New Mexico Copper Corporation (a wholly owned subsidiary of THEMAC Resources Group)	Phone/Fax: 505-830-6920/505-881-4616	
a	Plant Operator Address: 2424 Louisiana Blvd., NE, Suite 301 Albuquerque, NM 87110		
b	Plant Operator's New Mexico Corporate ID or Tax ID: 80-0612011		
3	Plant Owner(s) name(s): New Mexico Copper Corporation, a wholly owned subsidiary of THEMAC Resources Group Ltd	Phone/Fax: 505-830-6920/505-881-4616	

a	Plant Owner(s) Mailing Address(s): 2424 Louisiana Blvd., NE Suite 301 Albuquerque NM 87110	
4	Bill To (Company): New Mexico Copper Corporation	Phone/Fax: 505-883-2510 /505-881-4616
a	Mailing Address: 2424 Louisiana Blvd., NE Suite 301 Albuquerque NM 87110	E-mail: ecarnes@themacresourcesgroup.com
5	☐ Preparer: **X** Consultant: Paul Wade, Class One Technical Services, Inc.	Phone/Fax: (505) 830-9680 ext 102
a	Mailing Address: 3500 Comanche Rd. NE, Suite G, Albuquerque, NM 87107	E-mail: pwade@classonetech.com
6	Plant Operator Contact: Jens Deichmann	Phone/Fax: 505-883-2510/505-881-4616
a	Address: 2424 Louisiana Blvd., NE Suite 301 Albuquerque NM 87110	E-mail: jdeichmann@themacresourcesgroup.com
7	Air Permit Contact: Jens Deichmann	Title: Project Manager
a	E-mail: jdeichmann@themacresourcesgroup.com	Phone/Fax: 505-883-2510/505-881-4616
b	Mailing Address: 2424 Louisiana Blvd., NE Suite 301 Albuquerque NM 87110	

Section 1-B: Current Facility Status

1	Has this facility already been constructed? ☐ Yes **X** No	If yes, is it currently operating in New Mexico? ☐ Yes **X** No
2	Is the plant currently shut down? ☐ Yes **X** No	If yes, give month and year of shut down (MM/YY):
3	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes **X** No	
4	If Yes, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐Yes ☐No **X**N/A	
5	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes **X** No	If yes, the permit No. is: P-
6	Has this facility been issued a No Permit Required (NPR)? ☐ Yes **X** No	If yes, the NPR No. is:
7	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes **X** No	If yes, the NOI No. is:
8	Does this facility have a construction permit (20.2.72 NMAC)? ☐ Yes **X** No	If yes, the permit No. is:
9	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes **X** No	If yes, the register No. is:

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly:	Daily:	Annually:
b	Proposed	Hourly:	Daily:	Annually: 9,125,000 tons of ore processed
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly:	Daily:	Annually:
b	Proposed	Hourly:	Daily: 25,000 tons ore processed in primary crusher	Annually: 100,700 / 930 tons - copper / molybdenum concentrate

Section 1-D: Facility Location Information

1	Section: 25,26,35,36 30,31	Range: 7W 6W	Township: 15S	County: Sierra	Elevation (ft): 5485
2	UTM Zone: ☐ 12 or **X** 13			Datum: ☐ NAD 27 **X** NAD 83 ☐ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 264.15			UTM N (in meters, to nearest 10 meters): 3,650.40	

b	**AND** Latitude (deg., min., sec.): 32°, 57', 59.4" N	Longitude (deg., min., sec.): 107°, 31', 24.4" W
3	Name and zip code of nearest New Mexico town: Hillsboro 88042	
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Hillsboro drive 6.6 miles east on Highway 152 toward I-25. Turn west on road leading to the mine site.	
5	The facility is 4.2 miles northeast of Hillsboro.	
6	Status of land at facility (check one): ☐ Private ☐ Indian/Pueblo **X** Federal BLM ☐ Federal Forest Service ☐ Other (specify)	
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: Sierra County	
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.nmenv.state.nm.us/aqb/modeling/class1areas.html)? **X** Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: Gila Wilderness – 45.98	
9	Name nearest Class I area: Gila Wilderness	
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 45.98	
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: 4,650 meters (from permit boundary to closest house)	
12	Method(s) used to delineate the Restricted Area: Perimeter area will be fenced, at a minimum, with a continuous fence including signage. "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be indentified with signage only. Public roads cannot be part of a Restricted Area.	
13	Is this a stationary portable source as defined in 20.2.72.7.X NMAC? ☐ Yes **X** No	
14	Will this facility operate in conjunction with other air regulated parties on the same property? **X** No ☐ Yes If yes, what is the name and permit number (if known) of the other facility?	

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{hours}{day}$): 24	($\frac{days}{week}$): 7	($\frac{weeks}{year}$): 52	($\frac{hours}{year}$): 8760		
2	Facility's maximum daily operating schedule (if less than 24 $\frac{hours}{day}$)? Start:	☐AM ☐PM	End:	☐AM ☐PM		
3	Month and year of anticipated start of construction: April 2014					
4	Month and year of anticipated construction completion: June 2015					
5	Month and year of anticipated startup of new or modified facility: June 2015					
6	Will this facility operate at this site for more than one year? **X** Yes ☐ No					

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes **X** No If yes, specify:		
a	If yes, NOV date or description of issue:		NOV Tracking No:
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☐ No If Yes, provide the 1c & 1d info below:		
c	Document Title:	Date:	Requirement # (or page # and paragraph #):
d	Provide the required text to be inserted in this permit:		
2	Is air quality dispersion modeling being submitted with this application? **X** Yes ☐ No		
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes **X** No		

4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☐ Yes **X** No
a	If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☐ **Minor** (☐ <10 tpy of any single HAP **AND** ☐ <25 tpy of any combination of HAPS)
b	If 4.a is Yes, indentify the subparts in 40 CFR 61 & 40 CFR 63 that apply to this facility (If no subparts apply, enter "N/A."):

Section 1-G: Streamline Application

(This section applies to 20.2.72.300 NMAC Streamline applications only)

1	☐ I have filled out Section 18, "Addendum for Streamline Applications." ☐ N/A (This is not a Streamline application.)

Section 1-H: Title V Specific Information

(Fill this section out only if this is a Title V application.)

1	Responsible Official (20.2.70.300.D.2 NMAC):	Phone:
a	R.O. Title:	R.O. e-mail:
b	R. O. Address:	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):	Phone:
a	A. R.O. Title:	A. R.O. e-mail:
b	A. R. O. Address:	
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship):	
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.):	
a	Address of Parent Company:	
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.):	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations:	
7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers:	

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package printed double sided 'head-to-toe' 2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. If 'head-to-toe printing' is not possible, print single sided. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required.

2) If the application is for a NSR or Title V permitting action, include one working hard **copy** for Department use. This copy does not need to be 2-hole punched. Technical revisions only need to fill out Section 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical revision. TV Minor Modifications need only fill out Section 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.

3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically on compact disk(s) (CD). For permit application submittals, **two** CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal.

4) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver OR** one additional electronic copy of the air dispersion modeling including the input and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau. The complete dispersion modeling study, including all input/output files, should be submitted electronically as part of the electronic submittal.

5) If subject to PSD review under 20.2.74 NMAC (PSD) include,
   a. one additional hard copy and one additional CD copy for US EPA,
   b. one additional hard copy and one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional hard copy and one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted in duplicate (2 separate CDs). A single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format with the number of additional hard copies corresponding to the number of CD copies required. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 3 electronic files (2 MSWord docs: Universal Application section 1 and Universal Application section 3-19) and 1 Excel file of the tables (Universal Application section 2) on the CD(s). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision # (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. The footer information should not be modified by the applicant.

Table of Contents

Section 1: **General Facility Information**
Section 2: **Tables**
Section 3: **Application Summary**
Section 4: **Process Flow Sheet**
Section 5: **Plot Plan Drawn to Scale**
Section 6: **All Calculations**
Section 7: **Information Used to Determine Emissions**
Section 8: **Map(s)**
Section 9: **Proof of Public Notice**
Section 10: **Written Description of the Routine Operations of the Facility**
Section 11: **Source Determination**
Section 12: **PSD Applicability Determination for All Sources & Special Requirements for a PSD Application**
Section 13: **Discussion Demonstrating Compliance with Each Applicable State & Federal Regulation**
Section 14: **Operational Plan to Mitigate Emissions**
Section 15: **Alternative Operating Scenarios**
Section 16: **Air Dispersion Modeling**
Section 17: **Compliance Test History**
Section 18: **Addendum for Streamline Applications (streamline applications only)**

Section 19: **Requirements for the Title V (20.2.70 NMAC) Program (Title V applications only)**

Section 20: **Other Relevant Information**

Section 21: **Addendum for Landfill Applications**

Section 22: **Green House Gas Applicability**

Section 23: **Certification Page**

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Manufacturer	Model #	Serial #	Maximum or Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture or Reconstruction[2] / Date of Installation /Construction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	Applicable State & Federal Regulation(s) (i.e. 20.2.X, JJJJ, …)	Replacing Unit No.
S1	Open Pit - Drilling	NA	NA	NA	29,000 Hole/Year	29,000 Hole/Year	TBD TBD	NA NA	30502018	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S2	Open Pit - Blasting	NA	NA	NA	290 Blasts/Yr	290 Blasts/Yr	TBD TBD	NA NA	30502009	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S3	Prill Storage Silo	NA	NA	NA	3650 Tons/Yr	3650 Tons/Yr	TBD TBD	NA NA	30502009	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S4	Open Pit - Haul Truck Loading	NA	NA	NA	15,042,000 TPY	15,042,000 TPY	TBD TBD	NA NA	30502033	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S5	Open Pit - Bulldozing	NA	NA	NA	8760 Hour/Yr	8760 Hour/Yr	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S6	Raw Ore Surge Bin	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	1 NA	30502031	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77	
S7	Surge Bin Apron Feeder	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	2 1	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S8	Primary Crusher	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	2 1	30302401	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S9	Primary Crusher Apron Conveyor	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	2 1	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S10	Stacker Conveyor - Course Ore Pile	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	3 NA	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77	
S11	Course Ore Pile - Bulldozer	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	3 NA	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77	
S12	Course Ore Pile Reclaimer	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	4 2	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S13	Reclaimer Conveyor	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	4 2	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S14	Wet Mill	TBD	TBD	TBD	9,125,000 TPY	9,125,000 TPY	TBD TBD	NA NA	30302407	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S15	Lime Silo	TBD	TBD	TBD	10,950 TPY	10,950 TPY	TBD TBD	5 4	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77	
S16	Molybdenum Conveyor	TBD	TBD	TBD	930 TPY	930 TPY	TBD TBD	6 3	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	

Unit Number[1]	Source Description	Manufacturer	Model #	Serial #	Maximum or Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture or Reconstruction[2] / Date of Installation /Construction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	Applicable State & Federal Regulation(s) (i.e. 20.2.X, JJJJ, …)	Replacing Unit No.
S17	Molybdenum Bagger	TBD	TBD	TBD	930 TPY	930 TPY	TBD TBD	6 3	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S18	Copper Concentrate Conveyor	TBD	TBD	TBD	100,700 TPY	100,700 TPY	TBD TBD	7 NA	30302408	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S19	Truck Loading - Molybdenum	NA	NA	NA	930 TPY	930 TPY	TBD TBD	6 3	30502033	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S20	Truck Loading - Copper Concentrate	NA	NA	NA	100,700 TPY	100,700 TPY	TBD TBD	8 NA	30502033	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77, NSPS LLL	
S21	Truck Unloading - Low Grade Ore	NA	NA	NA	267,000 TPY	267,000 TPY	TBD TBD	NA NA	30502031	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S22	Bulldozer - Low Grade Ore Stockpile	NA	NA	NA	5840 Hour/Yr	5840 Hour/Yr	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S23	Truck Unloading - Waste Dump Stockpile	NA	NA	NA	5,650,000 TPY	5,650,000 TPY	TBD TBD	NA NA	30502031	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S24	Bulldozer - Waste Dump Stockpile	NA	NA	NA	8760 Hour/Yr	8760 Hour/Yr	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S25	Bulldozer - Tailings Dam Area	NA	NA	NA	8760 Hour/Yr	8760 Hour/Yr	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S26	Scraper Loading - Tailing Area	NA	NA	NA	1,950,000 TPY	1,950,000 TPY	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S27	Scraper Unloading - Tailing Area	NA	NA	NA	1,950,000 TPY	1,950,000 TPY	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S28	Scraper Travel	NA	NA	NA	3,878 Mile/Yr	3,878 Mile/Yr	TBD TBD	9 NA	30502011	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S29	Truck Traffic - Mine Haul Trucks/Light Vehicles	NA	NA	NA	610,649 Mile/Yr	610,649 Mile/Yr	TBD TBD	10 NA	30502011	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77	
S30	Truck Traffic - Product/Chemical Delivery Trucks	NA	NA	NA	22,073 Mile/Yr	22,073 Mile/Yr	TBD TBD	11 NA	30502011	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 7, 72, 73, 75, 77	
S31	Mine Road Grader	NA	NA	NA	5000 Hour/Yr	5000 Hour/Yr	TBD TBD	NA NA	30502090	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S32	Wind Erosion - Course Ore Pile	NA	NA	NA	1.2 Acres	1.2 Acres	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	

Unit Number[1]	Source Description	Manufacturer	Model #	Serial #	Maximum or Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture or Reconstruction[2] / Date of Installation /Construction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	Applicable State & Federal Regulation(s) (i.e. 20.2.X, JJJJ, …)	Replacing Unit No.
S33	Wind Erosion - Open Pit Area	NA	NA	NA	169 Acres	169 Acres	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S34	Wind Erosion - Low Grade Ore Stockpile Area	NA	NA	NA	68 Acres	68 Acres	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S35	Wind Erosion - Waste Dump Stockpile Area	NA	NA	NA	210 Acres	210 Acres	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	
S36	Wind Erosion - Tailings Area	NA	NA	NA	547 Acres	547 Acres	TBD TBD	NA NA	30502099	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	20.2.3, 72, 73, 75, 77	

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.
[2] Specify dates required to determine regulatory applicability.
[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.nmenv.state.nm.us/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at http://www.nmenv.state.nm.us/aqb/forms/InsignificantListTitleV.pdf . TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
EG1	Emergency Generator	TBD	TBD TBD	TBD TBD	20.2.72.202.B.3	TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
EG2	Emergency Generator	TBD	TBD TBD	TBD TBD	20.2.72.202.B.3	TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
FTK1	Diesel Fuel	TBD	TBD TBD	40,000 Gallons	20.2.72.202.B.2.b	TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-001	Pax Mix Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-002	Pax Distribution Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-003	MIBC Storage Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-004	No. 2 Diesel Storage Tank	TBD	TBD TBD	1,700 Gallons	20.2.72.202.B.2.b	TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-005	Milk Of Lime Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-006	Milk Of Lime Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-007	NaHS Mix Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-008	NaHS Distribution Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-009	Moly Collector Mix Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-010	Moly Collector Distribution Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-011	AERO 238 Mix Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
3014-TK-012	AERO 238 Distribution Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-013	Flocculant Mix Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3014-TK-014	Flocculant Distribution Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3015-TK-001	Gravity Concentrate Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3016-TK-001	Rougher Flotation Conditioning Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3016-TK-002	Copper 1st Cleaner Conditioning Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3016-TK-003	Copper - Moly Concentrate Thickener Overflow Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3017-TK-001	Moly Filter Feed Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3017-TK-002	Copper-Moly Separation Conditioning Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3017-TK-003	Moly Concentrate Filter Cloth Wash Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3018-TK-001	Copper Concentrate Thickener Overflow Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3018-TK-002	Copper Concentrate Stock Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3018-TK-003	Copper Concentrate Filter Cloth Wash Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
3018-TK-004	Wheel Wash Surge Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
4012-TK-001	Fresh Water Tank No. 1 (By others)	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
4012-TK-002	Reclaim Reservoir Fresh Water Tank	TBD	TBD TBD			TBD TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
4012-TK-003	Plant Fresh Water Storage	TBD	TBD			TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
4012-TK-003	Tank	TBD	TBD			TBD	X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
4012-TK-004	Potable Water Tank	TBD	TBD			TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			TBD			TBD	
4012-TK-005	Fresh Water Tank No. 2 (By others)	TBD	TBD			TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			TBD			TBD	
4012-TK-006	Seal Water Tank	TBD	TBD			TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			TBD			TBD	
4013-TK-001	Plant Reclaim Water Storage Tank	TBD	TBD			TBD	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			TBD			TBD	

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions.

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
1	Water/Chemical Suppressant Sprays	TBD	PM	S6	75%	"Mojave Desert Air Quality Management District, Table 5"
2	Primary Crusher Vault Particulate Dust Collector	TBD	PM	S7, S8, S9	99.9%	Filter Manufacturer
3	Water/Chemical Suppressant Sprays	TBD	PM	S10	75%	"Mojave Desert Air Quality Management District, Table 5"
4	Coruse Ore Reclaimer Particulate Dust Collector	TBD	PM	S11, S12	99.9%	Filter Manufacturer
5	Lime Silo Particulate Dust Collector	TBD	PM	S14	99.9%	Filter Manufacturer
6	Molybdenum Mill Area Particulate Dust Collector	TBD	PM	S15, S16, S18	99.9%	Filter Manufacturer
7	Copper Concentrate Storage Pile Passive Full Enclosure	TBD	PM	S17	85%	"Mojave Desert Air Quality Management District, Table 5"
8	Copper Concentrate Truck Loading Passive 3/4 Enclosure	TBD	PM	S19	70%	"Mojave Desert Air Quality Managemant District, Table 5"
9	Scraper Travel Dust Control	TBD	PM	S28	60%	NMED "Watering"
10	Haul Truck/Light Vehicle Haul Road Dust Control	TBD	PM	S29	93%	MRI "Control of Open Fugitive Dust Source" EPA-450/3-88
11	Product/Chemical Delivery Access Road Dust Control	TBD	PM	S30	80%	NMED "Base Course and Watering"

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

Table 2-D: Maximum Emissions (under normal operating conditions)

☐ **This Table was intentionally left blank because it would be identical to Table 2-E.**

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. For each unit with flashing, list tank-flashing emissions estimates as a separate line item (20.2.70.300.D.5 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.B.6, & 20.2.74.301 NMAC). Fill all cells in this tablewith the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed with a minimum of two significant figures[1]. If there are any significant figures to the left of a decimal point, there shall be no more than one significant figure to the right of the decimal point.

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
S1	-	-	-	-	-	-	-	-	5.4	19	2.8	9.9	0.57	2.0	-	-	-	-
S2		54		214	-	-		6.4	54	7.8	28	1.2	1.6	0.068	-	-	-	-
S3	-	-	-	-	-	-	-	-	0.88	0.064	0.42	0.030	0.063	0.0046	-	-	-	-
S4	-	-	-	-	-	-	-	-	10	44	4.7	21	0.72	3.1	-	-	-	-
S5	-	-	-	-	-	-	-	-	21	41	4.5	8.9	2.2	4.3	-	-	-	-
S6	-	-	-	-	-	-	-	-	6.1	27	2.9	13	0.44	1.9	-	-	-	-
S7	-	-	-	-	-	-	-	-	3.1	14	1.1	5.0	0.18	0.78	-	-	-	-
S8	-	-	-	-	-	-	-	-	5.6	25	2.5	11	0.38	1.6	-	-	-	-
S9	-	-	-	-	-	-	-	-	3.1	14	1.1	5.0	0.18	0.78	-	-	-	-
S10	-	-	-	-	-	-	-	-	6.1	27	2.9	13	0.44	1.9	-	-	-	-
S11	-	-	-	-	-	-	-	-	21	30	4.5	6.5	2.2	3.2	-	-	-	-
S12	-	-	-	-	-	-	-	-	6.1	27	2.9	13	0.44	1.9	-	-	-	-
S13	-	-	-	-	-	-	-	-	6.1	27	2.9	13	0.44	1.9	-	-	-	-
S14	-	-	-	-	-	-	-	-	6.1	27	2.9	13	0.44	1.9	-	-	-	-
S15	-	-	-	-	-	-	-	-	18	3.9	12	2.5	0.90	0.20	-	-	-	-
S16	-	-	-	-	-	-	-	-	0.00071	0.0031	0.00034	0.0015	5.1E-05	0.00022	-	-	-	-
S17	-	-	-	-	-	-	-	-							-	-	-	-
S18	-	-	-	-	-	-	-	-	0.011	0.048	0.0052	0.023	0.00079	0.0035	-	-	-	-
S19	-	-	-	-	-	-	-	-	0.00071	0.0031	0.00034	0.0015	5.1E-05	0.00022	-	-	-	-
S20	-	-	-	-	-	-	-	-	0.011	0.048	0.0052	0.023	0.00079	0.0035	-	-	-	-
S21	-	-	-	-	-	-	-	-	0.18	0.78	0.084	0.37	0.013	0.056	-	-	-	-
S22	-	-	-	-	-	-	-	-	21	20	4.5	4.3	2.2	2.1	-	-	-	-
S23	-	-	-	-	-	-	-	-	3.8	17	1.8	7.8	0.27	1.2	-	-	-	-
S24	-	-	-	-	-	-	-	-	21	30	4.5	6.5	2.2	3.2	-	-	-	-
S25	-	-	-	-	-	-	-	-	2.9	4.2	0.54	0.78	0.30	0.44	-	-	-	-
S26	-	-	-	-	-	-	-	-	1.3	5.7	0.61	2.7	0.092	0.41	-	-	-	-
S27	-	-	-	-	-	-	-	-	0.15	0.65	0.070	0.31	0.011	0.047	-	-	-	-
S28	-	-	-	-	-	-	-	-	8.4	31	2.7	10	0.27	1.0	-	-	-	-
S29	-	-	-	-	-	-	-	-	1246	4559	355	1300	36	130	-	-	-	-
S30	-	-	-	-	-	-	-	-	18	67	4.7	17	0.47	1.7	-	-	-	-
S31	-	-	-	-	-	-	-	-	11	28	3.8	9.6	0.35	0.87	-	-	-	-
S32	-	-	-	-	-	-	-	-	0.25	1.1	0.12	0.54	0.018	0.081	-	-	-	-

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
S33	-	-	-	-	-	-	-	-	3.2	14	1.6	7.0	0.24	1.0	-	-	-	-
S34	-	-	-	-	-	-	-	-	1.3	5.6	0.64	2.8	0.10	0.42	-	-	-	-
S35	-	-	-	-	-	-	-	-	3.9	17	2.0	8.6	0.30	1.3	-	-	-	-
S36	-	-	-	-	-	-	-	-	3.3	14	1.6	7.2	0.25	1.1	-	-	-	-
Totals		54		214	-	-		6.4	1518	5145	460	1519	54	170	-	-	-	-

[1] **Significant Figures Examples:** One significant figure – 0.03, 3, 0.3. Two significant figures – 0.34, 34, 3400, 3.4

[2] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations.

Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. For each unit with flashing, list tank-flashing emissions estimates as a separate line item (20.2.70.300.D.5 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.B.6, & 20.2.74.301 NMAC). Fill all cells in this tablewith the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed with a minimum of two significant figures[1]. If there are any significant figures to the left of a decimal point, there shall be no more than one significant figure to the right of the decimal point. Please do not change the column widths on this table.

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
S1	-	-	-	-	-	-	-	-	5.4	19	2.8	9.9	0.57	2.0	-	-	-	-
S2		54		214	-	-		6.4	54	2.3	28	1.2	1.6	0.068	-	-	-	-
S3	-	-	-	-	-	-	-	-	0.88	0.064	0.42	0.030	0.063	0.0046	-	-	-	-
S4	-	-	-	-	-	-	-	-	10	44	4.7	21	0.72	3.1	-	-	-	-
S5	-	-	-	-	-	-	-	-	21	41	4.5	8.9	2.2	4.3	-	-	-	-
S6	-	-	-	-	-	-	-	-	1.5	6.7	0.72	3.2	0.11	0.48	-	-	-	-
S7	-	-	-	-	-	-	-	-							-	-	-	-
S8	-	-	-	-	-	-	-	-	1.0	4.5	1.0	4.5	1.0	4.5	-	-	-	-
S9	-	-	-	-	-	-	-	-							-	-	-	-
S10	-	-	-	-	-	-	-	-	1.5	6.7	0.7	3.2	0.1	0.48	-	-	-	-
S11	-	-	-	-	-	-	-	-	15	21	3.1	4.5	1.50	2.2	-	-	-	-
S12	-	-	-	-	-	-	-	-	1.0	4.5	1.0	4.5	1.0	4.5	-	-	-	-
S13	-	-	-	-	-	-	-	-							-	-	-	-
S14	-	-	-	-	-	-	-	-	0.23	1.0	0.11	0.47	0.160	0.072	-	-	-	-
S15	-	-	-	-	-	-	-	-	0.043	0.00094	0.043	0.0094	0.043	0.0094	-	-	-	-
S16	-	-	-	-	-	-	-	-							-	-	-	-
S17	-	-	-	-	-	-	-	-	1.0	4.5	1.0	4.5	1.0	4.5	-	-	-	-
S19	-	-	-	-	-	-	-	-							-	-	-	-
S18	-	-	-	-	-	-	-	-	0.0017	0.0072	0.00078	0.0034	0.00012	0.00052	-	-	-	-
S20	-	-	-	-	-	-	-	-	0.0033	0.014	0.0016	0.0069	0.00024	0.0010	-	-	-	-
S21	-	-	-	-	-	-	-	-	0.18	0.78	0.084	0.37	0.013	0.056	-	-	-	-
S22	-	-	-	-	-	-	-	-	21	20	4.5	4.3	2.2	2.1	-	-	-	-
S23	-	-	-	-	-	-	-	-	3.8	17	1.8	7.8	0.27	1.2	-	-	-	-
S24	-	-	-	-	-	-	-	-	21	30	4.5	6.5	2.2	3.2	-	-	-	-
S25	-	-	-	-	-	-	-	-	2.9	4.2	0.54	0.78	0.30	0.44	-	-	-	-
S26	-	-	-	-	-	-	-	-	1.3	5.7	0.61	2.7	0.092	0.41	-	-	-	-
S27	-	-	-	-	-	-	-	-	0.15	0.65	0.070	0.31	0.011	0.047	-	-	-	-
S28	-	-	-	-	-	-	-	-	3.3	12	1.1	4.0	0.11	0.40	-	-	-	-
S29	-	-	-	-	-	-	-	-	87	319	25	91	2.5	9.1	-	-	-	-
S30	-	-	-	-	-	-	-	-	3.7	13	0.95	3.5	0.095	0.35	-	-	-	-
S31	-	-	-	-	-	-	-	-	11	28	3.8	9.6	0.35	0.87	-	-	-	-
S32	-	-	-	-	-	-	-	-	0.25	1.1	0.12	0.54	0.018	0.081	-	-	-	-

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
S33	-	-	-	-	-	-	-	-	3.2	14	1.6	7.0	0.24	1.0	-	-	-	-
S34	-	-	-	-	-	-	-	-	1.3	5.6	0.64	2.8	0.10	0.42	-	-	-	-
S35	-	-	-	-	-	-	-	-	3.9	17	2.0	8.6	0.30	1.3	-	-	-	-
S36	-	-	-	-	-	-	-	-	3.3	14	1.6	7.2	0.25	1.1	-	-	-	-
Totals		54		214	-	-		6.4	279	657	97	222	19	48	-	-	-	-

[1] **Significant Figures Examples**: One significant figure – 0.03, 3, 0.3. Two significant figures – 0.34, 34, 3400, 3.4

[2] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations.

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

X This table is intentionally left blank as all SSM emissions at this facility do not require an increase in Requested Allowables greater than those listed in Table 2-E. If you are required to report GHG emissions as described in Section 21, include any GHG emissions due Startup, Shutdown, and/or Scheduled Maintenance in Table 2-P. Provide explanation in Section 6.

All applications, including NOI applications, must fill out this table, reporting Maximum Emissions during Startup, Shutdown and Scheduled Maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). Only report SSM emissions greater than the cooresponding Table 2-E emissions[1]. Not providing emissions for a unit indicates that SSM emissions for this unit are less than the Requested Allowables for that unit in Table 2-E. In Section 6, provide emissions calculations for any emissions listed in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.nmenv.state.nm.us/aqb/permit/app_form.html) for more detailed instructions. For each unit with flashing, list tank-flashing emissions estimates as a separate line item (20.2.72.203.A.3 and 20.2.70.300.D.5 NMAC). List all units and SSM fugitives, except GHGs, in this table. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals																		

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in the table below. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[2] **Condensables**: Include condensable particulate matter emissions in particulate matter calculations.

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

X I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. List tank-flashing emissions estimates as a separate line item. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		TSP		PM10		PM2.5		☐ H_2S or ☐ Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package.

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate (acfs)	Flow Rate (dscfs)	Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter or L x W (ft)
1	S7, S8, S9	V	Yes	4	Ambient	12000		0	63.7	2.00
2	S11, S12	V	Yes	4	Ambient	12000		0	63.7	2.00
3	S15, S16, S18	H	No	40	Ambient	12000		0	63.7	2.00
4	S14	H	No	70	Ambient	500		0	10.6	1.00

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

Stack No.	Unit No.(s)	Total HAPs		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																			

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (No. 2 Diesel, Natural Gas, Coal, …)	Specify Units				
		Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash

Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)

Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary. See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
FX: Fixed Roof	**Mechanical Shoe Seal**	**Liquid-mounted resilient seal**	**Vapor-mounted resilient seal**	**Seal Type**	**WH**: White	Good
IF: Internal Floating Roof	**A**: Primary only	**A**: Primary only	**A**: Primary only	**A**: Mechanical shoe, primary only	**AS**: Aluminum (specular)	Poor
EF: External Floating Roof	**B**: Shoe-mounted secondary	**B**: Weather shield	**B**: Weather shield	**B**: Shoe-mounted secondary	**AD**: Aluminum (diffuse)	
P: Pressure	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**LG**: Light Gray	
					MG: Medium Gray	
					BL: Black	
					OT: Other (specify)	

Note: 1.00 bbl = 0.159 M^3 = 42.0 gal

Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Run of Mine Ore	Copper Ore, Molybdenum Ore, Waste Ore	Solid	15,042,000 tons per year	Copper Concentrate	Copper	Solid	100,700 tons/yr
				Molybdenum Concentrate	Molybdenum	Solid	930 tons/yr

Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
NA									

Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Unit No.	Parameter/Pollutant Measured	Location of Measurement	Unit of Measure	Acceptable Range	Frequency of Maintenance	Nature of Maintenance	Method of Recording	Averaging Time
NA								

Table 2-P: Green House Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC that are Major for GHGs as determined in Section 22 of this application are required to complete this Table if so directed in Section 22 or are major for GHGs and have an existing GHG BACT. Applicants must report potential emission rates in short tons per year. Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table.

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]									Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**310**	**21**	**23,900**	**footnote 3**										
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis** is the ton per year green house gas emission before adjustment with its GWP.

[5] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

Section 3

Application Summary

The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will effect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

Routine or predictable emissions during Startup, Shutdown, and Maintenance (SSM): Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.nmenv.state.nm.us/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Ltd. (THEMAC), is applying to the New Mexico Environmental Department–Air Quality Bureau (NMED AQB) for a 20.2.72.200.A.1 NMAC minor source air quality construction permit for a proposed open pit copper mine identified as "Copper Flat Mine".

Location

The Copper Flat Project is a copper/molybdenum porphyry deposit located in the Hillsboro Mining District in Sierra County, South Central New Mexico. The center of the mineralization is at approximately UTM coordinates 263,150 meters easting, 3,650,750 meters northing, Zone 13, NAD 83. The Project is approximately 150 miles south of Albuquerque, New Mexico and approximately 20 miles southwest of Truth or Consequences, New Mexico (straight line distances). Access from Truth or Consequences is by 24 miles of paved highway and 3 miles of all-weather gravel road.

History

Development of the Copper Flat Project began in the 1970's by Quintana Mineral Corporation. Quintana Mineral Corporation applied for and received Air Quality Permit #0365. In 1982 operating under Air Quality Permit #0365-M1, the Copper Flat Partnership, Ltd. developed and operated the Project, which consisted of an open pit copper mine, a 15,000-ton per day flotation mill, and a 515-acre Tailings Storage Facility (TSF). The Copper Flat Mine officially commenced full commercial production in April, 1982. In July 1982 the mine was shut down due to low copper prices and other economic considerations. In 1986 all on-site surface facilities were removed and a BLM approved program of non-destructive reclamation was carried out. Most of the property's infrastructure, including building foundations, power lines and water pipelines were preserved for reuse in the future in the event copper prices recovered sufficiently to make re-establishing the Project economically viable. In April of 1995, Alta Gold Company applied for a revision to Air Quality Permit #0365-M1. However, Alta Gold Company declared bankruptcy in early 1999. Air quality permit #0365-M1 was closed in 2002 due to inactivity.

Overview

NMCC is proposing to reopen the Copper Flat Project open pit mine to operate 24 hours per day, seven days per week, and 365 days per year. The mining of new ore would entail expansion of the existing open pit. A portion of the ore body at the Copper Flat Mine is exposed at the surface and would be mined by conventional truck and shovel open pit methods in a manner similar to the previous operation. An operational life of the mine is projected to be approximately 11 years. Over the life of the Project, approximately 159 million tons of material would be mined. The operation would mine an estimated annual average of 15.3 million tons of material per year over years one through 10. Approximately 1.7 million tons would be mined in pre-production and 4.7 million tons in year 11. The crushing operation would process an average 9.1 million tons of ore per year from years 1 through ten and between 4.0 million and 7.0 million tons in year 11 depending when the low grade ore is milled. Waste rock

production is estimated to average 5.7 million tons per year or 60.7 million tons over the life of the mine. Approximately 3.0 million tons total of low grade ore would be mined in years one through three, with the majority of that, 2.5 million tons, being mined in year two. The low grade copper ore would likely be processed during operations as blend material and/or at the end of the mine life, depending on economic conditions at the time. As such, it would require stockpiling until such time at it is suitable for processing.

Mining

Preproduction stripping of overburden was completed in 1982 during the previous operation. Approximately 3 million tons of overburden material was stripped and over 1.2 million tons of ore were mined from the existing pit during the early 1980s. The Copper Flat Mine ore body would be mined by a multiple bench, open pit method. The existing pit would eventually be enlarged to approximately 2,800 feet by 2,800 feet with an ultimate depth of approximately 900 feet. The working, inter-bench slope of the pit walls would range from 38 to 45 degrees, but would be optimized based on on-going evaluations of project economics and pit slope engineering. Ore material from the pit would be drilled and blasted, loaded and hauled out of the pit to the primary crusher. Drilling and blasting will break up the rock in the open pit. Blasting would be limited to daylight (afternoon) hours and performed by licensed blasters. Ammonium nitrate and diesel fuel (ANFO) will be used as the explosive. The broken rock would be loaded onto end dump haul trucks for transport to the primary crusher, low grade stockpile, or Waste Rock Disposal Facility (WRDF) depending on the assay classification. Loading of both ore and waste rock would be accomplished by using hydraulic shovels and/or frontend loaders. Ore and waste rock haulage would be handled by a fleet of end-dump, diesel-powered haulage trucks of a 100 ton capacity.

Waste Rock Stockpile

Waste rock disposal facilities (WRDFs) would be located 3,000 to 4,000 feet east of the pit exit. This disposal area would be expanded under the current MPO to cover approximately 180 acres. Total material contained in the disposal areas at the end of the expected life of the project would be approximately 60.7 million tons.

Low Grade Stockpile

The low grade stockpile would cover an area of approximately 20 acres. The total storage planned for the low grade stockpile is 2.87 million tons of low grade ore of rock assaying less than 0.20 percent copper. The low grade stockpile is located to the northeast of the mine. The location was selected to be a reasonable haul during the mine life for the storage of the material as well as a short haul distance to the crusher at the end of the mine life.

Ore Processing

The primary crusher is to be located about 2,500 feet east of the pit. Run-of –mine (ROM) ore is trucked from the mine to the primary crusher where it is dumped directly into the crusher surge bin that feeds a gyratory crusher, which crushes the ROM ore to a nominal size of less than 8 inches in diameter. Delivery of ore by truck would be on a schedule similar to the mining operations. The crusher is located below ground level to limit noise and contain dust. Crusher discharge would be fed by apron feeder onto a belt conveyor for transport to the coarse ore stockpile located near the mill. Water sprays are used during loading of the surge bin to control fugitive dust. Dust emissions during primary crushing and transfer points within the crusher vault will be controlled with dust collection equipment (i.e., bag houses).

Storage capacity of the coarse ore stockpile would be about 75,000 tons. Fugitive dust during loading of the stockpile would be controlled with water sprays at the point where the stockpile feed conveyor dumps to the stockpile. During primary crusher down time, ore at the coarse ore stockpile would be moved from the “dead” storage area to the “live” storage area by front-end loader or bulldozer.

Two reclaim chutes beneath the coarse ore stockpile would direct ore onto apron feeders and feed ore onto a belt conveyor for transport into a large diameter semi-autogenous (SAG) mill for the first stage of grinding. Dust emissions from the reclaim operations will be controlled with dust collection equipment (i.e., bag houses).

Reduction in the SAG mill would be a result of impact between the ore chunks themselves and between the ore chunks and the 5 inch steel grinding balls used in the mill. Reduction would be a combination of crushing and attrition. Water and various chemicals/reagents would be added to the SAG mill feed to start the conditioning of the ore pulp for subsequent stages of treatment. Tonnage of the primary feed to the SAG mill would be a nominal 25,000 tons per day. The SAG mill would discharge onto a vibrating screen. Undersize crushed ore from the screen would report to a cyclone feed sump. The oversize ore would be taken by belt conveyor to a pebble crusher, where it would be crushed to less than 0.75 inch in diameter and returned by belt conveyor to the SAG mill. Oversize from the SAG mill discharge may also be diverted around the pebble crusher and returned by conveyor to the SAG mill or stockpiled. Ore from the cyclone feed sump would be pumped to a cluster of hydro-cyclones for material sizing. The fines would report to the first stage of flotation, and the oversize ore would report to the ball mill for further grinding. The ball mill discharges to a cyclone feed sump. The contents of the sump are transferred by pump to a hydrocyclone cluster. A bleed from the hydrocyclone underflow feeds a Knelson gravity concentrator to remove gravity recoverable gold before returning to the circuit. The hydrocyclone underflow reports back to the ball mill and the overflow reports to the flotation plant.

The flotation plant will consist of copper and molybdenum flotation circuits. The copper and molybdenum minerals will be concentrated in a bulk copper/moly concentrate. The moly mineral will be separated from the copper minerals in a moly flotation circuit. The bulk (copper-moly) flotation circuit will consist of rougher flotation, concentrate regrind, first cleaner /first cleaner/scavenger flotation, and second cleaner flotation. The moly flotation circuit will consist moly separation (rougher) flotation, moly first cleaner flotation, concentrate regrind, moly second cleaner flotation and moly third cleaner flotation.

Final copper concentrate will be thickened, filtered, and loaded in trucks for shipment.

Final molybdenite concentrate will be thickened, filtered, dried, and packaged into containers for shipment. Drying of the molybdenum concentrate will be done with a Holoflite type electrically heated (line power) oil that dries the molybdenum concentrate as it travels through an enclosed screw conveyor.

From the SAG mill loading to the final concentrate all processes are wet, with no expectation of particulate emissions. Fugitive emissions generated during loading of the copper concentrate in to trucks will be controlled by performing all operations in the enclosed mill building. Fugitive emissions generated during drying and loading of the molybdenum concentrate in to sacks/trucks will be controlled with a dust collection system (i.e., bag houses).

Tailings

An existing Tailings Storage Facility at Copper Flat was constructed by Quintana Minerals to serve their 1982 mining operation. The facility received 1.2 million tons of material and was essentially reclaimed in 1986. The tailings impoundment remains in place and is located southeast of the former plant site. NMCC proposes to construct a new lined Tailings Storage Facility (TSF) over the area used by previous operations for tailings disposal. Tailings would be transported from the mill via slurry pipeline and deposited in the new facility. Approximately 100 million tons of tailings are expected to be impounded over the life of the project.

Tailings from the bulk rougher flotation process are transported to the TSF where hydrocyclones are used to produce sands to build the centerline TSF dam. The cyclone overflow is deposited to the interior of the impoundment and produces a supernatant water pond that is used to reclaim water from the tailings for reuse in the milling process.

During TSF dam construction, bulldozers and compactors will be used to compact the sands used to construct the dam.

During the initial 4 years of operating the mine and mill, topsoil with be removed from the tailing area and stored in borrow storage piles adjacent to the tailing area. This activity will be performed with scrapers. It includes; scraper loading of topsoil, scraper unloading of topsoil onto the piles, and scraper travel. Fugitive dust will be controlled by watering during scraper travel.

Haul Roads and On-Site Service Roads

For the most part, existing haul roads would be utilized to haul material to the crusher, stockpiles, and WRDF. Some minor realignment of these roads may be necessary and road widths would vary. Haul roads are not expected to create new disturbances, as they would be constructed on previously disturbed land. The on-site roads would be designed for easy access and traffic movement within the operations area. Waste rock and ore would be hauled to the disposal areas and primary crusher using conventional mining haul trucks. During operation of the Copper Flat Project, water trucks would be used, as needed, to control emissions of fugitive dust from the haul roads, as well as other roads within the project area. Wetting agents and binding agents, such as magnesium chloride, may also be used to control dust if conditions warrant.

Chemicals/Reagents

Chemicals/Reagents used as part of the copper/molybdenum concentrating process would include frothers, flotation promoters, flotation collectors, flocculants, flotation reagents and pH regulators. These chemicals/reagents would be delivered by truck from commercial sources to the mine site where facilities would be provided for off-loading, storing, mixing, handling, and feeding. Chemicals/reagents that are received dry would be mixed in agitation tanks and pumped to either outdoor storage tanks or liquid storage tanks inside the concentrator building from which they would be metered into the concentrating process. Residual chemical/reagent concentrations in the tailings and reclaim water streams are expected to be present at very low levels since they would be added to water in amounts resulting in concentrations of approximately 3 parts per million (ppm). Also, normally 95 percent of the chemicals/reagents would be adsorbed onto the copper or molybdenum mineral surface and floated off in the mineral froth. The chemicals/reagents would then be subsequently consumed in the offsite smelting process. Assuming 95 percent of the chemicals/reagents are adsorbed, the residual chemicals/reagents reporting to the tailings stream drops to less than 0.15 ppm.

Frother reagents to be used at the mine include methyl isobutyl carbinol (MIBC). MIBC is biodegradable in low concentrations. The dosage rate would be 0.12 pound per ton of mill feed. The bulk of this reagent would report to the concentrate fraction and end up at the smelter. The reagent would be received in trucks and stored in a tank inside the concentrator building.

Lime used in alkalinity control in the flotation circuit would be received in pebble form in bulk by 20 ton capacity trucks and stored in a 500 ton capacity storage silo. The lime would then be slaked with water in a small mill and the resulting “milk of lime” would be pumped to the addition points in the grinding and flotation circuits for use as a pH regulator. It is anticipated that lime would be used at a rate of 2.4 pounds per ton of mill feed to control pH of the flotation circuit. During the milling process, most of the lime would react with sulfide minerals to form gypsum. The lime storage silo and associated milk of lime tanks are located outside and adjacent to the concentrator building on a concrete slab designed to accommodate secondary containment of the liquid constituents.

Ammonium Nitrate Prill is the dry component of ANFO. It will be stored in a 50 ton capacity storage silo southeast of the open pit. Annual throughput of prill will be 3,650 tons per year. Ammonium nitrate prill comes in the form of pellets. The physical properties of prill (low silt content) are conducive to minimal fugitive dust during silo loading.

Sodium hydrosulfide (NaSH) would be added to the circuit process as a moly depressant to affect the copper molybdenum separation. These chemicals/reagents are rapidly oxidized through contact with copper minerals and air bubbles entrained in flotation pulp. These chemicals/reagents would be transferred from a delivery truck to an appropriate on-site mixing and distribution tanks.

Number 2 diesel fuel would be used as a molybdenum collector. This diesel would be stored in a tank inside the concentrator building. Antiscalants such as NALCO9731, NALCO9735 (or equivalent) would be stored in tote containers, which are 250 pound double walled plastic containers that can be moved with a forklift.

Number 1 diesel fuel for mobile equipment would be stored onsite on a self-contained fuel and lube skid, including two 20,000-gallon, double-walled tanks with multiple lube and coolant capacity. This skid-mounted assembly would be staged near

the truck ready line. Diesel fuel tanks onsite would be installed in conformance with applicable New Mexico Environment Department Petroleum Storage Tank Bureau regulations for New Storage Tank Systems in 20.5.4 NMAC. As required, secondary containment shall be constructed with a capacity of at least 110% of the size of the largest AST in the containment area plus the volume displaced by the other AST(s). The geo-synthetic membrane for secondary containment shall have a minimum thickness of 60 mils.

Chemicals/reagents would be maintained in the Reagent Area of the Concentrator Building, constructed of 8" concrete block walls and a metal roof.

- Reagents such as Xantate (K.Amyl) (or equivalent): This flotation collector reagent would be kept in drums and transferred to a mixing tank, then to a holding tank, and finally to the head tank;
- AEROFLOAT 238 (also known as Butyl Dithiophospate or equivalent): used in flotation promoting, would be kept in drums and transferred to a mixing tank, then to a 6-ft diameter, 8-ft high holding tank, and finally to a 6-ft diameter, 8-ft high head tank.
- MIBC (or equivalent): MIBC would be transferred from trucks to a holding tank, and, as needed, to a head tank.
- Use of small amounts (<100 pounds) of sulfuric acid would be limited to the laboratory.
- Number 2 Diesel Fuel: For use in the copper-moly flotation process will be stored in a tank.
- Sodium Hydrosulfide: For use in the copper-moly circuit as a depressant to facilitate the separation of moly from copper are stored in a mixing and distribution tanks.

Potential reagent spills would be contained by curbs in the reagent mixing and storage areas. A floor sump pump would be used to return the spilled material either to the storage tank or into the milling process as necessary.

Estimated reagent consumption rates are presented as Table 3-1.

Table 3-1: Estimated Reagent Consumption Rates for Sulfide Ore

Item	**Rate lbs/ton ore**
Copper Circuit	
Collector, Potassium Amyl Xanthate	0.030
Collector, Butyl Dithiophosphate	0.010
Frother, Methyl Isobutyl Carbinol (MIBC)	0.12
Collector, #2 Diesel Fuel	0.1
Lime (90% CaO)	2.4
Flocculant (for Concentrate Dewatering)	0.01
Molybdenite Circuit	
Sodium Hydrosulfide	0.25
#2 Diesel Fuel	0.007
Methyl Isobutyl Carbinol (MIBC)	0.007

Air Quality Issues

The Copper Flat Project would be designed to control particulate emissions to meet all regulatory standards. As per NMED regulations, the project air quality construction permit must be authorized by the NMED prior to project commencing.

Emission rate calculations were based on an operating scenario that determines potential emissions representing a worst-case scenario from the facility. The emissions from mining and milling are based on an annual processing rate of 9,125,000 tons of ore. This is the expected amount of ore that will be processed through the mill. . Along with the ore processed through the crusher and mill will be low grade ore and waste rock handled from the pit. The amount of material delivered to the low grade ore and waste rock storage areas is based on the expected annual average amount of material handled over the life of the mine. Truck traffic estimated emissions are based on moving the material at the throughputs discussed above. Bulldozer hours of operation pushing material in the pit, at the low grade ore and waste rock stock piles, and the tailing area are based on typical mining practices at similar facilities.

Committed air quality practices would include dust control for mine unit operations. In general, the fugitive dust control program would provide for water application on haul roads and other disturbed areas; chemical dust suppressant application (such as magnesium chloride) where appropriate; and other dust control measures as per accepted and reasonable industry practice. Also, disturbed areas would be seeded with an interim seed mix to minimize fugitive dust emissions from un-vegetated surfaces where appropriate. Fugitive emissions in the process area would be controlled at the crusher, stockpile reclaimer, and conveyor drop points through the use of fugitive dust collectors. Other process areas requiring dust and/or emission controls include the concentrate drying and packaging circuit and the various process plants. Appropriate emission control equipment would be installed and operated in accordance with the air quality construction permit. The lime storage would be fitted with a dust collector for capture of fugitive dust during loading of the lime silo.

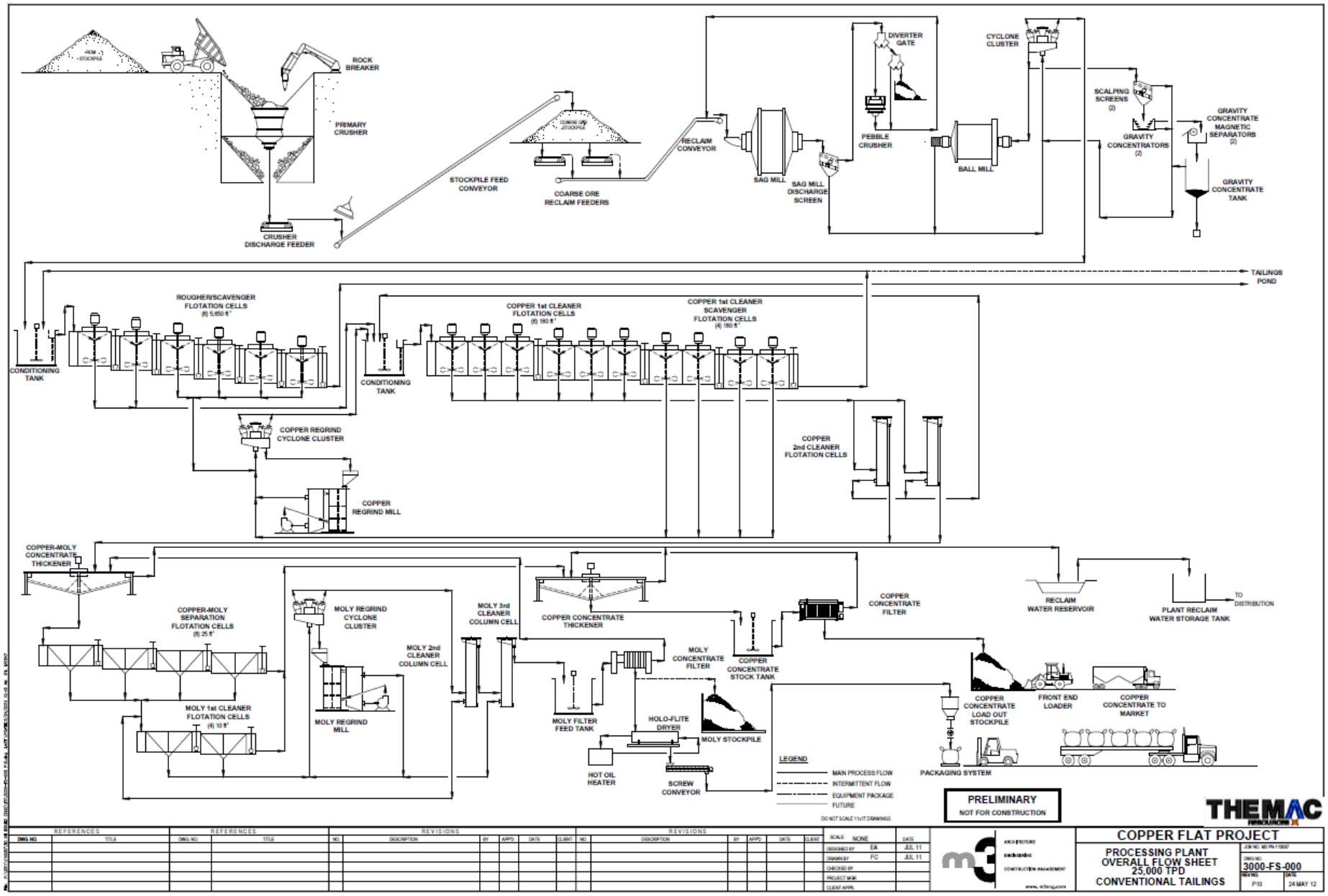
Deposition of tailings would be by spigotting and/or cyclone discharge. By this procedure, the surface would be wet, thereby eliminating or reducing fugitive dust. As necessary, control of fugitive dust in the vicinity of the TSF would be attained by watering. After reclamation, the TSF would be covered with growth medium and vegetated.

No gaseous contaminants, with the exception of blasting, are expected to be emitted to the atmosphere from the proposed stationary source operations. Drilling operations would be done wet or with other efficient dust control measures. At a minimum, haul roads, waste rock disposal areas, and ore transfer points would be wetted down on a regular basis to minimize dust emissions. Fugitive SO_2 emissions from ore and the flotation equipment are expected to be small due to the low volatility of the sulfur compounds present in the concentrate.

Section 4

Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.


ROCK BREAKER
PRIMARY CRUSHER
CRUSHER DISCHARGE FEEDER
STOCKPILE FEED CONVEYOR
COARSE ORE RECLAIM FEEDERS
RECLAIM CONVEYOR
SAG MILL
SAG MILL DISCHARGE SCREEN
DIVERTER GATE
PEBBLE CRUSHER
BALL MILL
CYCLONE CLUSTER
SCALPING SCREENS (2)
GRAVITY CONCENTRATORS (2)
GRAVITY CONCENTRATE MAGNETIC SEPARATORS (2)
GRAVITY CONCENTRATE TANK
TAILINGS POND
ROUGHER/SCAVENGER FLOTATION CELLS
CONDITIONING TANK
COPPER 1st CLEANER FLOTATION CELLS
COPPER 1st CLEANER SCAVENGER FLOTATION CELLS
CONDITIONING TANK
COPPER REGRIND CYCLONE CLUSTER
COPPER REGRIND MILL
COPPER 2nd CLEANER FLOTATION CELLS
COPPER-MOLY CONCENTRATE THICKENER
COPPER-MOLY SEPARATION FLOTATION CELLS
MOLY 1st CLEANER FLOTATION CELLS
MOLY REGRIND CYCLONE CLUSTER
MOLY REGRIND MILL
MOLY 2nd CLEANER COLUMN CELL
MOLY 3rd CLEANER COLUMN CELL
COPPER CONCENTRATE THICKENER
MOLY FILTER FEED TANK
HOLO-FLITE DRYER
HOT OIL HEATER
SCREW CONVEYOR
MOLY STOCKPILE
MOLY CONCENTRATE FILTER
COPPER CONCENTRATE STOCK TANK
COPPER CONCENTRATE FILTER
RECLAIM WATER RESERVOIR
PLANT RECLAIM WATER STORAGE TANK
TO DISTRIBUTION
COPPER CONCENTRATE LOAD OUT STOCKPILE
FRONT END LOADER
COPPER CONCENTRATE TO MARKET
PACKAGING SYSTEM
LEGEND
MAIN PROCESS FLOW
INTERMITTENT FLOW
EQUIPMENT PACKAGE
FUTURE
DO NOT SCALE 11x17 DRAWINGS
PRELIMINARY
NOT FOR CONSTRUCTION
THEMAC RESOURCES
COPPER FLAT PROJECT
PROCESSING PLANT
OVERALL FLOW SHEET
25,000 TPD
CONVENTIONAL TAILINGS
3000-FS-000
24 MAY 12

Section 5

Plot Plan Drawn To Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

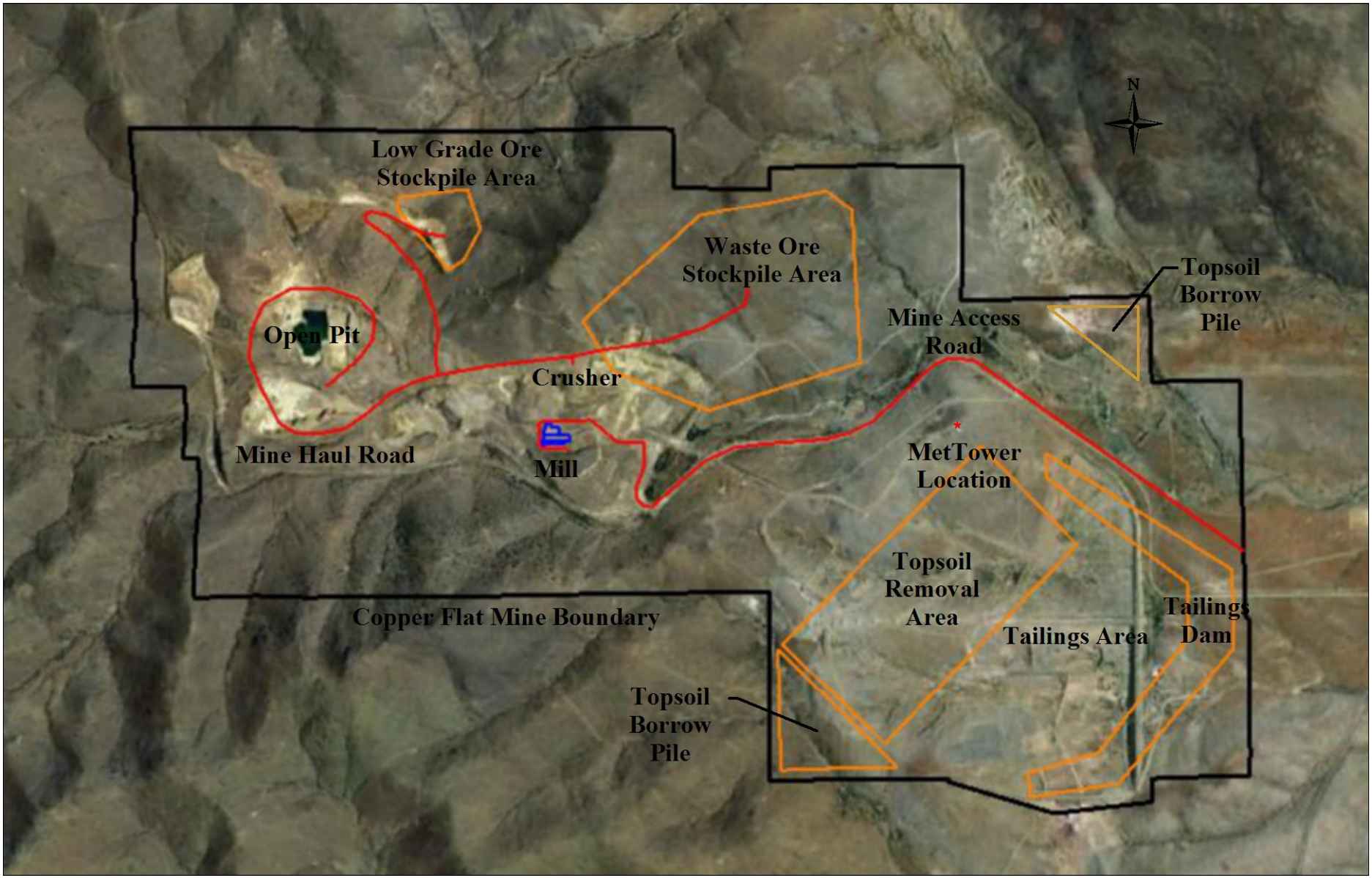


Figure 5-1: Aerial View of Copper Flat Mine Showing Mine Layout

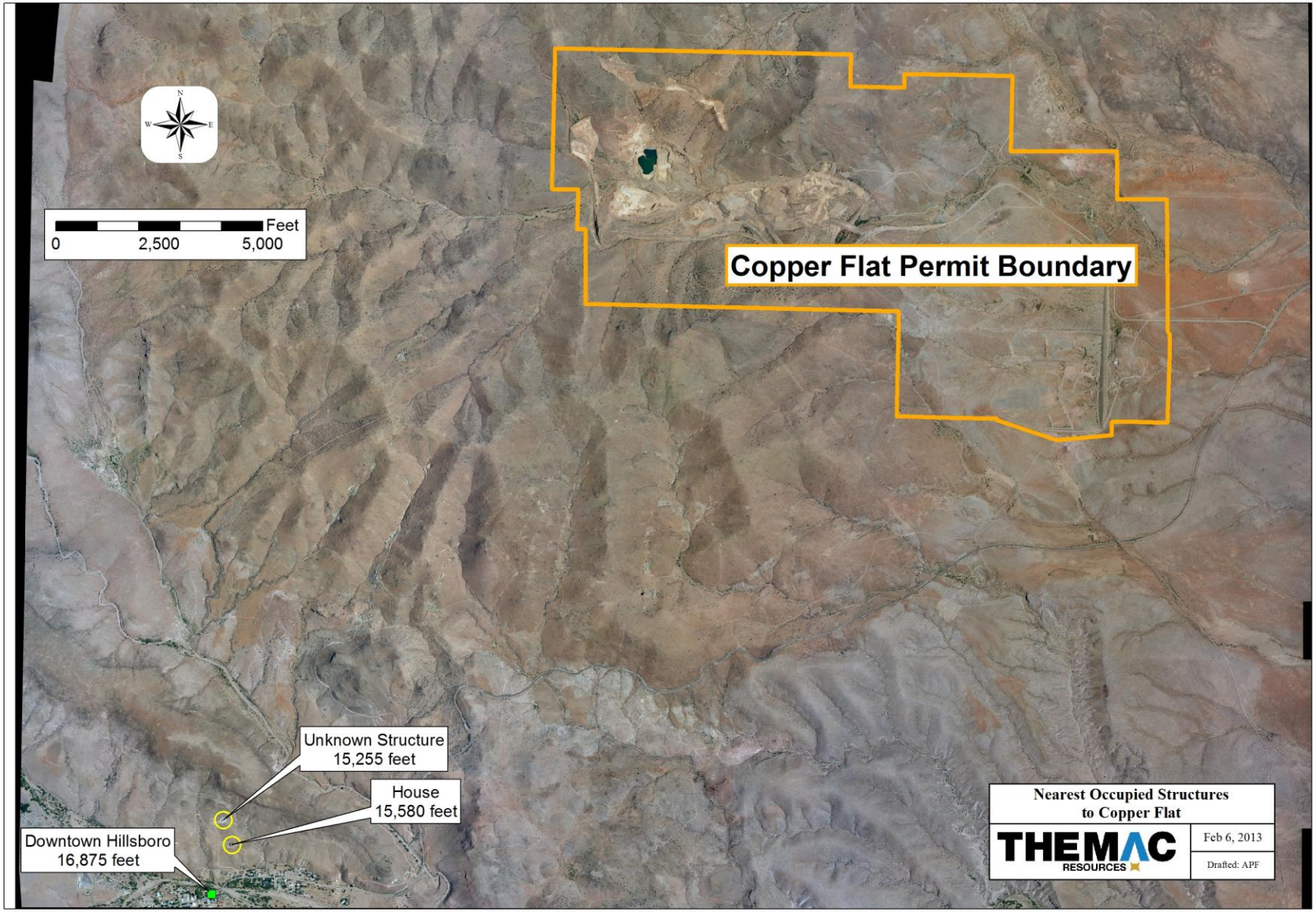


Figure 5-2: Aerial View of Copper Flat Mine Showing Mine Location and Nearest Occupied Structure

Section 6

All Calculations

Show all calculations used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

Tank Flashing Calculations: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

SSM Calculations: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.nmenv.state.nm.us/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

Glycol Dehydrator Calculations: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

Road Calculations: Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

Significant Figures:

A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.

B. At least 5 significant figures shall be retained in all intermediate calculations.

C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

(1) If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;

(2) If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**

(3) If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.

(4) The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and

20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

Pre-Control Particulate Emission Rates

Material Handling ($PM_{2.5}$, PM_{10}, and TSP)

To estimate material handling pre-control particulate emission rates for aggregate handling operations (Mine truck loading and unloading, product trucks loading, process equipment continuous and batch material transfers), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2006), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053). Wind speed for determining the hourly and annual emission rate is annual wind speed measured at Copper Flats for the year 2011 of 11.1 mph. Moisture content for run-of mine material is projected to be between the ranges of 2.2 to 3.4 percent. For determining emission rates for material handling of run-of-mine ore, the low end of the range of 2.2 percent was used. For material handled at the tailings area the moisture content is projected to be 10 percent. For copper concentrate loading into product trucks in the mill area the moisture content is projected to be 8 percent.

To estimate crushing pre-control particulate emissions rates, emission factors were obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Aug. 2004, Section 11.19.2, Table 11.19.2-2, "Tertiary Crushing". To determine missing $PM_{2.5}$ emission factors the ratio of 0.35/0.053 from $PM_{10}/PM_{2.5}$ *k* factors found in AP-42 Section 13.2.4 (11/2006) were used.

Pre-control particulate emissions rates for lime silo loading was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 11.12 (06/06), Table 11.12-2 "Cement Unloading to Elevated Storage Silo". To determine missing $PM_{2.5}$ emission factors the ratio of 0.995/0.050 from TSP/$PM_{2.5}$ uncontrolled emission equations found in AP-42 Section 11.12 (06/06), Table 11.12-3 "Cement Unloading to Elevated Storage Silo" was used.

Ore extraction at the open pit will be permitted to allow mining of 15,042,000 tons per year. Nominal daily processing through the primary crusher and mill will be permitted for 25,000 tons per day. Hourly emission rates were calculated based on the annual throughput divided by 8760 hours per year, with the exception of the lime/prill silo loading. An hourly emission rate for the lime/prill silo loading is based on the maximum loading rate of the silo at 25 tons per hour.

Aggregate Handling Operations (batch and continuous material drops) Emission Equation:

Maximum Emission Factor (run of mine material)

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(11.1/5)^{1.3}$ / $(2.2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(11.1/5)^{1.3}$ / $(2.2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11.1/5)^{1.3}$ / $(2.2/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00584 lbs/ton;

E_{PM10} (lbs/ton) = 0.00276 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.000419 lbs/ton

Maximum Emission Factor (copper concentrate)

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(11.1/5)^{1.3}$ / $(8/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(11.1/5)^{1.3}$ / $(8/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11.1/5)^{1.3}$ / $(8/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00096 lbs/ton;

E_{PM10} (lbs/ton) = 0.00045 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.000069 lbs/ton

Maximum Emission Factor (tailings area material handling)

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(11.1/5)^{1.3}$ / $(10/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(11.1/5)^{1.3}$ / $(10/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11.1/5)^{1.3}$ / $(10/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00070 lbs/ton;

E_{PM10} (lbs/ton) = 0.00033 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.000050 lbs/ton

AP-42 Emission Factors AP-42 Section 11.19.2, Table 11.19.2-2:

Raw Ore Primary Crusher = Uncontrolled Tertiary Crusher Emission Factor

AP-42 Section 11.12 Table 11.12-2 Uncontrolled Emission Factors:

Lime Silo Loading = Uncontrolled Cement Unloading to Elevated Storage Silo Emission Factor

Material Handling Emission Factors:

Process Unit	**TSP Emission Factor (lbs/ton)**	**PM_{10} Emission Factor (lbs/ton)**	**$PM_{2.5}$ Emission Factor (lbs/ton)**
Uncontrolled Run of Mine/Molybdenum Material Handling	0.00584	0.00276	0.000419
Uncontrolled Copper Concentrate Material Handling	0.00096	0.00045	0.000069
Uncontrolled Tailings Area Material Handling	0.00070	0.00033	0.000050
Uncontrolled Crusher	0.0054	0.0024	0.00036
Uncontrolled Lime Silo Loading	0.72	0.46	0.036

The following equation was used to calculate the hourly emission rate for each process unit:

Emission Rate (lbs/hour) = Process Rate (tons/hour) * Emission Factor (lbs/ton)

The following equation was used to calculate the annual emission rate for each process unit:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * \text{Operating Hour (hrs/year)}}{\text{2000 lbs/ton}}$$

Table 6-1 Pre-Controlled Material Handling Emission Rates

Unit #	Process Unit Description	Process Rate (tpy)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S4	Mine Truck Loading in Open Pit	15,042,000	10	44	4.7	21	0.72	3.1
S6	Ore Loading to Surge Bin - Crusher	9,125,000	6.1	27	2.9	13	0.44	1.9
S7	Drop to Apron Feeder from Surge Bin – Crusher	9,125,000	3.1	14	1.1	5.0	0.18	0.78
S8	Primary Crusher	9,125,000	5.6	25	2.5	11	0.38	1.6
S9	Crusher Apron Conveyor Drop	9,125,000	3.1	14	1.1	5.0	0.18	0.78
S10	Material drop to Course Ore Stockpile	9,125,000	6.1	27	2.9	13	0.44	1.9
S12	Material Drop from Course Ore Stockpile to Reclaimer	9,125,000	6.1	27	2.9	13	0.44	1.9
S13	Material Drop from Reclaimer to Reclaim Conveyor	9,125,000	6.1	27	2.9	13	0.44	1.9
S14	Reclaim Conveyor to Wet Mill	9,125,000	6.1	27	2.9	13	0.44	1.9
S15	Lime Silo Loading	10,950 tpy 25 tph	18	3.9	12	2.5	0.90	0.20
S16, S17	Molybdenum Product Drop to Pile/Bagger	930	0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S18	Copper Concentrate Drop to Pile	100,700	0.011	0.048	0.0052	0.023	0.00079	0.0035
S19	Product Truck Loading Molybdenum	930	0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S20	Product Truck Loading Copper	100,700	0.011	0.048	0.0052	0.023	0.00079	0.0035
S21	Mine Truck Unloading Low Grade Ore Stockpile	267,000	0.18	0.78	0.084	0.37	0.013	0.056
S23	Mine Truck Unloading Waste Dump Stockpile	5,650,000	3.8	17	1.8	7.8	0.27	1.2

Drilling and Blasting (S1 & S2)

As part of mining operations in the open pit, drilling and blasting will be performed. Annually, 290 blasts are estimated to occur with 100 drill holes per blast. For drilling, emissions were estimated using emission factors found in EPA's AP-42 Section 11.9 Table 11.9-4 "Drilling" (ver. 07/98) (Table 6-2). For each blast, ≈22 tons of ANFO (ammonium nitrate - fuel oil) will be used over an area of 24,600 square feet per blast. Particulate emissions per blast are estimated using emission factors from EPA's AP-42 Section 11.9, Table 11.9-1, "Blasting Overburden" (ver. 07/98) (Table 6-3). Emissions of nitrogen dioxide, carbon monoxide, and sulfur dioxide are calculated based on the tons of ANFO used and emission factors from EPA's AP-42 Section 13.3, Table 13.3-1" (ver. 02/80) (Table 6-4).

Ammonium nitrate prill comes in the form of pellets. The physical properties of prill (low silt content) are conducive to no fugitive dust during silo loading. To be conservative, emissions of particulate were estimated using EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2006), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the annual emission rate is annual wind speed measured at Copper Flats for the year 2011 of 11.1 mph, and an estimated moisture content of 1 percent.

Drilling (S1)
Particulate Emission Factor AP-42 Section 11.9 Table 11.9-4 "Drilling" (ver. 07/98)

TSP = 1.3 lbs/hole
PM_{10} = 0.67 lbs/hole
$PM_{2.5}$ = 0.136 lbs/hole; PM2.5/PM10 Ratio = 0.2

Table 6-2 Pre-Controlled Material Handling Emission Rates

Pollutant	Holes/Blast	# Blasts/Year	Emission Rate (lbs/blast)	Emission Rate (tons/yr)
TSP	100	290	130	19
PM_{10}	100	290	68	9.9
$PM_{2.5}$	100	290	14	2.0

Blasting (S2)
Particulate Emission Factor AP-42 Section 11.9, Table 11.9-1, "Blasting Overburden" (ver. 07/98)

$TSP = 0.000014(A)^{1.5}$
A = horizontal area (ft^2)
PM_{10} = TSP * 0.52
$PM_{2.5}$ = TSP * 0.03

Table 6-3 Pre-Controlled Material Handling Emission Rates

Pollutant	Area/Blast (ft^2)	# Blasts/Year	Emission Rate (lbs/blast)	Emission Rate (tons/yr)
TSP	24,600	290	54	7.8
PM_{10}	24,600	290	28	4.1
$PM_{2.5}$	24,600	290	1.6	0.24

Combustion Emission Factor AP-42 Section 13.3, Table 13.3-1" (ver. 02/80)

NOx = 17 lbs/ton of ANFO
CO = 67 lbs/ton of ANFO
SO_2 = 2 lbs/ton of ANFO

Table 6-4 Pre-Controlled Material Handling Emission Rates

Pollutant	Emission Factor (lbs/ton ANFO)	Tons of ANFO/Blast	Tons of ANFO/Year	Emission Rate (lbs/blast)	Emission Rate (tons/yr)
NOx	17	22	6400	375	54
CO	67	22	6400	1479	214
SO_2	2	22	6400	44	6.4

Prill Silo Loading and Unloading (S3)

Particulate Emission Equation Section 13.2.4 (11/2006). Ammonium nitrate prill will be loaded into a 500 ton capacity silo and then unloaded into blasting trucks. The process will pneumatically load the prill into the silo and gravity feed into the blasting trucks. Prill is a low percent silt content with an expected percent moisture content of 1 percent.

<u>Prill Handling Operations (each silo loading and unloading) Emission Equation:</u>

Maximum Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(11.1/5)^{1.3}$ / $(1/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(11.1/5)^{1.3}$ / $(1/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11.1/5)^{1.3}$ / $(1/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.01762 lbs/ton;

E_{PM10} (lbs/ton) = 0.00834 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00126 lbs/ton

Table 6-5 Pre-Controlled Prill Handling Emission Rates

Unit #	Process Unit Description	Process Rate (tpy)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S3	Prill Silo Loading and Unloading	3,650 tpy 25 tph	0.88	0.064	0.42	0.030	0.063	0.0046

Unpaved Road Truck Travel (Units S29 & S30)

One of the main sources of particulate matter emissions for any copper mine is haul truck traffic fugitive road dust. For Copper Flats Mine, haul truck travel emissions were estimated using AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation. Five main types of traffic can be found operating at the mine: mine haul trucks moving raw ore from the open pit to the primary crusher surge bin or other surge storage pile; mine haul trucks moving waste ore from the open pit to the waste dump; mine haul trucks moving low grade ore from the open pit to the low grade stock pile; product trucks hauling processed material off site; and mine operation vehicles or contractors servicing mining operations by light vehicles. The emission equation from AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation is as follows:

$$E = k * (s/12)^a * (W/3)^b * [(365 - p)/365] * VMT$$

Where k = constant PM2.5 = 0.15
PM10 = 1.5
TSP = 4.9
s = % silt content (Table 13.2.2-1, "Haul road to/from pit" 8.4%; "Plant road" 5.1%)
W = mean vehicle weight (see following discussion)
p = number of days with at least 0.01 in of precip. (Figure 13.2.2-3 = 60 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
TSP = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
TSP = 0.45
VMT = Vehicle Miles Traveled (see following discussion)

Reduction in emissions due to precipitation was only accounted for in the annual emission rate.

Annual Precipitation Reduction Equation = [(365-p)/365]

One of the inputs to the emission equation for unpaved road particulate matter emissions is vehicle miles traveled (VMT). For haul roads this is based on the amount of material transported per year and the capacity of the haul truck. For the light vehicles it is based on the expected annual miles per vehicle on mine plant roads. For haul truck moving raw ore from the open pit, material is transported to one of three locations; primary crusher, low grade ore stock pile, or waste ore stock pile. The following is the number of trip calculations used in determining haul truck VMT for material transport on the mine.

	%	Load Capacity (Tons)	TPY	Trips/Yr
Primary Crusher Haul	100%	100	9125000	91250
Low Grade Ore Stock Pile Haul	100%	100	267000	2670
Waste Stock Pile Haul	100%	100	5650000	56500
			Total Ore Haul	**150420**

For haul truck transporting product or delivering chemicals, material is transported from the mill to the mine exit. The following is the number of trip calculations used in determining product haul truck VMT for material transport off the mine site.

	%	Load Capacity (Tons)	TPY	Trips/Yr
Copper Concentrate Haul	100%	25	100700	4028
Molybdenum Concentrate Haul	100%	25	930	37.2
Chemical Delivery Haul	100%	25	12319	492.8
		Total Product/Chemical Haul		**4558**

Based on the number of haul truck trips and the length of the round trip travel for each delivery site, the total haul road VMT was calculated.

Route	RT Mileage	Trucks/Yr	VMT/Yr
Ore Haul from Open Pit to Crusher	3.34929	91250	305642.6
Ore Haul from Open Pit to Low Grade	3.99565	2670	10669.2
Ore Haul from Open Pit to Waste	4.32443	56500	244336.8
	Total Haul Trucks	**150420**	**560648.6**

Light vehicles VMT is based on the expected mile per year for each light vehicle/maintenance truck. This is summarized below.

Type	Vehicle #s	VMT/yr/truck	VMT/yr
Light Vehicle	5	10000	50000

Based on the number of product/chemical truck trips and the length of the round trip travel for each transport, the product/chemical haul road VMT was calculated.

Route	RT Mileage	Trucks/Yr	VMT/Yr
Copper Concentrate Haul	4.84276	4028	19507
Molybdenum Concentrate Haul	4.84276	37.2	180.2
Chemical Delivery Haul	4.84276	492.8	2286.5
	Total Haul Trucks	**4558**	**22073.3**

The average weight of ore haul trucks is based on average truck unloaded weight of 50 tons, the load size of 100 tons. The average weight of light vehicle trucks is 10 tons. Normalized weight (W) is calculated below and input into each of the two types of road equations, haul truck and light vehicles.

Route	Mean Weight (tons)	VMT/Yr	Weight * VMT
Ore Haul from Open Pit to Crusher	100	305642. 6	30564260
Ore Haul from Open Pit to Low Grade	100	10669.2	1066920
Ore Haul from Open Pit to Waste	100	244336.8	24433368
Light Vehicle	10	50000	500000
		610649.6	56564856
	Normalized Weight		92.63
Copper Concentrate Haul	27.5	19506.6	536431.5
Molybdenum Concentrate Haul	27.5	108.2	2975.5
Chemical Delivery Haul	27.5	2286.5	62878.8
		22073.3	607015.8
	Normalized Weight		27.5

The following is the results of the emission equation with input of normalized vehicle weight and percent silt content for the two types of roads, for both maximum hourly emission rate and annual emission rate.

Haul Truck Traffic

Hourly Emission Rate Factor
TSP = 17.86899 lbs/VMT
PM10 = 5.09348 lbs/VMT
PM2.5 = 0.50935 lbs/VMT

Annual Emission Rate Factor
TSP = 14.93162 lbs/annual VMT
PM10 = 4.25620 lbs/annual VMT
PM2.5 = 0.425621 lbs/annual VMT

Product/Chemical Truck Traffic

Hourly Emission Rate Factor
TSP = 7.29564 lbs/VMT
PM10 = 1.88207 lbs/VMT
PM2.5 = 0.18821 lbs/VMT

Annual Emission Rate Factor
TSP = 6.09636 lbs/annual VMT
PM10 = 1.57269 lbs/annual VMT
PM2.5 = 0.15727 lbs/annual VMT

Hourly emissions were calculated by multiplying the annual VMT by the hourly emission rate factor and dividing by 8760 hours per year. Annual emissions were calculated by multiplying the annual VMT by the annual emission rate factor and dividing by 2000 pounds/ton.

Table 6-6 summarizes the unpaved road emission rates for San Juan Mine haul truck traffic and light vehicle traffic.

Table 6-6: Pre-Controlled Haul Road Fugitive Dust Emission Rates

Unit #	Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S29	Haul Trucks / Light Vehicles	610649 miles/yr	1246	4559	355	1300	36	130
S30	Product/Chemical Trucks	22073 miles/yr	18	67	4.7	17	0.47	1.7

Unpaved Road Maintenance (Unit S31)

Unpaved roads are maintained using a road grader. To account for particulate matter emissions from road graders an emission equation from AP-42, Section 11.9 (ver.10/98) Table 11.9-1 "Grading" was used.

AP-42 Section 11.9, Table 11.9-2 "Grading"

E_{TSP} = 0.040 $(S)^{2.5}$ lb/VMT
E_{PM10} = (0.60) (0.051) $(S)^{2.0}$ lb/VMT
E_{PM10} = (0.031) 0.040 $(S)^{2.5}$ lb/VMT
Vehicle Speed (S) = 5 MPH
Operational Hours = 5000 hours/yr
VMT = 5 MPH * 5000 Hours/yr = 25,000 VMT/yr

E_{TSP} = 0.040 $(5)^{2.5}$ lb/VMT
= 2.23607 lb/VMT

E_{PM10} = (0.60) (0.051) $(5)^{2.0}$ lb/VMT
= 0.76500 lb/VMT

E_{PM10} = (0.031) 0.040 $(5)^{2.5}$ lb/VMT
= 0.06932 lb/VMT

Hourly emissions were calculated by multiplying the emission rate factor by the MPH of the grader. Annual emissions were calculated by multiplying the emission rate factor by the annual VMT and dividing by 2000 pounds/ton.

Table 6-7: Pre-Controlled Unpaved Road Maintenance Fugitive Dust Emission Rates

Unit #	Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S31	Grader	25,000 miles/yr	11	28	3.8	9.6	0.35	0.87

Bulldozer Operations (Units S5, S11, S22, S24, S25)

Material moved during mining operations, course ore storage pile maintenance, low grade ore storage pile maintenance, and waste ore storage pile maintenance is performed by bulldozers. This particulate matter emission source accounts for a majority of the particulate emissions at the mine. From AP-42 Section 11.9, Table 11.9-1 "Bulldozing" an emission equation is found for moving overburden.

Ore (Overburden)

AP-42 Section 11.9, Table 11.9-2

E_{TSP} = (5.7) $(s)^{1.2}/(M)^{1.3}$ lb/hr
E_{PM10} = (0.75) (1.0) $(s)^{1.5}/(M)^{1.4}$ lb/hr
$E_{PM2.5}$ = (0.105) (5.7) $(s)^{1.2}/(M)^{1.3}$ lb/hr
s = % Silt Content
M = % Moisture Content

These emission equations include three inputs; percent silt content of the material moved, percent moisture of the material moved, and the annual hours the bulldozers are moving material. Percent silt content for overburden was obtained from AP-42 Section 11.9, Table 11.9-3 "Overburden". Percent moisture content for raw ore material is the NMED default of 2 %. Percent moisture content for tailings area material is the design value after dewatering the material in the cyclones.

Material	% Silt Content	% Moisture Content
Open Pit Ore	6.9	2.2
Tailings Area	6.9	10.0

Bulldozers annual hours of operation were estimated by the mine design group. Each bulldozer will be on call to operate 24 hours per day. During the hours the engine is operating the bulldozer is idle, the operator is filling out paperwork, machine maintenance is performed, or the bulldozer is pushing material. Below is a summary of the hours of operation for each area where bulldozers will operate.

Source Description	Process Area Worked	Daily Metered (Hours)	Actual Material Moving (%)	Pushing Annual (Hours)
Open Pit Mine	Position Material for Loading	24	45%	3942
Course Ore Stock Pile	Maintain Stock Pile	24	33%	2891
Low Grade Ore Stock Pile	Maintain Stock Pile	16	33%	1927
Waste Ore Stock Pile	Maintain Stock Pile	24	33%	2891
Tailings Area	Construct Tailings Dam	24	33%	2891

Raw Ore

AP-42 Section 11.9, Table 11.9-2

E_{TSP} = (5.7) $(6.9)^{1.2}/(2.2)^{1.3}$ lb/hr = 20.77 lbs/hr

E_{PM10} = (0.75) (1.0) $(6.9)^{1.5}/(2.2)^{1.4}$ lb/hr = 4.51 lbs/hr

$E_{PM2.5}$ = (0.105) (5.7) $(6.9)^{1.2}/(2.2)^{1.3}$ lb/hr = 2.18 lbs/hr

Tailings Area

AP-42 Section 11.9, Table 11.9-2

E_{TSP} = (78.4) $(6.9)^{1.2}/(10.0)^{1.3}$ lb/hr = 2.90 lbs/hr

E_{PM10} = (0.75) (18.6) $(6.9)^{1.5}/(10.0)^{1.4}$ lb/hr = 0.54 lbs/hr

$E_{PM2.5}$ = (0.022) (78.4) $(6.9)^{1.2}/(10.0)^{1.3}$ lb/hr = 0.30 lbs/hr

Annual emissions where calculated by multiplying the hourly emission rate by the annual operating hours and dividing by 2000 pounds/ton.

Table 6-8: Pre-Controlled Bulldozer Fugitive Dust Emission Rates

Unit #	Process Unit Description	Process Rate (Hours)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S5	Open Pit Mine	3942	21	41	4.5	8.9	2.2	4.3
S11	Course Ore Stock Pile	2891	21	30	4.5	6.5	2.2	3.2
S22	Low Grade Ore Stock Pile	1927	21	20	4.5	4.3	2.2	2.1
S24	Waste Ore Stock Pile	2891	21	30	4.5	6.5	2.2	3.2
S25	Tailings Area	3504	2.9	4.2	0.54	0.78	0.30	0.44

Topsoil Removal in Tailing Area (S26, S27, S28)

Scrapers will be used to move topsoil from the tailing area to borrow storage piles for use at end of mine as cover for the tailing area during reclamation. Three particulate emission sources are identified for this operation; scraper loading, scraper travel, and scraper unloading. Emission factor for scraper loading is found in AP-42, Section 11.9 (ver.10/98) Table 11.9-4 "Topsoil removal by scraper". For scraper travel, the emission equation from AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation was used. For scraper unloading, the emission equation from AP-42, Section 13.2.4 (11/2006), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053) was used. The amount of material that will be moved is equal to 780,000 tons over a four year period or 195,000 tons per year.

Scraper Loading (S26)

Emission factor for scraper loading is found in AP-42, Section 11.9 (ver.10/98) Table 11.9-4 is:

TSP = 0.058 lbs/ton of topsoil moved

For PM10 and PM2.5, the k factor found in AP-42 Section 13.2.4 was used to ratio from TSP to PM10 and PM2.5. The k factor found in AP-42 section 13.2.4 are TSP = 0.74, PM_{10} = 0.35, and $PM_{2.5}$ = 0.053. So;

PM10 = 0.058 lbs/ton * 0.35/0.74 = 0.0274 lbs/ton of topsoil moved
PM2.5 = 0.058 lbs/ton * 0.053/0.74 = 0.00415 lbs/ton of topsoil moved

The amount of material that will be moved is equal to 780,000 tons over a four year period or 195,000 tons per year.

Scraper Unloading (S27)

Emission equation for scraper unloading is found in AP-42, Section 13.2.4 (11/2006) is:

$E\ (lbs/ton) = k \times 0.0032 \times (U/5)^{1.3} / (M/2)^{1.4}$

Where: k = particle size multiplier
U = windspeed,
M = % Moisture Content

For scraper unloading, the wind speed for determining the hourly and annual emission rate is annual wind speed measured at Copper Flats for the year 2011 of 11.1 mph, and the percent moisture content was the NMED default of 2 percent.

<u>Scraper Unloading Operations Emission Equation:</u>

Maximum Emission Factor

$E\ (lbs/ton) = k \times 0.0032 \times (U/5)^{1.3} / (M/2)^{1.4}$
$E_{TSP}\ (lbs/ton) = 0.74 \times 0.0032 \times (11.1/5)^{1.3} / (2/2)^{1.4}$
$E_{PM10}\ (lbs/ton) = 0.35 \times 0.0032 \times (11.1/5)^{1.3} / (2/2)^{1.4}$
$E_{PM2.5}\ (lbs/ton) = 0.053 \times 0.0032 \times (11.1/5)^{1.3} / (2/2)^{1.4}$
E_{TSP} (lbs/ton) = 0.00668 lbs/ton;
E_{PM10} (lbs/ton) = 0.00316 lbs/ton
$E_{PM2.5}$ (lbs/ton) = 0.000478 lbs/ton

Scraper Travel (S28)

For scraper travel, the emission equation from AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation was used.

$$E = k * (s/12)^a * (W/3)^b * [(365 - p)/365] * VMT$$

Where k = constant PM2.5 = 0.15
PM10 = 1.5
TSP = 4.9
s = % silt content (Table 11.9-3, "Scraper" 16.4%)
W = mean vehicle weight (37 tons)
p = number of days with at least 0.01 in of precip. (Figure 13.2.2-3 = 60 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
TSP = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
TSP = 0.45
VMT = Vehicle Miles Traveled (see following discussion)

Three equation inputs are used in the emission equation; mean vehicle weight, route percent silt content, and vehicle miles traveled. The mean vehicle weight is based on the unloaded weight (12 tons) and the loaded weight (62 tons) or 37 tons. The route percent silt content is found in AP-42 Section 11.9, Table 11.9-3 of 16.4%.

Vehicle miles traveled (VMT) was determined by calculating the number of trip the scrapers would need to move the material annually and the distance traveled in travel mode per trip. The number of trips was based on 50 tons of material moved per trip and 195,000 tons of topsoil moved per year or 3,900 trips per year. The distance traveled per trip is 800 meter one way or 0.9944 miles per round trip. The VMT is then 3878 miles per year.

Scraper Travel

Hourly Emission Rate Factor
TSP = 18.88627 lbs/VMT
PM10 = 6.15423 lbs/VMT
PM2.5 = 0.61542 lbs/VMT

Annual Emission Rate Factor
TSP = 15.78167 lbs/annual VMT
PM10 = 5.14258 lbs/annual VMT
PM2.5 = 0.51426 lbs/annual VMT

Table 6-9: Pre-Controlled Scraper Fugitive Dust Emission Rates

Unit #	Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S26	Scraper Loading	195000 tons	1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading	195000 tons	0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel	3878 mile/yr	8.4	31	2.7	10	0.27	1.0

Wind Erosion Particulate Emissions Coal Storage Pile and Active Disturbed Areas (Units S32 – S36)

Fugitive particulate emissions generated by wind speeds high enough to cause wind erosion were calculated by using the equations and procedures found in AP-42 Section 13.2.5.

The erosion potential function for a dry, exposed surface is:

$$P = k * 58 (u^* - u_t^*)^2 + 25 (u^* - u_t^*)$$

$$P = 0 \text{ for } u^* \leq u_t^*$$

where:

u^* = friction velocity (m/s)

u_t^* = threshold friction velocity (m/s)

k = (TSP = 1); (PM10 = 0.5); (PM2.5 = 0.075)

Information input into the analysis for wind erosion include; the area of the erodible source, the roughness length of the erodible material, the threshold friction velocity of the erodible material, the daily fastest mile of wind (time it takes for 1 mile of wind to travel 1 mile or maximum daily 2-minute wind speed), erodible area shape (pile or flat), and frequency of disturbance. Emissions generated by wind erosion are also dependent on the frequency of disturbance of the erodible surface, because each time that a surface is disturbed, its erosion potential is restored. A disturbance is defined as an action that results in the exposure of fresh surface material to the entire area.

Five areas are identified as sources of erodible material that are frequently disturbed:

1) Course Ore Pile – Ore located in the course ore storage pile after primary crushing.
2) Open Pit Disturbed Area – Area involving the open pit that is disturbed by mining.
3) Low Grade Ore Storage Area – Disturbed area involving the storage of low grade ore.
4) Waste Dump Storage Area – Disturbed area involving the storage of waste ore.
5) Tailings Area – Disturbed area involving the tailing dam and stored tailings.

Roughness length and threshold friction velocity for each area were obtained from Table 13.2.5-2 for the respective erodible material. For raw ore processing areas Table 13.2.5-2 "Overburden" was used. For the tailings area Table 13.2.5-2 "Uncrusted coal pile" was used.

Wind Erosion Area	Area (m^2)	Material	Threshold Friction Velocity (m/s)	Roughness Height (cm)	Frequency of Disturbance (days)
Course Ore Pile Wind Erosion	4,641	Overburden	1.02	0.3	3
Open Pit Area Wind Erosion	684,000	Overburden	1.02	0.3	3
Low Grade Ore Area Wind Erosion	275,196	Overburden	1.02	0.3	7
Waste Dump Area Wind Erosion	849,870	Overburden	1.02	0.3	7
Tailings Area Wind Erosion	2,213,709	Uncrusted coal pile	1.12	0.3	7

Fastest mile data was obtained from "Local Climatologically Data" LCD for Albuquerque in 2011. To represent the fastest mile, the maximum daily 2-minute wind speed was input into the wind erosion equation to determine if the wind speed was high enough to generated wind erosion emissions.

For flat areas or flat piles, u^* is determined by multiplying the u_{10} by 0.053 as found in the equation below.

$$u^* = u_{10} * 0.053$$

where:
u^* = friction velocity (m/s).
u_{10} = fastest mile of 10 meters for period between disturbances (m/s).

For conical piles (Course Ore Pile), u^* is determined by multiplying u_{10} by the pile regime ratio ($u_r/u_{s)}$ and then by 0.1 as found in the equation below.

$$u^* = u_{10} * (u_r/u_{s)} * 0.1$$

where:
u^* = friction velocity (m/s).
u_{10} = fastest mile of 10 meters for period between disturbances (m/s).
u_r/u_s = conical pile regime ratio
(0.2 regime for 40% of surface area , 0.6 regime for 48% of surface area, and 0.9 regime for 12% of surface area).

Hourly emission rates were calculated by dividing the annual pounds per year emission rate by 8760 hours per year. Annual emission rates were calculated by dividing the annual pounds per year emission rate by 2000 pounds/ton.

Wind erosion particulate matter emissions are calculated on a separate emissions spreadsheet and are summarized below in Table 6-10.

Table 6-10: Pre-Controlled Wind Erosion Particulate Emission Rates

Unit #	Process Unit Description	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S32	Course Ore Pile Wind Erosion	0.25	1.1	0.12	0.54	0.018	0.081
S33	Open Pit Area Wind Erosion	3.2	14	1.6	7.0	0.24	1.0
S34	Low Grade Ore Area Wind Erosion	1.3	5.6	0.64	2.8	0.096	0.42
S35	Waste Dump Area Wind Erosion	3.9	17	2.0	8.6	0.30	1.3
S36	Tailings Area Wind Erosion	3.3	14	1.6	7.2	0.25	1.1

Controlled Particulate Emission Rates

No controls or emission reductions are proposed for the following sources.

Source ID	Source Description
S1	Drilling
S2	Blasting
S3	Prill Silo Loading
S4	Truck Loading at Open Pit
S5	Bulldozing at Open Pit
S21	Truck Unloading at Low Grade Ore Storage Pile
S22	Bulldozing at Low Grade Ore Storage Pile
S23	Truck Unloading at Waste Ore Storage Pile
S24	Bulldozing at Waste Ore Storage Pile
S25	Bulldozing at Tailings Area
S26	Scraper Loading
S27	Scraper Unloading
S31	Road Maintenance - Grader
S32	Course Ore Pile Wind Erosion
S33	Open Pit Area Wind Erosion
S34	Low Grade Ore Area Wind Erosion
S35	Waste Dump Area Wind Erosion
S36	Tailings Area Wind Erosion

Controlled Material Handling ($PM_{2.5}$, PM_{10}, and TSP)

Particulate emissions controls for the following sources include passive enclosures or water/chemical suppressant sprays.

Source ID	Source Description
S6	Ore Loading into Primary Crusher Surge Bin
S10	Conveyor Drop to Course Ore Storage Pile
S11	Course Ore Pile Maintenance - Bulldozer
S18	Conveyor Drop to Copper Concentrate Storage Pile
S20	Product Truck Loading of Copper Concentrate

For ore loading into primary crusher surge bin and conveyor drop to course ore storage pile, direct application of water by water sprays will be used to control fugitive dust. Based on a document from "Mojave Desert Air Quality Management District, Antelope Valley Air Pollution Control District, Emissions Inventory Guidance, Mineral Handling and Processing Industries, April 10, 2000, Table 5", the estimated control efficiency for direct application of water is 75 percent.

For conveyor drop to copper concentrate storage pile, the area is fully enclosed within the mill building. For product truck loading of copper concentrate, the loading area is partially enclosed (3/4 when truck entrance doors are open) within the mill building. Based on a document from "Mojave Desert Air Quality Management District, Antelope Valley Air Pollution Control District, Emissions Inventory Guidance, Mineral Handling and Processing Industries, April 10, 2000, Table 5", the estimated control efficiency for passive full enclosure is 85 percent and for passive ¾ enclosure is 70 percent.

The controlled hourly and annual emissions where calculated by using the following equations.

Uncontrolled emission rate * (1 - %control efficiency/100) = Controlled emission rate

Table 6-11 Controlled Material Handling Emission Rates

Unit #	Process Unit Description	Control Efficiency (%)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S6	Ore Loading to Surge Bin - Crusher	75	1.5	6.7	0.72	3.2	0.11	0.48
S10	Material drop to Course Ore Stockpile	75	1.5	6.7	0.72	3.2	0.11	0.48
S18	Copper Concentrate Drop to Pile	85	0.0017	0.0072	0.00078	0.0034	0.00012	0.00052
S20	Product Truck Loading Copper	70	0.0033	0.014	0.0016	0.0069	0.00024	0.0010

Estimate for Controlled Bulldozer Operations (Unit S11)

Material moved during course ore storage pile maintenance is performed by bulldozers. Control for bulldozer activities on the course ore pile is obtained by moisture added for control during pile loading. From AP-42 Section 11.9, Table 11.9-1 "Bulldozing" an emission equation is found for moving overburden.

Ore (Overburden)

AP-42 Section 11.9, Table 11.9-2

$E_{TSP} = (5.7)\ (s)^{1.2}/(M)^{1.3}$ lb/hr

$E_{PM10} = (0.75)\ (1.0)\ (s)^{1.5}/(M)^{1.4}$ lb/hr

$E_{PM2.5} = (0.105)\ (5.7)\ (s)^{1.2}/(M)^{1.3}$ lb/hr

s = % Silt Content

M = % Moisture Content

These emission equations include three inputs; percent silt content of the material moved, percent moisture of the material moved, and the annual hours the bulldozers are moving material. Percent silt content for overburden was obtained from AP-42 Section 11.9, Table 11.9-3 "Overburden". Percent moisture content for course ore pile material is the high moisture content for "wet suppression" from note b in AP-42 Section 11.19.2 Table 11.19.2-2.

Material	% Silt Content	% Moisture Content
Course Ore Pile	6.9	2.88

Bulldozers annual hours of operation were estimated by the mine design group

Source Description	Process Area Worked	Daily Meter (Hours)	Actual Material Moving (%)	Annual (Hours)
Course Ore Stock Pile	Maintain Stock Pile	24	33%	2891

Raw Ore

AP-42 Section 11.9, Table 11.9-2

$E_{TSP} = (5.7)\ (6.9)^{1.2}/(2.88)^{1.3}$ lb/hr = 14.63 lbs/hr

$E_{PM10} = (0.75)\ (1.0)\ (6.9)^{1.5}/(2.88)^{1.4}$ lb/hr = 3.09 lbs/hr

$E_{PM2.5} = (0.105)\ (5.7)\ (6.9)^{1.2}/(2.88)^{1.3}$ lb/hr = 1.54 lbs/hr

Annual emissions where calculated by multiplying the hourly emission rate by the annual operating hours and dividing by 2000 pounds/ton.

Table 6-12: Controlled Course Ore Pile Bulldozer Fugitive Dust Emission Rates

Unit #	Process Unit Description	Process Rate (Hours)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S11	Course Ore Stock Pile	2891	15	21	3.1	4.5	1.5	2.2

Estimates for Permit Allowable Dust Control Dust Collectors (PM2.5, PM10, and TSP)

Four dust collectors will control emissions at four sources; primary crusher, course ore storage pile reclaimer, molybdenum processing circuit, and lime silo loading. The primary crusher dust collector will control fugitive dust generated in the underground crusher vault, consisting of Units S7 – S9. The course ore storage pile reclaimer dust collector will control fugitive dust generated in the underground reclaimer vault and tunnel, consisting of Units S12 & S13. The molybdenum processing circuit dust collector will control fugitive dust generated in mill to capture molybdenum product, consisting of Units S16, S17 & S19. The lime silo loading dust collector will control fugitive dust generated during loading of the lime silo, consisting of Unit S15. To estimate permit allowable particulate matter emission rates the filter manufacturers' expected outlet grain loading rate of 0.01 grain/cubic foot was used.

Source ID	Process Unit Description	Flow Rate (ACFM)
S7, S8, S9	Primary Crusher Vault	12,000
S12, S13	Reclaimer Vault	12,000
S16, S17, S19	Molybdenum Mill Area	12,000
S15	Lime Silo Loading	500

To be conservative, for all dust collectors, TSP = PM_{10} = $PM_{2.5}$.

The following equation was used to calculate the controlled particulate emission rate from the mill dust control baghouse:

$$\frac{0.01\ grains}{cf}\ X\ \frac{lb}{7000\ grains}\ X\ \frac{60\ \text{min}.}{hr}\ X\ \frac{Exhaust\ cf}{\text{min}.} = Emission\ Rate\ lbs/hr$$

The following equation was used to calculate the annual emission rate for the primary crusher vault collector, reclaimer vault collector, and molybdenum mill area based on operating 8760 hours per year:

$$\text{Emission Rate (tons/year)} = \frac{\text{Controlled Emission Rate (lbs/hour) * Operating Hour (hrs/year)}}{\text{2000 lbs/ton}}$$

For the prill and lime silo loading, operating hours are based on the hours it takes to load the annual throughput at 25 tons per hour. The annual throughputs for the prill and lime silo are 3,650 and 10,950 tons per year. The hours of operation for the prill and lime silo are 146 and 438 hours per year.

Table 6-13: Permit Allowable Dust Control Baghouse Particulate Emission Rates

Unit #	Process Unit Description	Flow Rate (ACFM)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S7, S8, S9	Primary Crusher Vault Dust Collector	12,000	1.0	4.5	1.0	4.5	1.0	4.5
S12, S13	Reclaimer Vault Dust Collector	12,000	1.0	4.5	1.0	4.5	1.0	4.5
S16, S17, S19	Molybdenum Mill Area Dust Collector	12,000	1.0	4.5	1.0	4.5	1.0	4.5
S15	Lime Silo Loading Dust Collector	500	0.043	0.0094	0.043	0.0094	0.043	0.0094

Controlled Unpaved Road Traffic

Haul truck travel emissions were estimated using AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation. Unpaved road traffic includes haul truck roads transporting raw ore from the open pit and light vehicles used haul roads, and product/chemical delivery trucks on mine access road. Fugitive dust control for haul roads is the application of water by water truck and/or surfactants. Fugitive dust control for access roads is the application of base course and water by water truck, NMED default control percentage of 80%. Percent control efficiency for the haul roads is estimated by the use of percent control efficiency equation found in MRI "Control of Open Fugitive Dust Source" EPA-450/3-88-008, Section 3.3.3.1 Watering. The equation is presented below:

%CE = 100-(0.8*p*d*t)/i

p = Class A Pan Evaporation Rate (mm/hr)
d = Average hourly daytime traffic rate (hr^-1)
t = time between application (hr)
i = application intensity (L/m3)

Socorro Class A Pan Evaporation Rate for 1926 - 2005 = 56.44 inches/yr
Evaporation occurred during middle 8 months or 5856 hour/year
p = 56.44 in/yr / 5856 hr/yr * 25.4 mm/inch = 0.2448 mm/hr

Control of haul roads was determined in the following calculations:

Haul Truck Trips per Year =	150420	truck/yr
d = 150420 /8760 =	17.17	truck/hr
Water Truck 20,000 gallons		
Gallons/application = 20000 gal/load * 2 load/application	40000	gallons/application
	151416	Liters/application
t = 12 applications/day over 24 hours =	2	hr
Road Length		
Haul Road =	4535	meter
road width =	33	meter
road area =	149655	sq. meters
i = gal/load / road sq. meters	1.01	L/m2/application
%CE = 100-(0.8*p*d*t)/i	93	%

Reduction in emissions due to precipitation was only accounted for in the annual emission rate. Particulate emission rate per vehicle mile traveled for each particle size category is:

Haul Truck Traffic

Hourly Emission Rate Factor Haul Roads 93% Control
TSP = 1.25083 lbs/VMT
PM10 = 0.35654 lbs/VMT
PM2.5 = 0.03565 lbs/VMT

Annual Emission Rate Factor Haul Roads 93% Control
TSP = 1.04521 lbs/annual VMT
PM10 = 0.29793 lbs/annual VMT
PM2.5 = 0.02979 lbs/annual VMT

Product/Chemical Truck Traffic

Hourly Emission Rate Factor Product/Chemical Access Roads 80% Control
TSP = 1.45913 lbs/VMT
PM10 = 0.37641 lbs/VMT
PM2.5 = 0.03764 lbs/VMT

Annual Emission Rate Factor Product/Chemical Access Roads 80% Control
TSP = 1.21927 lbs/annual VMT
PM10 = 0.31454 lbs/annual VMT
PM2.5 = 0.03145 lbs/annual VMT

The controlled hourly and annual emissions where calculated by using the following equations.

Uncontrolled emission rate * (1 - %control efficiency/100) = Controlled emission rate

Table 6-14 summarizes the unpaved road emission rates for Copper Flats Mine haul truck traffic and product/chemical access traffic.

Table 6-14: Controlled Haul Road Fugitive Dust Emission Rates

Unit #	Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S29	Haul Trucks / Light Vehicles	610649 miles/yr	87	319	25	91	2.5	9.1
S30	Product/Chemical Trucks	21946 miles/yr	3.7	13	0.95	3.5	0.095	0.35

Controlled Scraper Travel (S28)

Reduction in emissions due to precipitation was only accounted for in the annual emission rate. Particulate emission rate per vehicle mile traveled for each particle size category is:

Haul Truck Traffic

Hourly Emission Rate Factor Haul Roads 93% Control
TSP = 1.25083 lbs/VMT
PM10 = 0.35654 lbs/VMT
PM2.5 = 0.03565 lbs/VMT

Annual Emission Rate Factor Haul Roads 93% Control
TSP = 1.04521 lbs/annual VMT
PM10 = 0.29793 lbs/annual VMT
PM2.5 = 0.02979 lbs/annual VMT

Product/Chemical Truck Traffic

Hourly Emission Rate Factor Product/Chemical Access Roads 80% Control
TSP = 1.45913 lbs/VMT
PM10 = 0.37641 lbs/VMT
PM2.5 = 0.03764 lbs/VMT

Annual Emission Rate Factor Product/Chemical Access Roads 80% Control
TSP = 1.21927 lbs/annual VMT
PM10 = 0.31454 lbs/annual VMT
PM2.5 = 0.03145 lbs/annual VMT

The controlled hourly and annual emissions where calculated by using the following equations.

Uncontrolled emission rate * (1 - %control efficiency/100) = Controlled emission rate

Table 6-13 summarizes the unpaved road emission rates for Copper Flats Mine haul truck traffic and product/chemical access traffic.

Table 6-13: Controlled Haul Road Fugitive Dust Emission Rates

Unit #	Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
S28	Scraper Travel	3878 miles/yr	3.3	12	1.1	4.0	0.11	0.40

Table 6-14 Plant-Wide Uncontrolled Particulate Emission Rates

Source ID	Source Description	Uncontrolled					
		TSP		PM10		PM2.5	
		(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
S1	Drilling – Open Pit	5.4	19	2.8	9.9	0.57	2.0
S2	Blasting – Open Pit	54	7.8	28	1.2	1.6	0.068
S3	Prill Silo Loading	0.88	0.064	0.42	0.030	0.063	0.0046
S4	Truck Loading - Open Pit	10	44	4.7	21	0.72	3.1
S5	Bulldozer – Open Pit	21	41	4.5	8.9	2.2	4.3
S6	Raw Ore Unloading to Surge Bin	6.1	27	2.9	13	0.44	1.9
S7	Drop from Surge Bin to Apron Feeder	3.1	14	1.1	5.0	0.18	0.78
S8	Primary Crusher	5.6	25	2.5	11	0.38	1.6
S9	Primary Crusher Apron Conveyor TP	3.1	14	1.1	5.0	0.18	0.78
S10	Stacker Conveyor Drop to Course Ore Storage Pile	6.1	27	2.9	13	0.44	1.9
S11	Bulldozer Maintenance of Course Ore Storage Pile	21	30	4.5	6.5	2.2	3.2
S12	Course Ore Storage Pile Drop to Reclaimer	6.1	27	2.9	13	0.44	1.9
S13	Reclaimer Drop to Reclaim Conveyor	6.1	27	2.9	13	0.44	1.9
S14	Reclaim Conveyor Drop to Wet Mill	6.1	27	2.9	13	0.44	1.9
S15	Lime Silo Loading	18	3.9	12	2.5	0.90	0.20
S16	Drop to Molybdenum Storage Pile	0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S17	Drop to Molybdenum Bagger						
S18	Drop to Copper Concentrate Storage Pile	0.011	0.048	0.0052	0.023	0.00079	0.0035
S19	Product Loading Trucks Molybdenum	0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S20	Product Loading Trucks Copper Concentrate	0.011	0.048	0.0052	0.023	0.00079	0.0035
S21	Truck Unloading Low Grade Ore Stockpile	0.18	0.78	0.084	0.37	0.013	0.056
S22	Bulldozer Low Grade Ore Stockpile Area	21	20	4.5	4.3	2.2	2.1
S23	Truck Unloading Waste Dump Stockpile	3.8	17	1.8	7.8	0.27	1.2
S24	Bulldozer Waste Dump Stockpile Area	21	30	4.5	6.5	2.2	3.2
S25	Bulldozer Tailings Dam Area	2.9	4.2	0.54	0.78	0.30	0.44
S26	Scraper Loading Tailings Area	1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading Tailings Area	0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel Mode	8.4	31	2.7	10	0.27	1.0
S29	Truck Traffic Mine Trucks/Light Vehicles	1246	4559	355	1300	36	130
S30	Truck Traffic Product/Chemical Delivery Trucks	18	67	4.7	17	0.47	1.7
S31	Grader – Road Maintenance	11	28	3.8	9.6	0.35	0.87
S32	Wind Erosion Course Ore Pile	0.25	1.1	0.12	0.54	0.018	0.081
S33	Wind Erosion Open Pit Area	3.2	14	1.6	7.0	0.24	1.0
S34	Wind Erosion Low Grade Ore Stockpile Area	1.3	5.6	0.64	2.8	0.10	0.42

Table 6-14 Plant-Wide Uncontrolled Particulate Emission Rates

Source ID	Source Description	Uncontrolled					
		TSP		PM10		PM2.5	
		(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
S35	Wind Erosion Waste Dump Stockpile Area	3.9	17	2.0	8.6	0.30	1.3
S36	Wind Erosion Tailings Area	3.3	14	1.6	7.2	0.25	1.1
	Total	**1518**	**5145**	**460**	**1519**	**54**	**170**

Table 6-15 Plant-Wide Controlled Particulate Emission Rates

Source ID	Source Description	Controlled					
		TSP		PM10		PM2.5	
		(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
S1	Drilling – Open Pit	5.4	19	2.8	9.9	0.57	2.0
S2	Blasting – Open Pit	54	2.3	28	1.2	1.6	0.068
S3	Prill Silo Loading	0.88	0.064	0.42	0.030	0.063	0.0046
S4	Truck Loading - Open Pit	10	44	4.7	21	0.72	3.1
S5	Bulldozer – Open Pit	21	41	4.5	8.9	2.2	4.3
S6	Raw Ore Unloading to Surge Bin	1.5	6.7	0.72	3.2	0.11	0.48
S7	Drop from Surge Bin to Apron Feeder	1.0	4.5	1.0	4.5	1.0	4.5
S8	Primary Crusher						
S9	Primary Crusher Apron Conveyor TP						
S10	Stacker Conveyor Drop to Course Ore Storage Pile	1.5	6.7	0.72	3.2	0.11	0.48
S11	Bulldozer Maintenance of Course Ore Storage Pile	15	21	3.1	4.5	1.5	2.2
S12	Course Ore Storage Pile Drop to Reclaimer	1.0	4.5	1.0	4.5	1.0	4.5
S13	Reclaimer Drop to Reclaim Conveyor						
S14	Reclaim Conveyor Drop to Wet Mill	0.23	1.0	0.11	0.47	0.016	0.072
S15	Lime Silo Loading	0.043	0.0094	0.043	0.0094	0.043	0.0094
S16	Drop to Molybdenum Storage Pile	1.0	4.5	1.0	4.5	1.0	4.5
S17	Drop to Molybdenum Bagger						
S19	Product Loading Trucks Molybdenum						
S18	Drop to Copper Concentrate Storage Pile	0.0017	0.0072	0.00078	0.0034	0.00012	0.00052
S20	Product Loading Trucks Copper Concentrate	0.0033	0.014	0.0016	0.0069	0.00024	0.0010
S21	Truck Unloading Low Grade Ore Stockpile	0.18	0.78	0.084	0.37	0.013	0.056
S22	Bulldozer Low Grade Ore Stockpile Area	21	20	4.5	4.3	2.2	2.1
S23	Truck Unloading Waste Dump Stockpile	3.8	17	1.8	7.8	0.27	1.2
S24	Bulldozer Waste Dump Stockpile Area	21	30	4.5	6.5	2.2	3.2
S25	Bulldozer Tailings Dam Area	2.9	4.2	0.54	0.78	0.30	0.44
S26	Scraper Loading Tailings Area	1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading Tailings Area	0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel Mode	3.3	12	1.1	4.0	0.11	0.40
S29	Truck Traffic Mine Trucks/Light Vehicles	87	319	25	91	2.5	9.1
S30	Truck Traffic Product/Chemical Delivery Trucks	3.7	13	0.95	3.5	0.095	0.35
S31	Grader – Road Maintenance	11	28	3.8	9.6	0.35	0.87
S32	Wind Erosion Course Ore Pile	0.25	1.1	0.12	0.54	0.018	0.081
S33	Wind Erosion Open Pit Area	3.2	14	1.6	7.0	0.24	1.0

Table 6-15 Plant-Wide Controlled Particulate Emission Rates

Source ID	Source Description	Controlled					
		TSP		PM10		PM2.5	
		(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
S34	Wind Erosion Low Grade Ore Stockpile Area	1.3	5.6	0.64	2.8	0.10	0.42
S35	Wind Erosion Waste Dump Stockpile Area	3.9	17	2.0	8.6	0.30	1.3
S36	Wind Erosion Tailings Area	3.3	14	1.6	7.2	0.25	1.1
	Total	**279**	**657**	**97**	**222**	**19**	**48**

Table 6-15 Plant-Wide NOx, CO, SO_2 Emission Rates

Source ID	Source Description	Blasting Combustion Emissions		
		NOx	CO	SO_2
		TPY	TPY	TPY
S2	Blasting	54	214	6.4

HAPS/TAPS EMISSION SOURCES

There are no significant sources of HAPS at the Copper Flat Mine facility. There are three potential sources of TAP (Toxic Air Pollutant) emissions from the Copper Flat Mine facility. These emissions sources are copper dust contained in particulate emissions from copper ore processing and concentrating, insoluble Mo compounds contained in particulate emissions from molybdenum ore processing and concentrating, and calcium oxide particulate emissions in lime additive during copper ore concentrating.

Particulate Matter Sources (TAPS – copper dust, calcium oxide (lime))

Copper dust
The raw ore processed from the Copper Flat Mine mining operation has a typical copper content of 0.45 percent (as Cu).

The total controlled TSP emissions from raw ore processing units (S8, S9, S10, S12, S13, S14) are:

Total TSP emissions are:

TSP (lbs/hr) = 3.84 lbs/hr
TSP (tpy) = 16.82 tpy

The copper dust content of these particulate emissions is:

3.84 lbs TSP/hr * 0.0045 lbs Cu/lb TSP = 0.017 lbs/hr Cu
16.82 tpy TSP * 0.0045 ton Cu/ton TSP = 0.076 tpy Cu

The total controlled TSP emission of copper concentrate (S18, S20) is:

TSP (lbs/hr) = 0.0050 lbs/hr
TSP (tpy) = 0.022 tpy

Therefore, total facility-wide emissions of Mo are:

0.017 lbs/hr + 0.0050 lbs/hr = 0.022 lbs/hr
0.076 tpy + 0.022 tpy = 0.098 tpy

20.2.72.502 NMAC lists the emission rate screening level for copper dust at 0.0667 lbs/hr. The total facility-wide emissions of copper dust from Copper Flat Mine are below the screening level, so no further analysis is required.

Insoluble Mo Compounds
The raw ore processed from the Copper Flat Mine mining operation has a typical molybdenum content of 0.01 percent (as Mo).

The total controlled TSP emissions from raw ore processing units (S8, S9, S10, S12, S13, S14) are:

Total TSP emissions are:

TSP (lbs/hr) = 3.84 lbs/hr
TSP (tpy) = 16.82 tpy

The molybdenum dust content of these particulate emissions is:

3.84 lbs TSP/hr * 0.0001 lbs Mo/lb TSP = 0.00038 lbs/hr Mo
16.82 tpy TSP * 0.0001 ton Mo/ton TSP = 0.0017 tpy Mo

The total controlled TSP emission of molybdenum concentrate (S16, S17, S19) is:

TSP (lbs/hr) = 1.0 lbs/hr
TSP (tpy) = 4.5 tpy

Therefore, total facility-wide emissions of Mo are:

0.00038 lbs/hr + 1.0 lbs/hr = 1.00038 lbs/hr

0.0017 tpy + 4.5 tpy = 4.5017 tpy

20.2.72.502 NMAC lists the emission rate screening level for insoluble Mo compounds at 0.667 lbs/hr. The total facility-wide emissions of insoluble Mo compounds from Copper Flat Mine are above the screening level, so the release height correction factor in 20.2.72.502 NMAC Table C was used. Most of the emissions of insoluble Mo compounds are from S16, S17, and S18 exiting Stack 3 (99.9%). For this stack, the release height is 12.2 meters or a correction factor of 5 from Table C. Using the correction factor, the corrected screening level is then:

0.667 lbs/hr * 5 = 3.335 lbs/hr

The insoluble Mo compounds emission rate of 1.00038 lbs/hr from Copper Flat Mine is below the screening level, so no further analysis is required.

Lime (Calcium Oxide)

Lime is used as an additive at the ore concentration area (S15). The sum of the controlled hourly emission rates for particulate matter (TSP) is.

0.043 lbs/hr

0.0094 tpy

20.2.72.502 NMAC lists the emission rate screening level for calcium oxide at 0.133 lbs/hr. The total facility-wide emissions of calcium oxide from Copper Flat Mine are below the screening level, so no further analysis is required.

Section 7

Information Used To Determine Emissions

<u>Information Used to Determine Emissions</u> shall include the following:

- ✔ If manufacturer data are used, include specifications for emissions units <u>and</u> control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- ☐ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- ✔ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- ☐ If an older version of AP-42 is used, include a complete copy of the section.
- ✔ If an EPA document or other material is referenced, include a complete copy.
- ☐ Fuel specifications sheet.
- ☐ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

		File Name:
Dust Collectors:	Manufacture Grain Loading	A-XXXX-7-Filters
Drilling:	AP-42 Section 11.9	A-XXXX-7-AP42S11-9
Blasting:	AP-42 Section 11.9	A-XXXX-7-AP42S11-9
Blasting:	AP-42 Section 13.3	A-XXXX-7-AP42S13-3
Bulldozers:	AP-42 Section 11.9	A-XXXX-7-AP42S11-9
Scrapers:	AP-42 Section 11.9	A-XXXX-7-AP42S11-9
Graders:	AP-42 Section 11.9	A-XXXX-7-AP42S11-9
Material Processing:	AP-42 Section 11.19.2	A-XXXX-7-AP42S11-19-2
Silo Loading	AP-42 Section 11.12	A-XXXX-7-AP42S11-12
Unpaved Roads:	AP-42 Section 13.2.2	A-XXXX-7-AP42S13-2-2
Material Handling:	AP-42 Section 13.2.4	A-XXXX-7-AP42S13-2-4
Wind Erosion:	AP-42 Section 13.2.5	A-XXXX-7-AP42S13-2-5
Wind Erosion:	Fastest Mile Data Alb 2011	A-XXXX-7-FastestMileAlb2011
Wind Erosion:	Wind Erosion Spreadsheet	A-XXXX-7-WindErosionAlb2011
Emission Inventory:	EI Excel Spreadsheet	A-XXXX-7-ExcelSpreadsheet
Control Efficiency:	Mojave AQMD Mining Document	A-XXXX-7-Mojave
Haul Road Control Efficiency:	MRI EPA-450/3-88-008	A-XXXX-7-HaulRoadControl
MSDS Data Sheets:	MRI EPA-450/3-88-008	A-XXXX-7-MSDS

DEPARTMENT of ENVIRONMENTAL PROTECTION BUREAU
of NEW SOURCE REVIEW
CONTROL DATA SHEET
DUST COLLECTOR

MANUFACTURER: _____WAM_____

MODEL: _____FC.2.J.13_____

SPECIFY _____ BAGHOUSE
__X__ CARTRIDGE
_____ OTHER _____

NUMBER OF BAGS OR CARTRIDGES: __8_____

SIZE OF BAG OR CARTRIDGE: _____5.25" X 36"_____

TOTAL BAG OR CARTRIDGE AREA (FT2) ____135FT2_____

MAXIMUN CAPACITY (ACFM) _____740_____

BAG OR CARTRIDGE FABIX _____SPUNBOUND POLYESTER_____

FABRIC WEIGHT (oz) _____8_____

WEAVE _____10 MICRON_____

FINISH _____COATED_____

MAXIMUM FABRIC TEMPERTURE _____160 DEGREES (F)_____

EFFICINCY (%) _____99.9_____

AIR TO CLOTH RATIO _____5.5:1_____

METHOD OF CLEANING: _____ REVERSE AIR
___X__ PULSE JET
_____ SHAKER

OPERATING PRESSURE DROP: MIN __4___ MAX ___8__ (INCHES OF WATER)

PARTICULATE GRAIN LOADING: INLET __30_ OUTLET _.01_

FAN REUIRMENTS HP _____
SCFM _____
VENTING ___X_

Table 11.9-1 (English Units). EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES[a]

Operation	Material	Emissions By Particle Size Range (Aerodynamic Diameter)[b,c]				Units	EMISSION FACTOR RATING
		Emission Factor Equations		Scaling Factors			
		TSP ≤30 µm	≤15 µm	≤10 µm[d]	≤2.5 µm/TSP[e]		
Blasting[f]	Coal or overburden	$0.000014(A)^{1.5}$	ND	0.52[e]	0.03	lb/blast	C_DD
Truck loading	Coal	$\frac{1.16}{(M)^{1.2}}$	$\frac{0.119}{(M)^{0.9}}$	0.75	0.019	lb/ton	BBCC
Bulldozing	Coal	$\frac{78.4\ (s)^{1.2}}{(M)^{1.3}}$	$\frac{18.6\ (s)^{1.5}}{(M)^{1.4}}$	0.75	0.022	lb/hr	CCDD
	Overburden	$\frac{5.7\ (s)^{1.2}}{(M)^{1.3}}$	$\frac{1.0\ (s)^{1.5}}{(M)^{1.4}}$	0.75	0.105	lb/hr	BCDD
Dragline	Overburden	$\frac{0.0021\ (d)^{1.1}}{(M)^{0.3}}$	$\frac{0.0021\ (d)^{0.7}}{(M)^{0.3}}$	0.75	0.017	lb/yd^3	BCDD
Vehicle traffic[g]							
Grading		$0.040\ (S)^{2.5}$	$0.051\ (S)^{2.0}$	0.60	0.031	lb/VMT	CCDD
Active storage pile[h] (wind erosion and maintenance)	Coal	0.72 u	ND	ND	ND	$\frac{lb}{(acre)(hr)}$	C[i]_ _ _

[a] Reference 1, except as noted. VMT = vehicle miles traveled. ND = no data. Quality ratings coded where "Q, X, Y, Z" are ratings for ≤30 µm, ≤15 µm, ≤10 µm, and ≤2.5 µm, respectively. See also note below.

[b] Particulate matter less than or equal to 30 µm in aerodynamic diameter is sometimes termed "suspendable particulate" and is often used as a surrogate for TSP (total suspended particulate). TSP denotes what is measured by a standard high volume sampler (see Section 13.2).

[c] Symbols for equations:

A = horizontal area (ft^2), with blasting depth ≤ 70 ft. Not for vertical face of a bench.
M = material moisture content (%)
s = material silt content (%)
u = wind speed (mph)
d = drop height (ft)
W = mean vehicle weight (tons)
S = mean vehicle speed (mph)
w = mean number of wheels

Table 11.9-1 (cont.).

[d] Multiply the ≤15-µm equation by this fraction to determine emissions, except as noted.
[e] Multiply the TSP predictive equation by this fraction to determine emissions.
[f] Blasting factor taken from a reexamination of field test data reported in Reference 1. See Reference 4.
[g] To estimate emissions from traffic on unpaved surfaces by vehicles such as haul trucks, light-to-medium duty vehicles, or scrapers in the travel mode, see the unpaved road emission factor equation in AP-42 Section 13.2.2.
[h] Coal storage pile factor taken from Reference 5. To estimate emissions on a shorter time scale (e. g., worst-case day), see the procedure presented in Section 13.2.5.
[i] Rating applicable to mine types I, II, and IV (see Tables 11.9-5 and 11.9-6).

Note: Section 234 of the Clean Air Act of 1990 required EPA to review and revise the emission factors in this Section (and models used to evaluate ambient air quality impact), to ensure that they did not overestimate emissions from western surface coal mines. Due to resource and technical limitations, the haul road emission factors were isolated to receive the most attention during these studies, as the largest contributor to emissions. Resultant model evaluation with revised emission factors have improved model prediction for total suspended particulate (TSP); however, there is still a tendency for overprediction of particulate matter impact for PM-10, for as yet undetermined causes, prompting the Agency to make a policy decision not to use them for regulatory applications to these sources. However, the technical consideration exists that no better alternative data are currently available and the information should be made known. Users should accordingly use these factors with caution and awareness of their likely limitations.

Table 11.9-3 (Metric And English Units). TYPICAL VALUES FOR CORRECTION FACTORS APPLICABLE TO THE PREDICTIVE EMISSION FACTOR EQUATIONS[a]

Source	Correction Factor	Number Of Test Samples	Range	Geometric Mean	Units
Blasting	Area blasted	17	100 – 6,800	1,590	m^2
	Area blasted	17	1100 – 73,000	17,000	ft^2
Coal loading	Moisture	7	6.6 - 38	17.8	%
Bulldozers					
Coal	Moisture	3	4.0 - 22.0	10.4	%
	Silt	3	6.0 - 11.3	8.6	%
Overburden	Moisture	8	2.2 - 16.8	7.9	%
	Silt	8	3.8 - 15.1	6.9	%
Dragline	Drop distance	19	1.5 - 30	8.6	m
	Drop distance	19	5 - 100	28.1	ft
	Moisture	7	0.2 - 16.3	3.2	%
Scraper	Silt	10	7.2 - 25.2	16.4	%
	Weight	15	33 - 64	48.8	Mg
	Weight	15	36 - 70	53.8	ton
Grader	Speed	7	8.0 - 19.0	11.4	kph
	Speed		5.0 - 11.8	7.1	mph
Haul truck	Silt content	61	1.2 – 19.2	4.3	%
	Moisture	60	0.3 – 20.1	2.4	%
	Weight	61	20.9 – 260	110	mg
	Weight	61	23.0 – 290	120	ton

[a] Reference 1,6.

Table 11.9-4 (English And Metric Units). UNCONTROLLED PARTICULATE EMISSION FACTORS FOR OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES

Source	Material	Mine Location[a]	TSP Emission Factor[b]	Units	EMISSION FACTOR RATING
Drilling	Overburden	Any	1.3	lb/hole	C
			0.59	kg/hole	C
	Coal	V	0.22	lb/hole	E
			0.10	kg/hole	E
Topsoil removal by scraper	Topsoil	Any	0.058	lb/ton	E
			0.029	kg/Mg	E
		IV	0.44	lb/ton	E
			0.22	kg/Mg	E
Overburden replacement	Overburden	Any	0.012	lb/ton	C
			0.0060	kg/Mg	C
Truck loading by power shovel (batch drop)[c]	Overburden	V	0.037	lb/ton	E
			0.018	kg/Mg	E
Train loading (batch or continuous drop)[c]	Coal	Any	0.028	lb/ton	E
			0.014	kg/Mg	E
		III	0.0002	lb/ton	E
			0.0001	kg/Mg	E
Bottom dump truck unloading (batch drop)[c]	Overburden	V	0.002	lb/ton	E
			0.001	kg/Mg	E
	Coal	IV	0.027	lb/ton	E
			0.014	kg/Mg	E
		III	0.005	lb/ton	E
			0.002	kg/Mg	E
		II	0.020	lb/ton	E
			0.010	kg/Mg	E
		I	0.014	lb/T	E
			0.0070	kg/Mg	E
		Any	0.066	lb/T	D
			0.033	kg/Mg	D

13.3 Explosives Detonation

13.3.1 General[1-5]

This section deals mainly with pollutants resulting from the detonation of industrial explosives and firing of small arms. Military applications are excluded from this discussion. Emissions associated with the manufacture of explosives are treated in Section 6.3, "Explosives".

An explosive is a chemical material that is capable of extremely rapid combustion resulting in an explosion or detonation. Since an adequate supply of oxygen cannot be drawn from the air, a source of oxygen must be incorporated into the explosive mixture. Some explosives, such as trinitrotoluene (TNT), are single chemical species, but most explosives are mixtures of several ingredients. "Low explosive" and "high explosive" classifications are based on the velocity of explosion, which is directly related to the type of work the explosive can perform. There appears to be no direct relationship between the velocity of explosions and the end products of explosive reactions. These end products are determined primarily by the oxygen balance of the explosive. As in other combustion reactions, a deficiency of oxygen favors the formation of carbon monoxide and unburned organic compounds and produces little, if any, nitrogen oxides. An excess of oxygen causes more nitrogen oxides and less carbon monoxide and other unburned organics. For ammonium nitrate and fuel oil (ANFO) mixtures, a fuel oil content of more than 5.5 percent creates a deficiency of oxygen.

There are hundreds of different explosives, with no universally accepted system for classifying them. The classification used in Table 13.3-1 is based on the chemical composition of the explosives, without regard to other properties, such as rate of detonation, which relate to the applications of explosives but not to their specific end products. Most explosives are used in 2-, 3-, or 4-step trains that are shown schematically in Figure 13.3-1. The simple removal of a tree stump might be done with a 2-step train made up of an electric blasting cap and a stick of dynamite. The detonation wave from the blasting cap would cause detonation of the dynamite. To make a large hole in the earth, an inexpensive explosive such as ANFO might be used. In this case, the detonation wave from the blasting cap is not powerful enough to cause detonation, so a booster must be used in a 3- or 4-step train. Emissions from the blasting caps and safety fuses used in these trains are usually small compared to those from the main charge, because the emissions are roughly proportional to the weight of explosive used, and the main charge makes up most of the total weight. No factors are given for computing emissions from blasting caps or fuses, because these have not been measured, and because the uncertainties are so great in estimating emissions from the main and booster charges that a precise estimate of all emissions is not practical.

13.3.2 Emissions And Controls[2,4-6]

Carbon monoxide is the pollutant produced in greatest quantity from explosives detonation. TNT, an oxygen-deficient explosive, produces more CO than most dynamites, which are oxygen-balanced. But all explosives produce measurable amounts of CO. Particulates are produced as well, but such large quantities of particulate are generated in the shattering of the rock and earth by the explosive that the quantity of particulates from the explosive charge cannot be distinguished. Nitrogen oxides (both nitric oxide [NO] and nitrogen dioxide [NO_2]) are formed, but only limited data are available on these emissions. Oxygen-deficient explosives are said to produce little or no

Table 13.3-1 (Metric And English Units). EMISSION FACTORS FOR DETONATION OF EXPLOSIVES

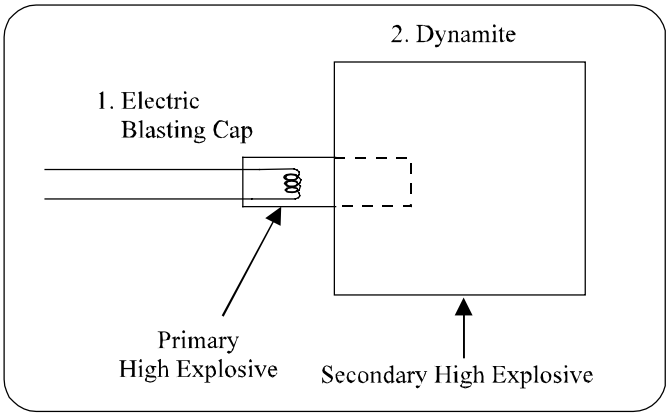
EMISSION FACTOR RATING: D

Explosive	Composition	Uses	Carbon Monoxide[a]		Nitrogen Oxides[a]		Methane[b]		Other		
			kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	Pollutant	kg/Mg	lb/ton
Black powder[2]	75/15/10; Potassium (sodium) nitrate/ charcoal sulfur	Delay fuses	85 (38-120)	170 (76-240)	ND	ND	2.1 (0.3-4.9)	4.2 (0.6-9.7)	H_2S	12 (0-37)	24 (0-73)
Smokeless powder[2]	Nitrocellulose (sometimes with other materials)	Small arms, propellant	38 (34-42)	77 (68-84)	ND	ND	0.6 (0.4-0.6)	1.1 (0.7-1.5)	H_2S	10 (10-11)	21 (20-21)
									Pb	—[c]	—[c]
Dynamite, straight[2]	20-60% Nitroglycerine/ sodium nitrate/ wood pulp/ calcium carbonate	Rarely used	141 (44-262)	281 (87-524)	ND	ND	1.3 (0.3-2.8)	2.5 (0.6-5.6)	H_2S	3 (0-7)	6 (0-15)
Dynamite, ammonia[2]	20-60% Nitroglycerine/ ammonium nitrate/sodium nitrate/wood pulp	Quarry work, stump blasting	32 (23-64)	63 (46-128)	ND	ND	0.7 (0.3-1.1)	1.3 (0.6-2.1)	H_2S	16 (9-19)	31 (19-37)
Dynamite, gelatin[2]	20-100% Nitroglycerine	Demolition, construction work, blasting in mines	52 (13-110)	104 (26-220)	26 (4-59)	53 (8-119)	0.3 (0.1-0.8)	0.7 (0.3-1.7)	H_2S	2 (0-3)	4 (0-6)
									SO_2	1 (0-8)	1 (1-16)

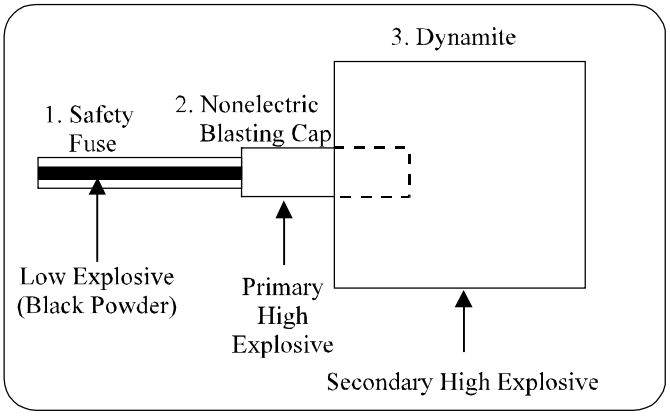
Table 13.3-1 (cont.).

Explosive	Composition	Uses	Carbon Monoxide[a]		Nitrogen Oxides[a]		Methane[b]		Other		
			kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	Pollutant	kg/Mg	lb/ton
ANFO[4,5]	Ammonium nitrate with 5.8-8% fuel oil	Construction work, blasting in mines	34	67	8	17	ND	ND	SO_2	1 (0-2)	2 (1-3)
TNT[2]	Trinitrotoluene	Main charge in artillery projectiles, mortar rounds, etc.	398 (324-472)	796 (647-944)	ND	ND	7.2 (6.6-7.7)	14.3 (13.2-15.4)	NH_3 HCN C_2H_2 C_2H_6	14 (14-15) 13 (11-16) 61 0.5	29 (27-30) 27 (22-32) 121 1.1
RDX[3]	$(CH_2)_3N_3(NO_2)_3$ Cyclotri-methylene-trinitroamine	Booster	98[d] (2.8-277)	196[d] (5.6-554)	ND	ND	ND	ND	NH_3	22[d] (12-61)	44[d] (24-122)
PETN[2]	$C(CH_2ONO_2)_4$ Pentaerythritol tetranitrate	Booster	149 (138-160)	297 (276-319)	ND	ND	ND	ND	NH_3	1.3 (0-25)	2.5 (0-5)

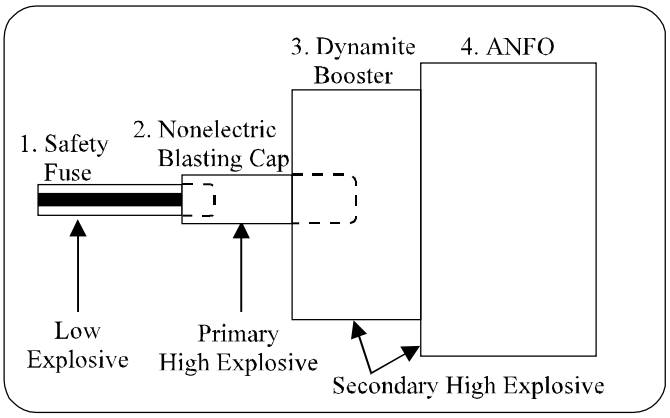
[a] Based on experiments carried out prior to 1930 except in the case of ANFO, TNT, and PETN. ND = no data.
[b] The factors apply to the chemical species, methane. They do not represent total volatile organic compounds (VOC) expressed as methane. Studies were carried out more than 40 years ago.
[c] Greater than 6 mg per 158 grain projectile (0.6 kg/Mg, 1.2 lb/ton).
[d] These factors are derived from theoretical calculations, not from experimental data.



a. Two-step explosive train



b. Three-step explosive train



c. Four-step explosive train

Figure 13.3-1. Two-, three-, and four-step explosive trains.

nitrogen oxides, but there is only a small body of data to confirm this. Unburned hydrocarbons also result from explosions, but in most instances, methane is the only species that has been reported.

Hydrogen sulfide, hydrogen cyanide, and ammonia all have been reported as products of explosives use. Lead is emitted from the firing of small arms ammunition with lead projectiles and/or lead primers, but the explosive charge does not contribute to the lead emissions.

The emissions from explosives detonation are influenced by many factors such as explosive composition, product expansion, method of priming, length of charge, and confinement. These factors are difficult to measure and control in the field and are almost impossible to duplicate in a laboratory test facility. With the exception of a few studies in underground mines, most studies have been performed in laboratory test chambers that differ substantially from the actual environment. Any estimates of emissions from explosives use must be regarded as approximations that cannot be made more precise because explosives are not used in a precise, reproducible manner.

To a certain extent, emissions can be altered by changing the composition of the explosive mixture. This has been practiced for many years to safeguard miners who must use explosives. The U. S. Bureau of Mines has a continuing program to study the products from explosives and to identify explosives that can be used safely underground. Lead emissions from small arms use can be controlled by using jacketed soft-point projectiles and special leadfree primers.

Emission factors are given in Table 13.3-1. Factors are expressed in units of kilograms per megagram (kg/Mg) and pounds per ton (lb/ton).

References For Section 13.3

1. C. R. Newhouser, *Introduction To Explosives*, National Bomb Data Center, International Association Of Chiefs Of Police, Gaithersburg, MD (undated).

2. Roy V. Carter, "Emissions From The Open Burning Or Detonation Of Explosives", Presented at the 71st Annual Meeting of the Air Pollution Control AssociatIon, Houston, TX, June 1978.

3. Melvin A. Cook, *The Science Of High Explosives*, Reinhold Publishing Corporation, New York, 1958.

4. R. F. Chaiken, et. al., *Toxic Fumes From Explosives: Ammonium Nitrate Fuel Oil Mixtures*, Bureau Of Mines Report Of Investigations 7867, U. S. Department Of Interior, Washington, DC, 1974.

5. Sheridan J. Rogers, *Analysis Of Noncoal Mine Atmospheres: Toxic Fumes From Explosives*, Bureau Of Mines, U. S. Department Of Interior, Washington, DC, May 1976.

6. A. A. Juhasz, "A Reduction Of Airborne Lead In Indoor Firing Ranges By Using Modified Ammunition", Special Publication 480-26, Bureau Of Standards, U. S. Department Of Commerce, Washington, DC, November 1977.

Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

Source [b]	Total Particulate Matter [r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Primary Crushing (controlled) (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Secondary Crushing (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Secondary Crushing (controlled) (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Tertiary Crushing (SCC 3-050030-03)	0.0054[d]	E	0.0024[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0012[d]	E	0.00054[p]	C	0.00010[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0390[e]	E	0.0150[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0030[f]	E	0.0012[f]	E	0.000070[q]	E
Screening (SCC 3-05-020-02, 03)	0.025[c]	E	0.0087[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0022[d]	E	0.00074[m]	C	0.000050[q]	E
Fines Screening (SCC 3-05-020-21)	0.30[g]	E	0.072[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0036[g]	E	0.0022[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0030[h]	E	0.00110[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014[i]	E	4.6×10^{-5}[i]	D	1.3×10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0×10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6×10^{-5}[j]	E	ND	
Truck Unloading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		0.00010[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

TABLE 11.12-2 (ENGLISH UNITS)
EMISSION FACTORS FOR CONCRETE BATCHING [a]

Source (SCC)	Uncontrolled				Controlled			
	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating
Aggregate transfer [b] (3-05-011-04,-21,23)	0.0069	D	0.0033	D	ND		ND	
Sand transfer [b] (3-05-011-05,22,24)	0.0021	D	0.00099	D	ND		ND	
Cement unloading to elevated storage silo (pneumatic)[c] (3-05-011-07)	0.72	E	0.46	E	0.00099	D	0.00034	D
Cement supplement unloading to elevated storage silo (pneumatic)[d] (3-05-011-17)	3.14	E	1.10	E	0.0089	D	0.0049	E
Weigh hopper loading [e] (3-05-011-08)	0.0051	D	0.0024	D	ND		ND	
Mixer loading (central mix)[f] (3-05-011-09)	0.544 or Eqn. 11.12-1	B	0.134 or Eqn. 11.12-1	B	0.0173 or Eqn. 11.12-1	B	0.0048 or Eqn. 11.12-1	B
Truck loading (truck mix)[g] (3-05-011-10)	0.995	B	0.278	B	0.0568 or Eqn. 11.12-1	B	0.0160 or Eqn. 11.12-1	B
Vehicle traffic (paved roads)	See AP-42 Section 13.2.1							
Vehicle traffic (unpaved roads)	See AP-42 Section 13.2.2							
Wind erosion from aggregate and sand storage piles	See AP-42 Section 13.2.5							

The particulate matter emissions from truck mix and central mix loading operations are calculated in accordance with the values in Tables 11.12-1 or 11.12-2 or by Equation 11.12-1[14] when site specific data are available.

$$E = k\,(0.0032)\left[\frac{U^{a}}{M^{b}}\right] + c \qquad \text{Equation 11.12-1}$$

E	=	Emission factor in lbs./ton of cement and cement supplement
k	=	Particle size multiplier (dimensionless)
U	=	Wind speed, miles per hour (mph)
M	=	Minimum moisture (% by weight) of cement and cement supplement
a, b	=	Exponents
c	=	Constant

The parameters for Equation 11.12-1 are summarized in Tables 11.12-3 and 11.12-4.

Table 11.12-3. Equation Parameters for Truck Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.8	1.75	0.3	0.013
	PM_{10}	0.32	1.75	0.3	0.0052
	$PM_{10-2.5}$	0.288	1.75	0.3	0.00468
	$PM_{2.5}$	0.048	1.75	0.3	0.00078
Uncontrolled[1]	Total PM	0.995			
	PM_{10}	0.278			
	$PM_{10-2.5}$	0.228			
	$PM_{2.5}$	0.050			

Table 11.12-4. Equation Parameters for Central Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.19	0.95	0.9	0.0010
	PM_{10}	0.13	0.45	0.9	0.0010
	$PM_{10-2.5}$	0.12	0.45	0.9	0.0009
	$PM_{2.5}$	0.03	0.45	0.9	0.0002
Uncontrolled[1]	Total PM	5.90	0.6	1.3	0.120
	PM_{10}	1.92	0.4	1.3	0.040
	$PM_{10-2.5}$	1.71	0.4	1.3	0.036
	$PM_{2.5}$	0.38	0.4	1.3	0

1. Emission factors expressed in lbs/tons of cement and cement supplement

To convert from units of lbs/ton to units of kilograms per mega gram, the emissions calculated by Equation 11.12-1 should be divided by 2.0.

Particulate emission factors per yard of concrete for an average batch formulation at a typical facility are given in Tables 11.12-4 and 11.12-5. For truck mix loading and central mix loading, the

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a (W/3)^b \qquad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\,(s/12)^a (S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range

The quantity of particulate emissions generated by either type of drop operation, per kilogram (kg) (ton) of material transferred, may be estimated, with a rating of A, using the following empirical expression:[11]

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/megagram [Mg])}$$

(1)

$$E = k(0.0032) \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (pound [lb]/ton)}$$

where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1				
< 30 µm	< 15 µm	< 10 µm	< 5 µm	< 2.5 µm
0.74	0.48	0.35	0.20	0.053[a]

[a] Multiplier for < 2.5 µm taken from Reference 14.

The equation retains the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equation, as follows. Note that silt content is included, even though silt content does not appear as a correction parameter in the equation. While it is reasonable to expect that silt content and emission factors are interrelated, no significant correlation between the 2 was found during the derivation of the equation, probably because most tests with high silt contents were conducted under lower winds, and vice versa. It is recommended that estimates from the equation be reduced 1 quality rating level if the silt content used in a particular application falls outside the range given:

Ranges Of Source Conditions For Equation 1			
Silt Content (%)	Moisture Content (%)	Wind Speed	
		m/s	mph
0.44 - 19	0.25 - 4.8	0.6 - 6.7	1.3 - 15

To retain the quality rating of the equation when it is applied to a specific facility, reliable correction parameters must be determined for specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site-specific values for

13.2.5 Industrial Wind Erosion

13.2.5.1 General[1-3]

Dust emissions may be generated by wind erosion of open aggregate storage piles and exposed areas within an industrial facility. These sources typically are characterized by nonhomogeneous surfaces impregnated with nonerodible elements (particles larger than approximately 1 centimeter [cm] in diameter). Field testing of coal piles and other exposed materials using a portable wind tunnel has shown that (a) threshold wind speeds exceed 5 meters per second (m/s) (11 miles per hour [mph]) at 15 cm above the surface or 10 m/s (22 mph) at 7 m above the surface, and (b) particulate emission rates tend to decay rapidly (half-life of a few minutes) during an erosion event. In other words, these aggregate material surfaces are characterized by finite availability of erodible material (mass/area) referred to as the erosion potential. Any natural crusting of the surface binds the erodible material, thereby reducing the erosion potential.

13.2.5.2 Emissions And Correction Parameters

If typical values for threshold wind speed at 15 cm are corrected to typical wind sensor height (7 - 10 m), the resulting values exceed the upper extremes of hourly mean wind speeds observed in most areas of the country. In other words, mean atmospheric wind speeds are not sufficient to sustain wind erosion from flat surfaces of the type tested. However, wind gusts may quickly deplete a substantial portion of the erosion potential. Because erosion potential has been found to increase rapidly with increasing wind speed, estimated emissions should be related to the gusts of highest magnitude.

The routinely measured meteorological variable that best reflects the magnitude of wind gusts is the fastest mile. This quantity represents the wind speed corresponding to the whole mile of wind movement that has passed by the 1 mile contact anemometer in the least amount of time. Daily measurements of the fastest mile are presented in the monthly Local Climatological Data (LCD) summaries. The duration of the fastest mile, typically about 2 minutes (for a fastest mile of 30 mph), matches well with the half-life of the erosion process, which ranges between 1 and 4 minutes. It should be noted, however, that peak winds can significantly exceed the daily fastest mile.

The wind speed profile in the surface boundary layer is found to follow a logarithmic distribution:

$$u(z) = \frac{u*}{0.4} \ln \frac{z}{z_o} \qquad (z > z_o) \tag{1}$$

where:

u = wind speed, cm/s
u^* = friction velocity, cm/s
z = height above test surface, cm
z_o = roughness height, cm
0.4 = von Karman's constant, dimensionless

JANUARY 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35 ° 02'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	26	8*	17*	-17	1	13	48	0		0		0.0	0.00	24.83	30.31	5.2	33	7.3	22	02	18	01	01
02	34	10	22	-12	2	16	43	0	HZ	0		0.0	0.00	24.86	30.36	2.8	36	3.5	14	34	12	35	02
03	41	20	31	-3	9	22	34	0		0		0.0	0.00	24.73	30.14	1.4	02	3.0	12	33	10	33	03
04	44	19	32	-3	17	25	33	0	RA SN FG	0		T	T	24.79	30.18	5.9	34	6.9	37*	32	29*	33	04
05	43	23	33	-2	16	26	32	0		0		0.0	0.00	24.89	30.30	8.6	35	8.9	24	35	20	01	05
06	44	23	34	-1	15	27	31	0		0		0.0	0.00	24.88	30.29	7.1	36	7.9	18	34	15	02	06
07	49	27	38	3	17	29	27	0		0		0.0	0.00	24.69	30.04	5.3	36	5.9	16	01	14	01	07
08	48	23	36	1	20	29	29	0		0		0.0	0.00	24.50	29.81	2.5	36	4.9	16	02	13	02	08
09	52	24	38	3	19	30	27	0		0		0.0	0.00	24.49	29.77	1.5	23	4.9	24	34	18	36	09
10	37	21	29	-6	11	23	36	0		0		0.0	0.00	24.74	30.07	9.5	36	12.4	28	35	23	36	10
11	37	14	26	-9	-2	18	39	0		0		0.0	0.00	24.99	30.46	3.0	35	4.4	15	34	13	35	11
12	44	24	34	-1	4	23	31	0		0		0.0	0.00	24.99	30.41	1.5	34	2.8	10	33	8	34	12
13	50	22	36	1	15	29	29	0		0		0.0	0.00	24.94	30.34	5.7	35	6.3	22	31	17	31	13
14	50	28	39	4	23	32	26	0		0		0.0	0.00	24.88	30.21	6.9	35	7.9	32	34	25	33	14
15	51	24	38	3	22	32	27	0		0		0.0	0.00	24.86	30.22	2.3	36	5.0	21	33	16	33	15
16	54	27	41	6	22	34	24	0		0		0.0	0.00	24.75	30.07	5.8	36	6.4	31	02	25	02	16
17	63*	34	49*	14	27	39	16	0		0		0.0	0.00	24.65	29.90	7.0	35	8.4	35	32	28	31	17
18	58	36	47	11	20	36	18	0		0		0.0	0.00	24.72	29.96	6.7	35	8.2	25	34	20	34	18
19	59	31	45	9	16	33	20	0		0		0.0	0.00	24.57		3.8	31	9.3			21	30	19
20	48	33	41	5	13	29	24	0		0		0.0	0.00	24.82		4.5	01	8.3			21	34	20
21	51	29	40	4	12	29	25	0		0		0.0	0.00	24.76	30.09	9.0	34	9.9	33	35	24	01	21
22	53	23	38	2	15	30	27	0		0		0.0	0.00	24.63	29.94	3.6	34	5.1	20	36	15	01	22
23	48	32	40	4	16	31	25	0		0		0.0	0.00	24.75	30.05	5.3	36	7.3	23	35	18	35	23
24	44	24	34	-3	14	27	31	0	SN	0		T	T	24.75	30.08	5.0	07	7.5	26	07	22	08	24
25	45	22	34	-3	12	26	31	0		0		0.0	0.00	24.78	30.17	0.3	13	2.6	13	34	10	33	25
26	48	26	37	0	9	27	28	0		0		0.0	0.00	24.86	30.22	4.1	35	5.4	15	31	12	01	26
27	52	22	37	0	13	28	28	0		0		0.0	0.00	24.89	30.27	1.2	01	2.8	13	36	10	36	27
28	54	27	41	4	16	31	24	0		0		0.0	0.00	24.79	30.13	0.7	04	3.2	10	21	8	20	28
29	59	26	43	5	16	32	22	0		0		0.0	0.00	24.70	29.99	1.4	34	4.7	22	32	17	32	29
30	57	27	42	4	13	31	23	0		0		0.0	0.00	24.68	29.97	2.4	21	4.7	18	28	15	30	30
31	49	28	39	1	24	33	26	0	TS RA SN BR	T		T	0.07	24.55	29.80	2.6	33	7.5	31	28	25	28	31
	48.1	24.4	36.3	¤	14.4	28.1	28.5	0.0	< MONTHLY AVERAGES | TOTALS >			T	0.07	24.75	30.07	3.8	35	6.2	< MONTHLY AVERAGES				
	0.5	0.6	0.6		<——— DEPARTURE FROM NORMAL ———>								-0.42	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	884	-30	2356	-347
COOLING :	0	0	0	0

GREATEST 24-HR PRECIPITATION : 0.07 DATE : 31
GREATEST 24-HR SNOWFALL : T DATE : 31+
GREATEST SNOW DEPTH : T DATE : 31

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.56	11	0856
MIMIMUM :	29.68	31	1356

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	0	MINIMUM TEMP <= 32 :	28	PRECIPITATION >= 0.01 INCH:	1
MAXIMUM TEMP <= 32 :	1	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	0
THUNDERSTORMS :	1	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

JANUARY 2011 ALBUQUERQUE, NM

FEBRUARY 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35 ° 02'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	28	4	16	-22	6	12	49	0	SN FZFG BR HZ BLSN	1		0.8	0.04	24.63	30.06	25.6	09	25.9	44	10	37	10	01
02	9	1	5*	-34	-9	1	60	0	BLSN	0		0.0	0.00	24.89	30.50	20.4	10	20.9	43	11	35	10	02
03	18	-7*	6	-33	-4	4	59	0		0		0.0	0.00	24.89	30.53	0.5	16	5.1	16	01	12	17	03
04	34	7	21	-18	7	18	44	0		0		0.0	0.00	24.78	30.28	2.1	19	3.3	14	17	13	17	04
05	48	19	34	-5	18	27	31	0		0		0.0	0.00	24.60	29.96	4.3	31	6.4	32	31	26	30	05
06	44	23	34	-5	8	26	31	0		0		0.0	0.00	24.76	30.08	10.6	32	11.9	43	33	29	31	06
07	46	18	32	-8	15	26	33	0		0		0.0	0.00	24.74	30.14	4.6	17	5.5	23	18	16	18	07
08	52	18	35	-5	17	28	30	0		0		0.0	0.00	24.51	29.79	3.7	29	12.6	40	25	31	25	08
09	34	11	23	-17	2	16	42	0		0		0.0	0.00	24.82	30.27	4.7	35	5.2	18	35	15	36	09
10	41	12	27	-13	1	20	38	0		0		0.0	0.00	24.79	30.22	4.6	34	6.5	22	01	16	34	10
11	51	24	38	-3	8	26	27	0		0		0.0	0.00	24.92	30.31	6.7	36	7.1	18	33	15	32	11
12	55	19	37	-4	11	29	28	0		0		0.0	0.00	25.01	30.41	1.8	36	3.0	20	34	15	34	12
13	62	26	44	3	11	32	21	0		0		0.0	0.00	24.89	30.23	0.7	36	3.8	13	36	10	36	13
14	63	37	50	9	13	35	15	0		0		0.0	0.00	24.85	30.13	1.5	08	6.5	18	23	16	24	14
15	64	33	49	7	9	34	16	0		0		0.0	0.00	24.80	30.06	0.8	11	2.7	12	01	9	16	15
16	70	33	52	10	14	37	13	0		0		0.0	0.00	24.63	29.86	1.4	26	4.6	20	18	15	19	16
17	64	36	50	8	21	39	15	0		0		0.0	0.00	24.65	29.84	4.9	28	8.1	35	29	29	28	17
18	66	32	49	7	18	38	16	0		0		0.0	0.00	24.76	30.01	3.4	21	7.1	29	21	23	18	18
19	70*	45	58*	16	24	41	7	0	RA DU BLDU	0		0.0	T	24.62	29.83	8.5	19	11.2	77*	23	48*	23	19
20	51	37	44	1	24	36	21	0	RA	0		0.0	T	24.54	29.75	9.2	30	10.9	32	29	26	29	20
21	50	29	40	-3	12	29	25	0		0		0.0	0.00	24.63	29.93	1.8	29	4.2	18	22	15	22	21
22	57	27	42	-1	8	30	23	0		0		0.0	0.00	24.64	29.92	1.0	34	2.9	20	22	14	22	22
23	58	30	44	1	11	33	21	0		0		0.0	0.00	24.60	29.85	3.3	24	6.4	37	31	25	31	23
24	52	33	43	-1	15	33	22	0		0		0.0	0.00	24.65	29.90	8.2	27	9.6	32	28	26	29	24
25	61	30	46	2	12	33	19	0		0		0.0	0.00	24.62	29.88	5.2	22	7.7	33	25	25	26	25
26	64	37	51	7	-3	33	14	0		0		0.0	0.00	24.47	29.68	8.7	19	10.3	35	22	28	19	26
27	48	26	37	-7	7	29	28	0	RA VCBLDU	0		0.0	T	24.48	29.68	8.4	25	12.7	41	28	33	28	27
28	55	22	39	-5	9	28	26	0		0		0.0	0.00	24.90	30.27	2.3	14	3.3	13	17	9	18	28
	50.5	23.6	37.1	¤	10.2	27.6	27.6	0.0	<MONTHLY AVERAGES | TOTALS>			0.8	0.04	24.71	30.05	0.4	25	8.1	<MONTHLY AVERAGES				
	-4.1	-4.6	-4.3		<DEPARTURE FROM NORMAL>								-0.40	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	774	104	3130	-243
COOLING :	0	0	0	0

GREATEST 24-HR PRECIPITATION : 0.04 DATE : 01
GREATEST 24-HR SNOWFALL : 0.8 DATE : 01
GREATEST SNOW DEPTH : 1 DATE : 01

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.64	03	0758
MIMIMUM :	29.45	27	0556

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	0	MINIMUM TEMP <= 32 :	20	PRECIPITATION >= 0.01 INCH:	1
MAXIMUM TEMP <= 32 :	3	MINIMUM TEMP <= 0 :	1	PRECIPITATION >= 0.10 INCH:	0
THUNDERSTORMS :	0	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

FEBRUARY 2011
ALBUQUERQUE, NM

MARCH 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35 ° 02'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	62	27	45	0	4	31	20	0		0		0.0	0.00	24.84	30.17	0.7	09	4.0	13	03	12	03	01
02	71	34	53	8	9	37	12	0		0		0.0	0.00	24.79	30.04	3.5	30	5.2	28	26	23	27	02
03	70	39	55	10	17	39	10	0		0		0.0	0.00	24.70	29.91	4.7	27	7.3	31	24	24	24	03
04	57	36	47	2	18	36	18	0		0		0.0	0.00	24.80	30.02	12.3	32	14.1	44	30	33	31	04
05	54	26*	40*	-6	16	32	25	0		0		0.0	0.00	24.91	30.26	2.8	12	6.1	18	07	16	08	05
06	61	33	47	1	13	35	18	0		0		0.0	0.00	24.61	29.87	5.9	19	7.2	28	19	15	20	06
07	62	42	52	6	20	38	13	0	RA BLDU VCBLDU	0		0.0	T	24.40	29.55	7.8	23	10.2	59*	21	40	23	07
08	53	35	44	-2	20	35	21	0	RA	0		0.0	T	24.63	29.85	9.4	31	12.6	31	31	25	30	08
09	62	33	48	2	10	34	17	0		0		0.0	0.00	24.95	30.26	10.7	34	11.2	29	31	22	33	09
10	65	33	49	2	15	35	16	0		0		0.0	0.00	24.93	30.23	0.4	02	3.0	13	32	9	30	10
11	75	39	57	10	5	37	8	0		0		0.0	0.00	24.74	29.97	0.5	21	4.6	28	26	21	25	11
12	73	43	58	11	6	38	7	0		0		0.0	0.00	24.71	29.90	3.7	24	6.9	30	24	24	24	12
13	67	45	56	9	11	39	9	0		0		0.0	0.00	24.82	30.02	8.8	33	10.9	37	34	26	31	13
14	68	38	53	5	13	37	12	0		0		0.0	0.00	24.83	30.08	1.0	02	5.3	20	36	16	36	14
15	67	38	53	5	16	39	12	0		0		0.0	0.00	24.78	30.00	1.8	07	3.4	12	06	10	06	15
16	78*	41	60	12	17	41	5	0		0		0.0	0.00	24.73	29.92	3.5	28	8.0	31	25	26	25	16
17	76	50	63	15	19	44	2	0		0		0.0	0.00	24.76	29.91	6.5	25	9.1	28	28	23	25	17
18	74	46	60	11	17	42	5	0		0		0.0	0.00	24.80	29.98	5.0	15	7.4	33	08	29	09	18
19	75	51	63	14	14	43	2	0		0		0.0	0.00	24.68	29.84	2.8	21	11.6	35	08	29	09	19
20	73	37	55	6	-3	37	10	0		0		0.0	0.00	24.70	29.89	6.2	18	7.9	32	18	25	17	20
21	74	44	59	10	3	39	6	0	VCBLDU	0		0.0	0.00	24.55	29.71	16.0	20	17.9	51	18	40*	22	21
22	58	40	49	0	16	36	16	0	RA	0		0.0	T	24.63	29.81	13.3	28	15.3	43	28	37	28	22
23	62	30	46	-4	7	33	19	0		0		0.0	0.00	24.69	29.96	1.3	07	2.4	13	04	9	04	23
24	67	37	52	2	8	36	13	0		0		0.0	0.00	24.58	29.78	6.6	28	9.6	46	29	33	28	24
25	70	35	53	3	11	36	12	0		0		0.0	0.00	24.55	29.75	5.5	25	9.1	35	27	28	28	25
26	64	38	51	1	21	39	14	0		0		0.0	0.00	24.54	29.72	4.4	26	7.9	28	18	22	27	26
27	69	47	58	7	16	40	7	0		0		0.0	0.00	24.55	29.72	6.7	25	9.3	26	26	21	27	27
28	72	41	57	6	15	40	8	0		0		0.0	0.00	24.57	29.73	7.9	25	9.5	32	25	25	25	28
29	66	45	56	5	0	37	9	0		0		0.0	0.00	24.70	29.89	8.4	34	9.9	28	30	22	29	29
30	67	39	53	2	9	38	12	0		0		0.0	0.00	24.68	29.88	11.7	33	12.6	36	34	29	33	30
31	76	49	63*	11	23	44	2	0		0		0.0	0.00	24.68	29.86	12.2	32	13.4	32	33	26	31	31
	67.4	39.1	53.3	¤	12.5	37.6	11.6	0.0	< MONTHLY AVERAGES | TOTALS >			0.0	T	24.70	29.92	3.5	28	8.8	< MONTHLY AVERAGES				
	5.0	5.4	5.2		<—— DEPARTURE FROM NORMAL ——>								-0.61	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	360	-165	3490	-408
COOLING :	0	0	0	0

GREATEST 24-HR PRECIPITATION : T DATE : 22+
GREATEST 24-HR SNOWFALL : 0.0 DATE :
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.45	05	0826
MIMIMUM :	29.37	07	1556

NUMBER OF DAYS WITH ->			
MAXIMUM TEMP >= 90 : 0	MINIMUM TEMP <= 32 : 3	PRECIPITATION >= 0.01 INCH: 0
MAXIMUM TEMP <= 32 : 0	MINIMUM TEMP <= 0 : 0	PRECIPITATION >= 0.10 INCH: 0
THUNDERSTORMS : 0	HEAVY FOG : 0	SNOWFALL >= 1.0 INCH : 0

MARCH 2011 ALBUQUERQUE, NM

APRIL 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35 ° 02'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	81	45	63	11	12	43	2	0		0		0.0	0.00	24.70	29.84	4.1	34	6.7	35	36	23	35	01
02	83	47	65	13	13	43	0	0		0		0.0	0.00	24.63	29.76	3.9	26	6.9	26	28	21	29	02
03	76	44	60	7	21	44	5	0	HZ BLDU VCBLDU	0		0.0	0.00	24.53	29.62	12.5	27	19.6	60*	28	44	27	03
04	60	34	47	-6	0	31	18	0		0		0.0	0.00	24.84	30.11	10.6	34	12.6	38	31	28	31	04
05	75	41	58	5	5	38	7	0		0		0.0	0.00	24.70	29.91	1.8	24	6.6	21	20	17	19	05
06	74	56	65	12	19	44	0	0		0		0.0	0.00	24.63	29.78	9.6	28	11.7	38	28	30	28	06
07	71	50	61	8	28	45	4	0	TSRA RA	0		0.0	0.03	24.52	29.67	7.4	24	9.1	44	24	28	27	07
08	73	46	60	7	19	42	5	0		0		0.0	0.00	24.49	29.62	14.6	18	15.8	43	17	35	17	08
09	69	41	55	1	24	42	10	0	DU BLDU	0		0.0	0.00	24.50	29.63	14.9	22	20.4	52	19	40	22	09
10	55	33	44*	-10	10	32	21	0		0		0.0	0.00	24.73	29.99	12.4	30	13.8	38	28	29	30	10
11	66	31*	49	-5	6	35	16	0		0		0.0	0.00	24.87	30.15	0.6	33	5.5	24	34	17	34	11
12	73	44	59	4	7	39	6	0		0		0.0	0.00	24.69	29.89	1.2	18	4.9	17	22	13	19	12
13	74	41	58	3	9	39	7	0		0		0.0	0.00	24.64	29.81	6.4	24	9.3	26	27	22	26	13
14	63	46	55	0	5	36	10	0	VCBLDU	0		0.0	0.00	24.66	29.84	17.8	30	19.1	48	29	39	29	14
15	68	43	56	1	-5	36	9	0		0		0.0	0.00	24.78	30.00	14.5	33	15.6	38	33	31	32	15
16	75	37	56	0	4	39	9	0		0		0.0	0.00	24.68	29.88	1.0	34	4.7	20	27	15	31	16
17	82	44	63	7	17	44	2	0		0		0.0	0.00	24.58	29.70	8.5	27	10.4	41	28	30	27	17
18	83	53	68	12	18	46	0	3		0		0.0	0.00	24.51	29.60	12.7	26	15.6	41	28	31	27	18
19	78	57	68	12	25	47	0	3		0		0.0	0.00	24.59	29.68	7.2	28	10.6	36	29	25	28	19
20	79	51	65	8	18	45	0	0		0		0.0	0.00	24.67	29.81	6.5	18	8.1	35	18	26	18	20
21	80	58	69*	12	17	46	0	4		0		0.0	0.00	24.62	29.72	13.2	26	14.2	41	27	31	27	21
22	78	55	67	10	18	45	0	2		0		0.0	0.00	24.57	29.68	9.9	26	11.4	37	28	29	27	22
23	70	51	61	4	22	44	4	0	RA BLDU	0		0.0	T	24.58	29.70	5.0	20	8.2	52	19	31	18	23
24	72	53	63	6	24	44	2	0	RA	0		0.0	T	24.55	29.67	9.6	27	12.5	47	25	35	25	24
25	70	45	58	0	25	43	7	0		0		0.0	0.00	24.52	29.67	10.4	30	13.1	37	34	29	29	25
26	65	44	55	-4	22	40	10	0	VCBLDU	0		0.0	0.00	24.44	29.57	19.1	31	20.8	54	31	44*	31	26
27	62	37	50	-9	6	34	15	0		0		0.0	0.00	24.75	29.99	14.4	34	14.9	43	32	33	31	27
28	73	35	54	-5	7	38	11	0		0		0.0	0.00	24.76	30.01	0.8	18	5.8	22	17	17	17	28
29	83*	48	66	7	7	43	0	1	VCBLDU	0		0.0	0.00	24.50	29.60	12.6	25	15.8	49	28	38	27	29
30	66	43	55	-5	4	35	10	0		0		0.0	0.00	24.59	29.75	11.5	34	13.2	37	32	25	34	30
	72.6	45.1	58.9	¤	13.6	40.7	6.3	0.4	<MONTHLY AVERAGES | TOTALS>			0.0	0.03	24.63	29.79	6.6	28	11.9	<MONTHLY AVERAGES				
	2.0	4.6	3.3		<—— DEPARTURE FROM NORMAL ——>								-0.47	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	190	-104	3680	-512
COOLING :	13	7	13	7

GREATEST 24-HR PRECIPITATION : 0.03 DATE : 07
GREATEST 24-HR SNOWFALL : 0.0 DATE :
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.28	11	0856
MIMIMUM :	29.43	29	1456

NUMBER OF -> DAYS WITH			
MAXIMUM TEMP >= 90 : 0	MINIMUM TEMP <= 32 : 1	PRECIPITATION >= 0.01 INCH: 1
MAXIMUM TEMP <= 32 : 0	MINIMUM TEMP <= 0 : 0	PRECIPITATION >= 0.10 INCH: 0
THUNDERSTORMS : 1	HEAVY FOG : 0	SNOWFALL >= 1.0 INCH : 0

APRIL 2011 ALBUQUERQUE, NM

MAY 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35 ° 02'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	50	37	44*	-16	24	35	21	0	RA SN BR BLDU	0		T	T	24.73	29.99	17.2	10	19.1	47	11	38	11	01
02	57	32*	45	-15	19	35	20	0		0		0.0	0.00	24.96	30.29	1.8	33	4.3	20	09	16	33	02
03	68	35	52	-8	9	36	13	0		0		0.0	0.00	24.93	30.22	2.3	20	5.1	18	18	14	18	03
04	82	44	63	2	7	41	2	0		0		0.0	0.00	24.81	30.01	2.0	25	7.8	39	23	28	24	04
05	78	50	64	3	15	43	1	0		0		0.0	0.00	24.83	30.00	1.6	05	5.4	21	09	17	09	05
06	85	51	68	7	12	45	0	3		0		0.0	0.00	24.67	29.80	4.1	27	8.1	36	25	26	24	06
07	87	52	70	8	6	44	0	5		0		0.0	0.00	24.63	29.73	2.8	21	6.2	29	29	22	24	07
08	85	51	68	6	1	43	0	3		0		0.0	0.00	24.54	29.63	6.9	22	8.5	33	22	25	26	08
09	82	50	66	4	9	43	0	1	BLDU VCBLDU	0		0.0	0.00	24.44	29.52	13.5	21	17.0	52*	19	38	22	09
10	77	48	63	0	22	44	2	0	RA	0		0.0	T	24.46	29.55	6.3	24	11.8	48	18	33	19	10
11	65	38	52	-11	28	41	13	0	RA	0		0.0	T	24.62	29.79	9.1	27	11.0	38	31	30	31	11
12	74	42	58	-5	26	45	7	0		0		0.0	0.00	24.76	29.95	11.0	31	12.0	33	30	26	30	12
13	79	46	63	0	24	46	2	0		0		0.0	0.00	24.79	29.96	3.1	12	8.4	35	12	26	12	13
14	82	55	69	5	22	46	0	4		0		0.0	0.00	24.66	29.79	14.2	12	17.8	41	09	32	09	14
15	79	51	65	1	25	47	0	0	BLDU	0		0.0	0.00	24.68	29.81	14.2	10	16.1	46	09	35	09	15
16	83	53	68	3	14	45	0	3		0		0.0	0.00	24.61	29.72	6.3	17	9.7	37	17	29	17	16
17	73	50	62	-3	16	43	3	0		0		0.0	0.00	24.52		9.0	26	10.2	36	26	23	25	17
18	75	49	62	-3	29	45	3	0	RA VCBLDU	0		0.0	0.03	24.42	29.51	8.1	26	13.6	40	27	31	27	18
19	62	43	53	-12	32	42	12	0	RA	0		0.0	0.02	24.54	29.71	3.7	31	9.7	28	28	23	28	19
20	67	39	53	-13	29	43	12	0	RA	0		0.0	T	24.64	29.84	7.2	29	10.1	39	29	28	29	20
21	76	43	60	-6	29	46	5	0		0		0.0	0.00	24.67	29.84	6.9	32	8.6	32	33	25	31	21
22	81	48	65	-2	27	47	0	0		0		0.0	0.00	24.63	29.75	1.9	27	7.3	32	22	25	22	22
23	82	51	67	0	19	46	0	2		0		0.0	0.00	24.58	29.69	6.8	19	9.0	35	19	23	17	23
24	74	56	65	-3	20	44	0	0		0		0.0	0.00	24.59	29.69	15.3	28	17.2	49	28	40*	29	24
25	81	49	65	-3	19	45	0	0		0		0.0	0.00	24.75	29.90	6.5	32	8.1	30	31	24	34	25
26	89	55	72	4	19	47	0	7		0		0.0	0.00	24.65	29.77	7.3	27	10.6	36	28	29	28	26
27	93	61	77	9	19	50	0	12		0		0.0	0.00	24.58	29.64	11.2	27	11.9	36	26	29	27	27
28	93*	65	79*	10	23	51	0	14		0		0.0	0.00	24.48	29.50	11.0	24	13.0	37	27	28	26	28
29	90	61	76	7	18	49	0	11		0		0.0	0.00	24.42	29.42	16.1	20	17.1	48	21	36	22	29
30	78	60	69	0	17	47	0	4		0		0.0	0.00	24.63	29.69	11.5	27	15.9	43	32	33	29	30
31	87	50	69	-1	8	44	0	4		0		0.0	0.00	24.88	30.04	2.3	21	8.9	31	21	22	21	31
	77.9	48.9	63.4	¤	18.9	44.1	3.7	2.4	<MONTHLY AVERAGES | TOTALS>			T	0.05	24.60	29.72	3.5	24	11.0	<MONTHLY AVERAGES				
	-1.8	-0.8	-1.3		<—— DEPARTURE FROM NORMAL ——>								-0.55	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	116	31	3796	-481
COOLING :	73	3	86	10

GREATEST 24-HR PRECIPITATION : 0.05 DATE : 18-19
GREATEST 24-HR SNOWFALL : T DATE : 01
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.36	02	0856
MIMIMUM :	29.33	18	1456

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	3	MINIMUM TEMP <= 32 :	1	PRECIPITATION >= 0.01 INCH:	2
MAXIMUM TEMP <= 32 :	0	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	0
THUNDERSTORMS :	0	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

MAY 2011 ALBUQUERQUE, NM

JUNE 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35 ° 02'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	94	62	78	7	35	56	0	13		0		0.0	0.00	24.77	29.86	9.9	19	12.6	40	19	33	17	01
02	93	67	80	9	25	53	0	15	FU	0		0.0	0.00	24.67	29.72	10.8	20	12.5	37	18	29	18	02
03	92	59	76	5	20	50	0	11	FU	0		0.0	0.00	24.70	29.77	7.7	19	10.2	43	19	30	17	03
04	93	62	78	7	28	53	0	13	FU	0		0.0	0.00	24.83	29.91	6.4	14	9.4	36	13	31	12	04
05	91	64	78	6	37	55	0	13	FU BLDU	0		0.0	0.00	24.86	29.97	2.0	15	11.0	41	27	35	09	05
06	93	66	80	7	33	54	0	15	FU	0		0.0	0.00	24.71	29.80	7.7	21	9.7	40	27	31	27	06
07	92	58	75	2	14	48	0	10	HZ FU	0		0.0	0.00	24.67	29.73	1.6	27	5.6	24	29	22	29	07
08	94	57	76	3	5	47	0	11	FU	0		0.0	0.00	24.65	29.72	4.7	20	6.7	37	22	26	22	08
09	88	55*	72	-2	5	46	0	7	FU	0		0.0	0.00	24.70	29.78	3.4	26	6.3	25	26	20	25	09
10	89	59	74	0	6	46	0	9		0		0.0	0.00	24.68	29.76	0.5	19	6.6	23	24	18	24	10
11	90	59	75	1	9	48	0	10	FU	0		0.0	0.00	24.66	29.73	3.7	20	6.0	26	22	21	24	11
12	93	60	77	3	9	48	0	12	FU	0		0.0	0.00	24.68	29.74	7.4	18	8.6	38	14	29	18	12
13	94	61	78	3	6	48	0	13	FU	0		0.0	0.00	24.72	29.79	3.7	22	6.5	33	22	25	22	13
14	91	57	74	-1	10	48	0	9		0		0.0	0.00	24.75	29.83	6.0	33	10.1	31	30	26	27	14
15	93	61	77	2	21	51	0	12		0		0.0	0.00	24.67	29.73	0.6	19	5.1	18	17	14	17	15
16	95	71	83	8	16	52	0	18	FU	0		0.0	0.00	24.57	29.58	8.8	25	11.1	37	27	25	25	16
17	94	62	78	2	13	50	0	13		0		0.0	0.00	24.64	29.67	9.2	25	10.9	35	29	28	28	17
18	94	62	78	2	6	48	0	13		0		0.0	0.00	24.67	29.73	8.9	26	10.8	39	27	29	26	18
19	94	59	77	1	14	49	0	12	FU BLDU	0		0.0	0.00	24.52	29.54	10.3	26	14.8	51*	34	38*	34	19
20	83	57	70*	-6	31	50	0	5	TS RA	0		0.0	T	24.60	29.67	10.8	32	12.2	33	30	26	31	20
21	89	59	74	-2	26	51	0	9		0		0.0	0.00	24.70	29.79	6.0	33	8.0	30	30	18	32	21
22	94	62	78	2	24	52	0	13		0		0.0	0.00	24.75	29.81	2.6	11	4.6	26	08	22	08	22
23	99	64	82	5	19	52	0	17		0		0.0	0.00	24.70	29.74	3.2	19	7.5	26	18	21	27	23
24	100	65	83	6	19	53	0	18		0		0.0	0.00	24.66	29.69	3.8	26	7.6	32	30	25	28	24
25	99	69	84	7	22	54	0	19		0		0.0	0.00	24.68	29.70	5.0	27	8.1	32	29	25	27	25
26	100*	65	83	6	24	54	0	18		0		0.0	0.00	24.69	29.72	6.1	23	10.7	39	27	32	28	26
27	98	70	84	7	30	56	0	19		0		0.0	0.00	24.75	29.79	7.7	12	11.5	40	10	32	09	27
28	97	70	84*	7	40	58	0	19	FU VCBLDU	0		0.0	0.00	24.81	29.86	1.3	19	9.4	39	27	30	26	28
29	96	69	83	5	36	57	0	18		0		0.0	0.00	24.75	29.80	8.4	20	11.5	33	21	28	22	29
30	97	69	83	5	38	57	0	18	RA	0		0.0	T	24.71	29.76	9.4	18	11.8	35	18	30	18	30
	93.6	62.7	78.2	¤	20.7	51.5	0.0	13.4	<MONTHLY AVERAGES | TOTALS>			0.0	T	24.70	29.76	3.7	22	9.2	<MONTHLY AVERAGES				
	3.4	3.3	3.4		<DEPARTURE FROM NORMAL>								-0.65	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	0	-4	3796	-485
COOLING :	402	105	488	115

GREATEST 24-HR PRECIPITATION : T DATE : 30+
GREATEST 24-HR SNOWFALL : 0.0 DATE :
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.06	05	0756
MIMIMUM :	29.36	19	1656

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	26	MINIMUM TEMP <= 32 :	0	PRECIPITATION >= 0.01 INCH:	0
MAXIMUM TEMP <= 32 :	0	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	0
THUNDERSTORMS :	1	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

JUNE 2011 ALBUQUERQUE, NM

JULY 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35° 2'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	97	67	82	4	36	57	0	17		0		0.0	0.00	24.73	29.79	0.4	10	5.7	26	20	23	19	01
02	93	73	83	5	44	60	0	18	TS TSRA RA	0		0.0	T	24.81	29.86	3.7	08	8.5	43	09	37	08	02
03	94	69	82	4	46	60	0	17	RA FU	0		0.0	T	24.81	29.88	5.0	10	10.1	43	08	36	08	03
04	96	68	82	4	42	59	0	17		0		0.0	0.00	24.77	29.84	1.5	12	6.3	36	14	25	15	04
05	94	69	82	4	40	58	0	17		0		0.0	0.00	24.78	29.84	2.9	23	5.5	24	21	18	20	05
06	95	72	84	6	38	58	0	19		0		0.0	0.00	24.80	29.85	6.1	20	8.7	24	22	18	23	06
07	97	70	84	6	39	59	0	19		0		0.0	0.00	24.75	29.80	4.1	19	5.0	22	18	17	19	07
08	97	70	84	6	40	59	0	19		0		0.0	0.00	24.71	29.75	2.4	25	6.9	29	21	21	21	08
09	97	68	83	5	45	60	0	18	RA DU BLDU	0		0.0	T	24.73	29.77	3.9	28	8.0	39	28	33	28	09
10	96	68	82	4	46	61	0	17	TS TSRA RA	0		0.0	T	24.71	29.76	0.7	05	5.9	26	35	21	35	10
11	95	65	80	2	51	61	0	15	RA	0		0.0	T	24.76	29.83	2.0	14	8.5	38	29	33	29	11
12	89	61*	75*	-4	52	61	0	10		0		0.0	0.00	24.77	29.87	4.3	24	6.6	28	26	23	24	12
13	93	68	81	2	49	61	0	16	RA	0		0.0	T	24.72	29.78	4.3	17	5.8	28	13	22	13	13
14	90	69	80	1	47	60	0	15		0		0.0	0.00	24.69	29.75	5.3	18	7.5	21	20	17	19	14
15	95	67	81	2	39	58	0	16		0		0.0	0.00	24.68	29.73	4.4	16	6.3	20	18	16	18	15
16	97	74	86*	7	44	60	0	21		0		0.0	0.00	24.74	29.77	7.3	15	9.0	30	13	25	13	16
17	95	74	85	6	48	62	0	20		0		0.0	0.00	24.83	29.89	7.4	14	11.1	39	14	24	12	17
18	95	75	85	6	50	63	0	20	TS TSRA RA	0		0.0	0.03	24.84	29.92	2.2	12	6.9	38	14	29	13	18
19	97	68	83	4	45	60	0	18	BLDU VCBLDU	0		0.0	0.00	24.79	29.87	1.7	27	6.9	40	24	31	26	19
20	97	70	84	5	50	62	0	19	TS TSRA RA VCBLDU	0		0.0	0.11	24.75	29.81	1.4	05	6.3	45	09	37	08	20
21	96	69	83	4	53	63	0	18	RA SQ VCBLDU	0		0.0	T	24.71	29.78	2.4	22	6.0	45	27	40	25	21
22	94	73	84	5	53	63	0	19	TS TSRA RA	0		0.0	0.14	24.70	29.76	0.7	10	5.8	30	12	25	11	22
23	97	71	84	5	54	63	0	19	RA BLDU	0		0.0	T	24.76	29.83	6.8	09	9.2	54*	08	44*	08	23
24	96	69	83	4	53	63	0	18	TS TSRA RA	0		0.0	0.04	24.86	29.94	2.2	12	7.3	36	02	24	36	24
25	90	67	79	0	55	64	0	14	TS RA	0		0.0	0.07	24.82	29.92	4.0	12	7.9	28	15	25	08	25
26	93	68	81	3	53	63	0	16	RA FU	0		0.0	T	24.73	29.79	2.6	28	7.8	31	33	24	35	26
27	93	65	79	1	51	62	0	14		0		0.0	0.00	24.73	29.80	2.7	31	5.2	25	30	17	31	27
28	97*	67	82	4	50	61	0	17		0		0.0	0.00	24.76	29.83	5.8	08	9.6	37	08	32	08	28
29	90	73	82	4	52	62	0	17	RA	0		0.0	T	24.86	29.94	9.4	09	11.3	29	11	26	13	29
30	92	69	81	3	51	62	0	16	RA	0		0.0	T	24.88	29.99	2.4	09	7.7	43	08	36	08	30
31	91	67	79	1	55	62	0	14	TS RA	0		0.0	T	24.91	30.03	2.8	05	12.0	45	08	38	08	31
	94.5	69.1	81.8	¤	47.5	60.9	0.0	17.1	<MONTHLY AVERAGES | TOTALS>			0.0	0.39	24.77	29.84	1.8	14	7.6	<MONTHLY AVERAGES				
	2.2	4.4	3.3		<DEPARTURE FROM NORMAL>								-0.88	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	0	0	0	0
COOLING :	530	113	1018	228

GREATEST 24-HR PRECIPITATION : 0.14 DATE : 22
GREATEST 24-HR SNOWFALL : 0.0 DATE :
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.10	31	2156
MIMIMUM :	29.64	22	1705

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	30	MINIMUM TEMP <= 32 :	0	PRECIPITATION >= 0.01 INCH:	5
MAXIMUM TEMP <= 32 :	0	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	2
THUNDERSTORMS :	8	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

AUGUST 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35° 2'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	92	65	79	1	54	63	0	14	VCBLDU	0		0.0	0.00	24.88	29.99	3.7	29	6.9	33	28	29	28	01
02	93	66	80	2	52	63	0	15		0		0.0	0.00	24.80	29.88	0.5	12	6.2	35	08	30	08	02
03	94	68	81	3	55	63	0	16	TS TSRA RA	0		0.0	0.12	24.81	29.89	2.4	06	8.1	41	16	31	16	03
04	92	68	80	2	52	63	0	15		0		0.0	0.00	24.79	29.89	0.8	27	3.7	25	24	22	24	04
05	94	72	83	5	52	63	0	18	TS RA	0		0.0	T	24.79	29.87	2.0	12	6.4	39	15	31	15	05
06	96	68	82	4	48	61	0	17		0		0.0	0.00	24.78	29.86	1.7	19	4.9	18	16	14	16	06
07	99*	71	85*	8	38	58	0	20		0		0.0	0.00	24.75	29.79	2.4	32	5.1	20	27	15	28	07
08	98	68	83	6	20	53	0	18		0		0.0	0.00	24.73	29.77	4.6	34	5.9	26	29	21	31	08
09	98	69	84	7	23	53	0	19		0		0.0	0.00	24.71	29.75	1.7	30	6.1	21	36	17	35	09
10	96	67	82	5	42	59	0	17	TS TSRA RA	0		0.0	T	24.70	29.73	2.4	36	6.3	36	33	25	33	10
11	94	73	84	7	49	62	0	19	RA	0		0.0	T	24.73	29.78	2.1	26	7.2	29	22	23	21	11
12	97	70	84	7	49	62	0	19	TS	0		0.0	0.00	24.75	29.80	3.3	15	6.8	25	09	20	15	12
13	92	73	83	6	51	62	0	18	RA	0		0.0	T	24.83	29.90	3.2	09	11.6	32	08	25	09	13
14	91	68	80	3	49	61	0	15		0		0.0	0.00	24.82	29.92	2.9	19	7.4	23	18	18	18	14
15	92	69	81	5	52	62	0	16		0		0.0	0.00	24.75	29.82	6.1	19	7.6	25	21	21	24	15
16	94	68	81	5	49	62	0	16	TS	0		0.0	0.00	24.79	29.85	5.2	12	7.5	24	08	21	08	16
17	90	70	80	4	55	63	0	15	TS RA SQ VCBLDU	0		0.0	T	24.90	29.99	7.6	08	12.7	41	13	36	14	17
18	92	67	80	4	55	63	0	15	TS TSRA RA	0		0.0	T	24.83	29.94	1.1	32	4.9	26	32	22	31	18
19	90	68	79	3	54	63	0	14	RA	0		0.0	T	24.75	29.83	2.5	28	5.3	23	35	18	30	19
20	89	67	78	2	56	64	0	13	TS TSRA RA	0		0.0	T	24.78	29.86	6.1	05	11.2	36	08	30	08	20
21	87	64*	76*	1	58	64	0	11	TS TSRA RA BR	0		0.0	0.32	24.86	29.96	6.0	08	9.7	29	28	25	28	21
22	92	67	80	5	55	64	0	15		0		0.0	0.00	24.83	29.94	2.8	33	4.4	16	35	13	01	22
23	97	70	84	9	49	62	0	19		0		0.0	0.00	24.78	29.85	1.0	01	4.9	17	35	12	16	23
24	95	67	81	6	50	62	0	16	TS TSRA RA SQ	0		0.0	0.23	24.81	29.88	1.2	04	7.9	47	09	39	09	24
25	93	66	80	5	54	63	0	15	TS TSRA RA VCBLDU	0		0.0	0.15	24.87	29.97	2.9	11	7.3	47	16	38	16	25
26	93	65	79	5	49	62	0	14		0		0.0	0.00	24.88	29.97	0.9	02	4.1	24	14	22	14	26
27	95	73	84	10	48	62	0	19		0		0.0	0.00	24.85	29.93	2.6	04	6.4	29	01	23	02	27
28	96	72	84	10	50	63	0	19	TS TSRA RA	0		0.0	T	24.78	29.84	2.4	03	5.1	36	02	31	02	28
29	94	69	82	8	53	63	0	17	TS TSRA RA SQ VCBLDU	0		0.0	0.11	24.75	29.83	1.3	30	8.7	63*	29	45*	29	29
30	97	68	83	9	44	60	0	18		0		0.0	0.00	24.71	29.78	0.8	24	4.8	20	31	14	29	30
31	96	68	82	9	45	59	0	17	RA VCBLDU	0		0.0	T	24.76	29.82	2.0	24	6.6	45	27	36	27	31
	93.8	68.5	81.2	¤	48.7	61.5	0.0	16.4	<MONTHLY AVERAGES | TOTALS>			0.0	0.93	24.79	29.87	0.6	06	6.8	<MONTHLY AVERAGES				
	4.8	5.3	5.1		<—— DEPARTURE FROM NORMAL ——>								-0.80	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	0	0	0	0
COOLING :	509	166	1527	394

GREATEST 24-HR PRECIPITATION : 0.38 DATE : 24-25
GREATEST 24-HR SNOWFALL : 0.0 DATE :
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.09	17	2013
MIMIMUM :	29.66	10	1556

NUMBER OF DAYS WITH			
	MAXIMUM TEMP >= 90 : 29	MINIMUM TEMP <= 32 : 0	PRECIPITATION >= 0.01 INCH: 5
	MAXIMUM TEMP <= 32 : 0	MINIMUM TEMP <= 0 : 0	PRECIPITATION >= 0.10 INCH: 5
	THUNDERSTORMS : 13	HEAVY FOG : 0	SNOWFALL >= 1.0 INCH : 0

AUGUST 2011 ALBUQUERQUE, NM

SEPTEMBER 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35° 2'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	94*	68	81*	8	52	62	0	16	TS TSRA RA	0		0.0	0.08	24.80	29.89	0.8	34	7.3	33	21	25	14	01
02	92	63	78	5	51	62	0	13		0		0.0	0.00	24.75	29.84	1.5	31	3.6	16	01	13	02	02
03	93	66	80	7	47	60	0	15	TS TSRA RA	0		0.0	0.01	24.76	29.83	4.5	07	9.9	41	12	36	12	03
04	79	66	73	0	51	59	0	8	RA	0		0.0	T	24.89	30.02	17.2	10	17.5	43	09	33	09	04
05	82	62	72	0	47	57	0	7		0		0.0	0.00	24.87	30.02	3.9	11	7.8	24	08	21	08	05
06	85	65	75	3	53	60	0	10	TS TSRA RA	0		0.0	0.08	24.86	29.98	2.7	19	5.5	26	17	23	17	06
07	82	62	72	0	54	60	0	7	TS RA	0		0.0	0.08	24.91	30.07	6.5	09	7.9	38	09	31	08	07
08	79	59	69	-2	38	52	0	4		0		0.0	0.00	24.94	30.11	9.2	11	12.7	31	08	25	08	08
09	73	58	66	-5	47	54	0	1	RA	0		0.0	0.05	24.88	30.04	12.0	08	14.9	35	08	29	08	09
10	74	60	67	-4	47	55	0	2	RA	0		0.0	T	24.89	30.07	12.4	09	13.0	31	09	28	08	10
11	81	57	69	-2	46	56	0	4	TSRA RA	0		0.0	T	24.93	30.10	2.6	34	4.9	24	29	20	31	11
12	79	56	68	-3	48	56	0	3		0		0.0	0.00	24.95	30.13	1.5	24	5.3	22	19	18	19	12
13	82	55	69	-1	47	56	0	4	TS RA	0		0.0	0.02	24.87	30.04	2.7	27	4.9	31	19	26	19	13
14	78	58	68	-2	50	56	0	3	TS TSRA RA BR	0		0.0	0.07	24.81	29.96	0.6	09	7.4	46	19	32	11	14
15	73	57	65	-4	50	56	0	0	TSRA RA	0		0.0	0.01	24.78	29.95	1.7	18	7.0	33	18	28	18	15
16	79	51*	65*	-4	47	55	0	0		0		0.0	0.00	24.78	29.95	0.6	30	5.8	29	23	21	23	16
17	79	58	69	0	46	55	0	4	TS TSRA RA	0		0.0	T	24.81	29.97	2.0	34	6.4	33	32	25	32	17
18	81	54	68	0	41	53	0	3		0		0.0	0.00	24.90	30.07	5.5	34	6.2	29	32	21	32	18
19	83	55	69	1	40	53	0	4	TS TSRA RA	0		0.0	T	24.87	30.03	1.2	01	4.7	43	23	29	22	19
20	86	57	72	4	34	52	0	7		0		0.0	0.00	24.81	29.93	1.6	01	3.7	26	08	21	09	20
21	84	62	73	5	37	52	0	8	TS TSRA RA	0		0.0	T	24.82	29.95	3.2	07	9.3	55*	29	45*	29	21
22	81	56	69	2	35	51	0	4		0		0.0	0.00	24.89	30.05	5.2	08	8.2	37	09	30	09	22
23	86	52	69	3	28	49	0	4		0		0.0	0.00	24.91	30.07	1.6	36	3.1	13	35	12	33	23
24	87	53	70	4	20	47	0	5		0		0.0	0.00	24.80	29.94	4.3	34	6.1	23	29	18	29	24
25	87	54	71	5	21	48	0	6		0		0.0	0.00	24.73	29.84	1.6	28	4.1	24	27	18	27	25
26	88	55	72	6	30	50	0	7		0		0.0	0.00	24.75	29.86	2.1	20	4.7	18	29	15	28	26
27	85	62	74	8	35	52	0	9	TS RA	0		0.0	T	24.83	29.96	5.9	06	8.8	36	09	29	09	27
28	88	56	72	7	33	52	0	7		0		0.0	0.00	24.81	29.94	4.2	34	5.4	17	35	14	01	28
29	89	60	75	11	32	51	0	10	RA SQ VCBLDU	0		0.0	T	24.88	30.01	9.5	10	14.2	46	14	36	14	29
30	79	58	69	5	34	50	0	4		0		0.0	0.00	24.94	30.13	7.1	10	9.3	41	08	33	10	30
	82.9	58.5	70.7	¤	41.4	54.4	0.0	6.0	<MONTHLY AVERAGES | TOTALS>			0.0	0.40	24.84	29.99	2.7	08	7.7	<MONTHLY AVERAGES				
	0.7	2.5	1.6		<—— DEPARTURE FROM NORMAL ——>								-0.67	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	0	-29	0	-29
COOLING :	179	31	1706	425

GREATEST 24-HR PRECIPITATION : 0.16 DATE : 06-07
GREATEST 24-HR SNOWFALL : 0.0 DATE :
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.25	30	0911
MIMIMUM :	29.74	25	1654

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	3	MINIMUM TEMP <= 32 :	0	PRECIPITATION >= 0.01 INCH:	8
MAXIMUM TEMP <= 32 :	0	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	0
THUNDERSTORMS :	12	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

SEPTEMBER 2011
ALBUQUERQUE, NM

OCTOBER 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35° 2'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	80	57	69*	5	33	50	0	4		0		0.0	0.00	24.89	30.06	3.9	18	5.7	18	22	14	21	01
02	79	57	68	5	39	52	0	3		0		0.0	0.00	24.90	30.06	2.7	21	4.3	30	22	25	22	02
03	76	55	66	3	44	54	0	1	TS TSRA RA	0		0.0	0.04	24.86	30.05	2.3	15	6.4	32	16	26	15	03
04	65	52	59	-3	50	53	6	0	RA BR	0		0.0	0.41	24.80	29.99	2.4	36	5.7	31	26	24	26	04
05	67	51	59	-3	46	52	6	0	TS TSRA RA BR	0		0.0	0.57	24.67	29.86	3.7	17	7.2	23	20	17	17	05
06	74	48	61	-1	36	47	4	0		0		0.0	0.00	24.55	29.68	6.1	21	16.5	43	19	36	19	06
07	59	41	50	-11	41	44	15	0	RA BR	0		0.0	0.42	24.66	29.88	3.1	34	7.5	25	31	21	30	07
08	59	38	49	-12	32	41	16	0		0		0.0	0.00	24.74	29.99	2.5	33	6.8	20	30	16	30	08
09	61	45	53	-7	33	43	12	0		0		0.0	0.00	24.78	30.02	3.1	07	6.3	21	09	17	08	09
10	68	44	56	-4	33	45	9	0		0		0.0	0.00	24.74	29.97	0.5	07	4.1	17	22	10	21	10
11	76	47	62	3	31	46	3	0		0		0.0	0.00	24.68	29.86	5.0	33	8.0	30	31	24	29	11
12	75	47	61	2	29	46	4	0		0		0.0	0.00	24.79	29.97	4.6	34	5.7	16	36	13	34	12
13	76	45	61	2	28	46	4	0		0		0.0	0.00	24.78		0.2	16	1.2	15	26	10	26	13
14	80	48	64	6	26	46	1	0		0		0.0	0.00	24.78	29.95	3.2	31	4.6	30	29	22	31	14
15	81	51	66	8	31	48	0	1		0		0.0	0.00	24.83	30.01	1.9	04	4.0	15	35	12	36	15
16	83*	48	66	9	30	48	0	1		0		0.0	0.00	24.80	29.97	1.5	09	3.5	14	02	12	02	16
17	76	51	64	7	24	45	1	0		0		0.0	0.00	24.78	29.94	6.8	31	12.1	41	32	32	31	17
18	68	45	57	1	30	44	8	0		0		0.0	0.00	24.89	30.12	2.8	05	6.0	18	08	16	08	18
19	68	43	56	0	29	43	9	0		0		0.0	0.00	24.81	30.05	0.9	18	5.1	20	19	15	19	19
20	77	45	61	5	24	44	4	0		0		0.0	0.00	24.79	29.98	1.3	01	4.3	21	30	13	34	20
21	76	46	61	6	22	43	4	0		0		0.0	0.00	24.86	30.07	1.4	31	3.4	17	30	14	30	21
22	76	44	60	5	21	43	5	0		0		0.0	0.00	24.86	30.06	3.5	32	4.7	23	31	18	31	22
23	75	46	61	7	25	43	4	0		0		0.0	0.00	24.88	30.09	1.3	02	3.5	12	30	9	31	23
24	77	47	62	8	28	46	3	0		0		0.0	0.00	24.83	30.03	3.3	21	7.3	29	21	23	18	24
25	73	54	64	11	39	51	1	0	RA	0		0.0	T	24.76	29.92	3.0	32	8.2	30	31	23	32	25
26	73	40	57	4	39	47	8	0	TS TSRA RA	0		0.0	0.04	24.63	29.81	6.5	10	14.1	46*	09	36*	09	26
27	52	37	45*	-7	31	38	20	0	RA	0		0.0	T	24.78	30.05	4.6	07	6.9			24	08	27
28	61	37	49	-3	30	40	16	0		0		0.0	0.00	24.91	30.21	1.5	33	3.5	13	33	9	32	28
29	66	36*	51	-1	25	40	14	0		0		0.0	0.00	24.83	30.10	3.0	36	3.7	24	35	18	35	29
30	67	43	55	4	22	40	10	0		0		0.0	0.00	24.90	30.14	2.2	36	4.5	17	34	13	35	30
31	70	42	56	5	24	41	9	0		0		0.0	0.00	24.82	30.07	1.7	05	3.5	14	36	12	36	31
	71.4	46.1	58.8	¤	31.5	45.5	6.3	0.3	< MONTHLY AVERAGES | TOTALS >			0.0	1.48	24.82	30.03	0.7	35	6.1	< MONTHLY AVERAGES				
	0.7	2.3	1.5		<---- DEPARTURE FROM NORMAL ---->								0.48	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	196	-52	196	-81
COOLING :	10	1	1716	426

GREATEST 24-HR PRECIPITATION : 0.98 DATE : 04-05
GREATEST 24-HR SNOWFALL : 0.0 DATE :
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.28	28	0856
MIMIMUM :	29.56	06	1356

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	0	MINIMUM TEMP <= 32 :	0	PRECIPITATION >= 0.01 INCH:	5
MAXIMUM TEMP <= 32 :	0	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	3
THUNDERSTORMS :	3	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

NOVEMBER 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35° 2'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	72*	42	57*	7	21	41	8	0		0		0.0	0.00	24.67	29.86	4.1	18	5.1	23	19	16	19	01
02	59	38	49	-1	18	35	16	0		0		0.0	0.00	24.92	30.17	5.7	36	10.8	37	35	26	34	02
03	54	30	42	-7	17	32	23	0		0		0.0	0.00	24.92	30.27	0.7	17	3.8	15	20	10	19	03
04	64	40	52	3	21	39	13	0		0		0.0	0.00	24.62	29.88	5.1	16	7.7	32	17	25	17	04
05	56	38	47	-1	25	38	18	0	RA VCBLDU	0		0.0	0.08	24.51	29.69	14.2	23	18.1	43*	24	32	28	05
06	52	29	41	-7	23	34	24	0		0		0.0	0.00	24.68	29.97	1.4	15	4.4	17	19	14	19	06
07	55	35	45	-3	26	36	20	0	RA	0		0.0	0.01	24.62	29.88	3.6	26	7.6	40	18	33	17	07
08	49	32	41	-6	24	33	24	0	SN	0		T	T	24.81	30.12	3.1	33	7.9	24	32	20	33	08
09	51	30	41	-6	22	32	24	0		0		0.0	0.00	25.04	30.42	4.4	34	4.9	15	33	13	34	09
10	53	27	40	-6	18	31	25	0		0		0.0	0.00	25.01	30.40	0.6	10	3.0	9	24	7	24	10
11	50	32	41	-5	17	33	24	0		0		0.0	0.00	24.76	30.08	2.6	14	4.4	15	19	13	18	11
12	65	39	52	6	23	39	13	0		0		0.0	0.00	24.65	29.87	5.9	23	8.9	32	28	24	28	12
13	55	44	50	5	32	42	15	0	RA	0		0.0	T	24.63	29.83	8.3	21	9.2	31	27	21	25	13
14	59	37	48	3	30	39	17	0		0		0.0	0.00	24.62	29.86	2.6	24	6.1	23	24	18	24	14
15	59	33	46	2	25	37	19	0		0		0.0	0.00	24.65	29.91	1.9	34	3.8	22	34	16	33	15
16	57	36	47	3	14	34	18	0		0		0.0	0.00	24.83	30.10	6.0	34	6.9	26	34	22	34	16
17	56	30	43	-1	17	33	22	0		0		0.0	0.00	24.83	30.15	1.5	07	5.7	16	36	14	36	17
18	63	35	49	6	21	36	16	0		0		0.0	0.00	24.60	29.86	3.3	17	5.9	21	27	16	29	18
19	61	40	51	8	21	38	14	0		0		0.0	0.00	24.62	29.82	5.3	19	6.5	17	23	14	18	19
20	63	47	55	12	25	41	10	0	RA	0		0.0	T	24.73	29.94	5.3	18	6.9	29	24	18	17	20
21	58	38	48	6	32	40	17	0	RA	0		0.0	T	24.75	30.00	2.8	33	5.1	39	28	33*	28	21
22	58	30	44	2	30	38	21	0		0		0.0	0.00	24.94	30.26	1.7	29	4.5	17	31	15	31	22
23	60	33	47	6	24	36	18	0		0		0.0	0.00	24.93	30.25	1.5	36	3.7	13	35	10	36	23
24	57	34	46	5	24	36	19	0	RA	0		0.0	T	24.79	30.08	0.6	18	4.7	38	18	29	17	24
25	55	44	50	9	35	42	15	0	RA	0		0.0	0.04	24.65	29.88	5.8	30	14.5	37	17	29	18	25
26	49	30	40	-1	12	31	25	0		0		0.0	0.00	25.01	30.33	7.6	35	9.2	41	33	31	34	26
27	51	26*	39*	-1	8	28	26	0		0		0.0	0.00	25.08	30.48	1.1	35	2.7	13	01	9	31	27
28	59	31	45	5	13	33	20	0		0		0.0	0.00	24.93	30.26	3.3	01	4.7	17	02	14	32	28
29	60	37	49	9	17	35	16	0		0		0.0	0.00	24.92	30.21	1.3	01	3.9	18	09	15	09	29
30	57	29	43	4	18	33	22	0		0		0.0	0.00	24.70	30.00	3.7	16	4.6	16	18	13	17	30
	57.2	34.9	46.1	¤	21.8	35.8	18.7	0.0	<MONTHLY AVERAGES | TOTALS>			T	0.13	24.78	30.06	1.2	25	6.5	<MONTHLY AVERAGES				
	0.1	3.3	1.7		<DEPARTURE FROM NORMAL>								-0.49	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	562	-52	758	-133
COOLING :	0	0	1716	426

GREATEST 24-HR PRECIPITATION : 0.08 DATE : 05
GREATEST 24-HR SNOWFALL : T DATE : 08
GREATEST SNOW DEPTH : 0 DATE :

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.60	27	0900
MIMIMUM :	29.47	05	0556

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	0	MINIMUM TEMP <= 32 :	12	PRECIPITATION >= 0.01 INCH:	3
MAXIMUM TEMP <= 32 :	0	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	0
THUNDERSTORMS :	0	HEAVY FOG :	0	SNOWFALL >= 1.0 INCH :	0

NOVEMBER 2011
ALBUQUERQUE, NM

DECEMBER 2011
LOCAL CLIMATOLOGICAL DATA
NOAA, National Climatic Data Center

ALBUQUERQUE, NM
ALBUQUERQUE INTL SUNPORT AIRPORT (KABQ)
Lat:35° 2'N Long: 106° 36'W Elev (Ground) 5310 Feet
Time Zone : MOUNTAIN WBAN: 23050 ISSN#: 0198-3482

Date	Temperature °F MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	Deg Days BASE 65° HEATING	COOLING	WEATHER	SNOW/ICE ON GND(IN) 0500 LST DEPTH	1100 LST WATER-EQUIV	PRECIPITATION ON GND(IN) 2400 LST SNOW-FALL	2400 LST WATER EQUIV	PRESSURE (INCHES OF HG) AVERAGE STATION	AVERAGE SEA LEVEL	WIND SPEED = MPH DIR = TENS OF DEGREES RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM 3-SEC SPEED	DIR	2-MIN SPEED	DIR	Date
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	53	32	43	4	19	33	22	0	VCBLDU	0		0.0	0.00	24.68	29.93	29.8	09	30.8	69*	08	54*	09	01
02	40	30	35	-4	24	30	30	0	SN BR	0		0.2	0.03	24.68	30.04	14.4	09	14.9	49	09	40	09	02
03	39	26	33	-5	29	31	32	0	DZ SN FG+ FG FZFG BCFG BR	1		0.7	0.10	24.65	29.98	4.5	18	5.9	25	21	21	22	03
04	37	26	32	-6	25	29	33	0	SN FG+ FZFG BR	T		0.2	T	24.69	30.07	3.8	11	5.0	36	08	28	09	04
05	27	14	21	-17	11	17	44	0	SN	1		1.0	0.02	24.82	30.25	19.7	09	20.0	46	08	37	09	05
06	30	9*	20*	-18	7	16	45	0	SN	0		T	T	24.89	30.40	4.2	34	5.4	22	34	16	33	06
07	38	17	28	-9	12	21	37	0		0		0.0	0.00	24.89	30.37	0.4	01	4.5	13	35	10	16	07
08	45	19	32	-5	17	25	33	0		0		0.0	0.00	24.79	30.20	0.7	25	2.6	12	14	9	15	08
09	45	24	35	-2	18	27	30	0		0		0.0	0.00	24.91	30.31	4.1	35	6.0	22	36	16	34	09
10	42	22	32	-5	18	26	33	0		0		0.0	0.00	24.92	30.35	1.7	01	3.8	13	02	9	36	10
11	42	20	31	-6	21	27	34	0		0		0.0	0.00	24.75	30.15	1.3	23	2.3	14	20	10	21	11
12	36	28	32	-4	28	31	33	0	RA SN FG+ FG BCFG BR HZ FU	0		T	0.24	24.70	30.07	3.5	34	4.8	17	05	15	05	12
13	46	35	41	5	37	39	24	0	RA FG+ FG BR	0		0.0	0.13	24.65	29.96	0.2	29	4.8	29	22	22	24	13
14	45	33	39	3	29	34	26	0	RA SN BR	0		T	0.10	24.75	30.05	3.7	27	7.1	18	26	15	26	14
15	43	26	35	-1	22	29	30	0		0		0.0	0.00	24.86	30.23	6.9	09	9.2	26	11	18	08	15
16	45	25	35	-1	21	29	30	0		0		0.0	0.00	24.96	30.36	4.3	36	5.6	18	09	15	09	16
17	48	26	37	1	20	30	28	0		0		0.0	0.00	25.00	30.41	4.6	35	4.7	16	35	14	35	17
18	45	28	37	2	28	33	28	0	RA	0		0.0	0.01	24.75	30.11	1.4	17	3.6	14	19	13	19	18
19	38	32	35	0	33	33	30	0	RA SN FG+ FG BCFG BR	0		1.4	0.56	24.54	29.82	0.8	23	4.3	18	03	16	03	19
20	38	26	32	-3	29	31	33	0	FG+ FZFG BR	1		0.0	0.00	24.68	30.04	1.4	14	3.5	13	14	10	14	20
21	41	23	32	-3	27	30	33	0	FG+ FZFG BR	0		0.0	0.00	24.60	29.95	2.9	16	3.5	12	16	9	16	21
22	41	24	33	-2	24	28	32	0	SN BLSN	0		0.7	0.01	24.75	30.10	12.7	10	13.9	51	08	40	08	22
23	36	23	30	-5	17	24	35	0	SN	1		0.1	T	24.94	30.38	6.0	05	10.6	43	07	35	07	23
24	38	18	28	-7	14	22	37	0		0		0.0	0.00	25.01	30.49	3.7	36	5.4	20	01	15	01	24
25	36	17	27	-8	16	23	38	0		0		0.0	0.00	25.00	30.48	0.6	27	3.6	12	36	10	35	25
26	43	16	30	-5	17	25	35	0		0		0.0	0.00	24.89	30.32	1.2	27	1.6	9	28	8	23	26
27	45	21	33	-2	19	26	32	0		0		0.0	0.00	24.90	30.32	1.6	18	3.1	9	20	8	12	27
28	51	25	38	3	17	30	27	0		0		0.0	0.00	24.92	30.30	1.1	30	4.3	13	01	10	01	28
29	56	27	42	8	19	32	23	0		0		0.0	0.00	24.81	30.14	1.1	36	2.5	10	04	9	05	29
30	57	27	42	8	26	35	23	0		0		0.0	0.00	24.81	30.14	2.5	15	3.0	13	15	10	15	30
31	61*	32	47*	13	22	35	18	0		0		0.0	0.00	24.86	30.15	2.2	36	9.4	31	34	21	35	31
	42.8	24.2	33.5	¤	21.5	28.4	31.2	0.0	<MONTHLY AVERAGES | TOTALS>			4.3	1.20	24.96	30.19	2.7	08	6.8	<MONTHLY AVERAGES				
	-5.1	0.0	-2.6		<—— DEPARTURE FROM NORMAL ——>								0.71	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									

DEGREE DAYS

	MONTHLY TOTAL	MONTHLY DEPARTURE	SEASON TO DATE TOTAL	SEASON TO DATE DEPARTURE
HEATING :	968	70	1726	-63
COOLING :	0	0	1716	426

GREATEST 24-HR PRECIPITATION : 0.57 DATE : 18-19
GREATEST 24-HR SNOWFALL : 1.4 DATE : 19
GREATEST SNOW DEPTH : 1 DATE : 23+

SEA LEVEL PRESSURE		DATE	TIME
MAXIMUM :	30.60	25	1002
MIMIMUM :	29.70	19	0756

NUMBER OF DAYS WITH ->

MAXIMUM TEMP >= 90 :	0	MINIMUM TEMP <= 32 :	29	PRECIPITATION >= 0.01 INCH:	9
MAXIMUM TEMP <= 32 :	2	MINIMUM TEMP <= 0 :	0	PRECIPITATION >= 0.10 INCH:	5
THUNDERSTORMS :	0	HEAVY FOG :	7	SNOWFALL >= 1.0 INCH :	2

DECEMBER 2011
ALBUQUERQUE, NM

Wind Erosion Calculation Sheet for Course Pile

				Pile Type:	Conical Pile A	Surface area	Us/Ur
Calculations based on:					0.2a =	5 %	0.2
					0.2b =	35 %	0.2
Disturbed Surface Area:	4640.8 meter^2	conical pile	1 Acres		0.6a =	48 %	0.6
Frequency of Distubance:	Total Pile 3 Day Disturbance				0.9 =	12 %	0.9
Roughness length:	0.3 cm						
Threshold Friction Velocity:	1.02 m/s						

Met Data: One year of maximum 2-minute mile data from Albuquerque Airport, 2011

Methodology: AP42 13.2.5

Zo	0.3	cm
u*t =	1.02	m/s
area (m2)	4640.831	m^2

Conical Pile

S = pi*r*(r^2+h^2)^.5

S = Surface Area sq meters

r = 37 meters

h = 15 meters

	TSP	PM10	PM2.5
g	979046.7	489523.4	73428.5
lbs	2158.392	1079.196	161.8794
tons	1.079196	0.539598	0.08094

Wind Erosion Calculation Sheet for Quarry

Calculations based on:

Disturbed Area:	684000	meter^2	flat pile	169	Acres
Frequency of Distubance:	Total Pile 3 Day Disturbance				
Roughness length:	0.3	cm			
Threshold Friction Velocity:	1.02	m/s			

Met Data: One year of maximum 2-minute mile data from Albuquerque Airport, 2011

Methodology: AP42 13.2.5

Zo	0.3
u*t =	1.02
area (m2)	684000

	TSP	PM10	PM2.5
g	12620511	6310256	946538.3
lbs	27822.996	13911.5	2086.725
tons	13.911498	6.955749	1.043362

Wind Erosion Calculation Sheet for Low Ore Area

Calculations based on:

Disturbed Area:	275196 meter^2	flat pile	68	Acres
Frequency of Distubance:	Total Pile 7 Day Disturbance			
Roughness length:	0.3 cm			
Threshold Friction Velocity:	1.02 m/s			

Met Data: One year of maximum 2-minute mile data from Albuquerque Airport, 2011
Methodology: AP42 13.2.5

Zo	0.3
u*t =	1.02
area (m2)	275196

	TSP	PM10	PM2.5
g	5077652	2538826	380823.9
lbs	11194.12	5597.059	839.5589
tons	5.597059	2.79853	0.419779

Wind Erosion Calculation Sheet for East Dump Area

Calculations based on:

Disturbed Area:	849870	meter^2	flat pile	210 Acres
Frequency of Distubance:	Total Area 7 Day Disturbance			
Roughness length:	0.3	cm		
Threshold Friction Velocity:	1.02	m/s		

Met Data: One year of maximum 2-minute mile data from Albuquerque Airport, 2011
Methodology: AP42 13.2.5

Zo	0.3
u*t =	1.02
area (m2)	849870

	TSP	PM10	PM2.5
g	15680985	7840493	1176074
lbs	34570.07	17285.04	2592.755
tons	17.28504	8.642518	1.296378

Wind Erosion Calculation Sheet for Tailings Area

Calculations based on:

Disturbed Area:	2213709	meter^2	flat pile	547	Acres
Frequency of Distubance:	Total Area 7 Day Disturbance				
Roughness length:	0.3	cm			
Threshold Friction Velocity:	1.12	m/s			

Met Data: One year of maximum 2-minute mile data from Albuquerque Airport, 2011

Methodology: AP42 13.2.5

Zo	0.3
u*t =	1.12
area (m2)	2213709

	TSP	PM10	PM2.5
g	13080731	6540365	981054.8
lbs	28837.59	14418.79	2162.819
tons	14.41879	7.209397	1.08141

Copper Flat Mine - Wind Erosion Calculation Totals

				Uncontrolled						Controlled					
				TSP		PM10		PM2.5		TSP		PM10		PM2.5	
Emission Unit ID	**Source Description**	**Rated Capacity**	**Emission Calculation Method**	**(lbs/hr)**	**TPY**	**(lbs/hr)**	**TPY**	**(lbs/hr)**	**TPY**	**(lbs/hr)**	**TPY**	**(lbs/hr)**	**TPY**	**(lbs/hr)**	**TPY**
	Course Pile Wind Erosion	4,641 sqmeters	AP42-13.2.5-2	0.2	1.1	0.12	0.5	0.018	0.08	0.25	1.1	0.12	0.54	0.018	0.081
	Quarry Area Wind Erosion	684,000 sqmeters	AP42-13.2.5-2	3.18	13.9	1.59	7.0	0.238	1.04	3.2	14	1.6	7.0	0.24	1.0
	Low Ore Area Wind Erosion	275,196 sqmeters	AP42-13.2.5-2	1.28	5.6	0.64	2.8	0.096	0.42	1.3	5.6	0.64	2.8	0.096	0.42
	East Dump Area Wind Erosion	849,870 sqmeters	AP42-13.2.5-2	3.95	17.3	1.97	8.6	0.296	1.30	3.9	17	2.0	8.6	0.30	1.3
	Tailings Area Wind Erosion	2,213,709 sqmeters	AP42-13.2.5-2	3.3	14.4	1.65	7.2	0.247	1.08	3.3	14	1.6	7.2	0.25	1.1
				11.9	**52**	**6.0**	**26**	**0.90**	**3.9**	**11.9**	**52**	**6.0**	**26**	**0.90**	**3.9**

Copper Flat Mine
Emission Inventory Assnmptions

Hours of Operation			
Uncontrolled	8760	hrs/year	
Controlled	8760	hrs/year	
Mining			
In Pit	1717	tph average annually	
	41211	tpd average annually	
	15042000	tpy	
Crusher	1042	tph average annually	
	25000	tpd average annually	
	9125000	tpy	
Low Grade Copper Ore Pile	30	tph average annually	
	732	tpd average annually	
	267000	tpy	
Waste Pile	645	tph average annually	
	15479	tpd average annually	
	5650000	tpy	
Tailings	1300000	tpy	dam sand from cyclone
Production			
Copper	11.5	tph average annually	
Copper	100700	tpy	
Moly	930	tpy	
Low Grade Copper Ore	267000	tpy	
Copper	8	% Moisture Content	
Mine			
Bulldozer %silt (s)	6.9	%	AP-42 Section 13.2.4, Table 13.2.4-1 "Western Coal Mining - Overburden"
Bulldozer %moisture (M)	2.2	%	Projected to be between the ranges of 2.2 to 3.4 percent
Operation	8760	hours/yr	
Operation	24	hours/day	
Bulldozer Operations	24	hours/day	
Bulldozer Material Pushed	45	%	
tons loaded into trucks	100	tons/load	
tons loaded into trucks	1717	tons/hr	
tons loaded into trucks	15042000	tons/yr	
Blast Area	24600	sq. ft.	
# of Blasts	290	year	
ANFO	6400	tons/yr	
ANFO	22	tons/blast	
Drill holes	100	per blast	
Drill holes	29000	per year	
Prill	3650	tons/yr	
Prill % Moisture Content	1	%	Estimated based on physical properties
Course Ore Stockpile			
Low Grade Stockpile	9125000.0	tons/hr	
Bulldozer %silt (s)	6.9	%	AP-42 Section 13.2.4, Table 13.2.4-1 "Western Coal Mining - Overburden"
Bulldozer %moisture (M)	2.2	%	Projected to be between the ranges of 2.2 to 3.4 percent
Bulldozer %moisture (M)	2.88	%	Wet suppresion moisture content
Bulldozer Operations	24	hours/day	

Copper Flat Mine
Emission Inventory Assumptions

Bulldozer Material Pushed	33	%	

Low Grade Ore

Low Grade Stockpile	30.5	tons/hr	
Waste Truck Loads	100	tons/load	
Bulldozer %silt (s)	6.9	%	AP-42 Section 13.2.4, Table 13.2.4-1 "Western Coal Mining - Overburden"
Bulldozer %moisture (M)	2.2	%	Projected to be between the ranges of 2.2 to 3.4 percent
Bulldozer Operations	16	hours/day	
Bulldozer Material Pushed	33	%	

Waste

East Waste Stockpile	645	tons/hr	
Waste Truck Loads	100	tons/load	
Bulldozer %silt (s)	6.9	%	AP-42 Section 13.2.4, Table 13.2.4-1 "Western Coal Mining - Overburden"
Bulldozer %moisture (M)	2.2	%	Projected to be between the ranges of 2.2 to 3.4 percent
Bulldozer Operations	24	hours/day	
Bulldozer Material Pushed	33	%	

Tailing

Tailing	148	tons/hr	
Bulldozer %silt (s)	6.9	%	AP-42 Section 13.2.4, Table 13.2.4-1 "Western Coal Mining - Overburden"
Bulldozer %moisture (M)	10	%	
Bulldozer Operations	24	hours/day	
Bulldozer Material Pushed	33	%	

Roads

Product Trucks

Truck Capacity	25	tons/load	
Truck Empty Weight	15	tons	
Total Trucks per Year	4065.2	trucks per y	19687.14
	101630	tons/yr	

Road width	Model Width	Sigma Y	Truck Height	Volume height	Release height	Sigma z
24 ft	13 m	6.19	13.1 ft	6.79 m	3.39 m	3.16

Mine Trucks to Crusher

Truck Capacity	100	tons/load
Truck Empty Weight	50	tons
Total Trucks per Year	91250	trucks/yr

Road width	Model Width	Sigma Y	Truck Height	Volume height	Release height	Sigma z
90 ft	33 m	15.55	25 ft	12.95 m	6.48 m	6.03

Low Grade Ore Trucks

Truck Capacity	100	tons/load
Truck Empty Weight	50	tons
Waste Trucks per Year	2670	trucks/yr

Road width	Model Width	Sigma Y	Truck Height	Volume height	Release height	Sigma z
90 ft	33 m	15.55	25 ft	12.95 m	6.48 m	6.03

Waste Trucks

Truck Capacity	100	tons/load
Truck Empty Weight	50	tons
Waste Trucks per Year	56500	trucks/yr

Road width	Model Width	Sigma Y	Truck Height	Volume height	Release height	Sigma z
90 ft	33 m	15.55	25 ft	12.95 m	6.48 m	6.03

Light Vehicles/Maintenance

Trucks	5	
Vechicle weight	10	ton

Copper Flat Mine
Emission Inventory Assumptions

VMT/Truck	10000	miles/yr/truck	
Total Light Vehicle	50000	miles/yr	
Chemical Delivery			
Truck Capacity	25	tons/load	
Truck Empty Weight	15	tons	
Trucks per Year	492.75	trucks/yr	2386.3127
	12319	tons/yr	
Grader			
Speed	5	mph	
VMT/hr	5	mph	
Operation	5000	hours/yr	
Travel Distance Trucks			
Pit to Crusher	2695	meters one way	
Pit to Low Ore Stockpile	3215	meters one way	
Pit to East Waste Stockpile	3479	meters one way	
Plant to Exit	3896	meters one way	
%Road Control Efficiency			
Haul Road	93	%	
Product Road	80	%	
Water Spray & Enclosure	95	%	
Full Enclosure Control	85	%	
3/4 Enclosure Control	70	%	
1/2 Enclosure Control	50	%	
Water Spray	75	%	
Tailing			
Scraper Loading	780000	tons for 4 years	
Scraper Unloading	780000	tons for 4 years	
Scraper Travel	800	meters one way	
Scraper Weight (Travel Mode)	62	tons	
Scraper Capacity	50	tons	
Scraper Trips	3900	year	
Topsoil Moisture Content	2	%	NMED Default
Wind speed onsite	11.1	MPH 2011	
Crusher Baghouse	12000	ACFM	
Reclaim Baghouse	12000	ACFM	
Moly Area Baghouse	12000	ACFM	
Lime Silo Baghouse	500	ACFM	
Wind Erosion			
Course Pile Wind Erosion	4,640.80	Sq Meters	1.1 Acres
Quarry Area Wind Erosion	95,463	Sq Meters	24 Acres
Low Ore Area Wind Erosion	70,079	Sq Meters	17 Acres
East Dump Area Wind Erosion	699,171	Sq Meters	173 Acres
Tailings Area Wind Erosion	1,800,085	Sq Meters	445 Acres

Copper Flat Mine
Mining Operations

Material Throughput	15042000	tons per year
Hours per Day	24	hours
Hours per Year	8760	hours

Bulldozing In Pit (most ore is ripped by bulldozer and placed in piles for truck loading)

AP-42 Section 11.9 Table 11.9-1 "Bulldozing Overburden" (ver 07/98)

Bulldozer operations will occur 24 hours per day with 50% of the time material moved

TSP Emission Equation
5.7(s)^1.2/(M)^1.3 * hours

PM15 Emission Equation
1.0(s)^1.5/(M)^1.4 * hours

PM10 factor	0.75	
PM2.5 factor (TSP Equation)	0.105	
Bulldozer Hours	24	hours per day
Material Moved Percentage	45	%

6.9 %silt (s)
2.2 %moisture (M)

	lbs/hr	lbs/day	tons/yr
Uncontrolled TSP	20.77	224.3	40.93
Uncontrolled PM10	4.51	48.7	8.88
Uncontrolled PM2.5	2.18	23.5	4.30

Haul Truck Loading In Pit

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Crusher	9125000	ton/yr	
Max Low Grade Copper Ore	267000	ton/yr	
Max Waste	5650000	ton/yr	
Max Total	15042000	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	2.2	%	Moisture Content

	lbs/hr	tons/yr
Uncontrolled TSP	10.03	43.95
Uncontrolled PM10	4.75	20.79
Uncontrolled PM2.5	0.72	3.15

Drilling In Pit

AP-42 Section 11.9 Table 11.9-4 "Drilling" (ver 07/98)

TSP factor	1.3	lbs/hole	
PM10 factor	0.68	lbs/hole	
PM2.5 factor	0.136	lbs/hole	PM2.5/PM10 Ratio = 0.2

100 # Holes per blast
29000 # Holes per year

	lbs/blast	tons/yr
Uncontrolled TSP	130.000	18.850
Uncontrolled PM10	68.000	9.860

Uncontrolled PM2.5	13.600	1.972

Blasting In Pit

AP-42 Section 11.9 Table 11.9-1 "Blasting Overburden" (ver 07/98)

TSP Emission Equation
0.000014(A)^1.5

PM10 factor	0.52
PM2.5 factor	0.03

24600	Blast Area (A) sq. ft.
290	Blast per year
1	Blast per day

	lbs/Blast	lbs/hr/day	tons/yr
Uncontrolled TSP	54.02	2.251	7.832
Uncontrolled PM10	28.09	1.170	4.073
Uncontrolled PM2.5	1.62	0.0675	0.2350

ANFO	22	tons/blast
	6400	tons/yr

Emission Factors "AP-42 Section 13.3 Table 13.3-1"

NOx	17	lbs/ton
CO	67	lbs/ton
SO2	2	lbs/ton

Emission Rate

	lbs/Blast/day	tons/yr
NOx	375	54
CO	1479	214
SO2	44	6.4

Copper Flat Mine
Processing Plant Operations

Material Throughput	41210.959	tons per day
Hours per Day	24	hours
Hours per Year	8760	hours

ROM Ore Unloading to Surge Bin

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Crusher	9125000	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	2.2	%	Moisture Content
Control Efficiency	75	%	Mojave AQMD Mineral Handling and Processing Industries Sec E Table 5

	lbs/hr	tons/yr
Uncontrolled TSP	6.09	26.66
Uncontrolled PM10	2.88	12.61
Uncontrolled PM2.5	0.436	1.91

	lbs/hr	tons/yr
Controlled TSP	1.52	6.67
Controlled PM10	0.72	3.15
Controlled PM2.5	0.11	0.48

Surge Bin drop to Apron Feeder

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
Ver 8/2004

E(TSP) =	0.00300	lbs/ton
E(PM10) =	0.00110	lbs/ton
E(PM2.5) =	0.00017	lbs/ton

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"
Ver 8/2004

E(TSP) =	0.00014	lbs/ton
E(PM10) =	0.000045	lbs/ton
E(PM2.5) =	0.000013	lbs/ton

Throughput 9125000 tpy

	lb/hr	tons/yr
E(tsp) Uncontrolled	3.1	14
E(pm10) Uncontrolled	1.1	5.0
E(pm2.5) Uncontrolled	0.18	0.78

PM emissions controlled with Crusher Dust Collector

Copper Flat Mine
Processing Plant Operations

Crusher

AP-42 Table 11.19.2-2 "Tertiary Crusher Uncontrolled"
Ver 8/2004

E(TSP) =	0.00540	lbs/ton
E(PM10) =	0.00240	lbs/ton
E(PM2.5) =	0.00036	lbs/ton

Throughput 9125000 tpy

	lb/hr	tons/yr
E(tsp) Uncontrolled	5.6	25
E(pm10) Uncontrolled	2.5	11
E(pm2.5) Uncontrolled	0.38	1.6

Based on Air Flow Rate of 12000 ACFM and Grain Loading of 0.01 Grain/ACF

Baghouse flowrate	12000	ACFM
Grain Loading	0.01	grains/cfm

E(tsp) Controlled	1.03	4.5
E(pm10) Controlled	1.03	4.5
E(pm2.5) Controlled	1.03	4.5

Crusher Apron Conveyor Unloading

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
Ver 8/2004

E(TSP) =	0.00300	lbs/ton
E(PM10) =	0.00110	lbs/ton
E(PM2.5) =	0.00017	lbs/ton

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"
Ver 8/2004

E(TSP) =	0.00014	lbs/ton
E(PM10) =	0.000045	lbs/ton
E(PM2.5) =	0.000013	lbs/ton

Throughput 9125000 tpy

	lb/hr	tons/yr
E(tsp) Uncontrolled	3.1	14
E(pm10) Uncontrolled	1.1	5.0
E(pm2.5) Uncontrolled	0.18	0.78

PM emissions controlled with Crusher Dust Collector

Material Drop to Course Ore Storage Pile
AP-42 13.2.4 (ver 11/06)
E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Copper TPH	9125000	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	2.2	%	Moisture Content
Control Efficiency	75	%	Water Spray

	lbs/hr	tons/yr
Uncontrolled TSP	6.09	26.66
Uncontrolled PM10	2.88	12.61
Uncontrolled PM2.5	0.44	1.91

	lbs/hr	tons/yr
Controlled TSP	1.52	6.67
Controlled PM10	0.72	3.15
Controlled PM2.5	0.11	0.48

Maintenance of Course Ore Stockpile
AP-42 Section 11.9 Table 11.9-1 "Bulldozing Overburden" (ver 07/98)

TSP Emission Equation
5.7(s)^1.2/(M)^1.3 * hours

PM15 Emission Equation
1.0(s)^1.5/(M)^1.4 * hours

PM10 factor	0.75	
PM2.5 factor (TSP Equation)	0.105	
Bulldozer Hours	24	hours per day
Bulldozer Hours	8760	hours per year
Material Moved Percentage	33	%

6.9 %silt (s)
2.2 %moisture (M) Uncontrolled
2.88 %moisture (M) Controlled

	lbs/hr	lbs/day	tons/yr
Uncontrolled TSP	20.77	164.5	30.01
Uncontrolled PM10	4.51	35.7	6.52
Uncontrolled PM2.5	2.18	17.3	3.15

	lbs/hr	lbs/day	tons/yr
Controlled TSP	14.63	115.9	21.15
Controlled PM10	3.09	24.5	4.47
Controlled PM2.5	1.54	12.2	2.22

Copper Flat Mine
Processing Plant Operations

Material Drop to Reclaimer
AP-42 13.2.4 (ver 11/06)
E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

	9125000 ton/yr	
k(tsp)	0.74	
k(pm10)	0.35	
k(pm2.5)	0.053	
U Max	11.1 MPH	2011 Site Ave WS
U Ave	11.1 MPH	2011 Site Ave WS
M	2.2 %	Moisture Content

	lbs/hr	tons/yr
Uncontrolled TSP	6.09	26.66
Uncontrolled PM10	2.88	12.61
Uncontrolled PM2.5	0.44	1.91

Based on Air Flow Rate of 12000 ACFM and Grain Loading of 0.01 Grain/ACF

Baghouse flowrate	12000	ACFM
Grain Loading	0.01	grains/cfm

	lbs/hr	tons/yr
Controlled TSP	1.03	4.5
Controlled PM10	1.03	4.5
Controlled PM2.5	1.03	4.5

Material Drop to Reclaimer Conveyor
AP-42 13.2.4 (ver 11/06)
E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Copper TPH	9125000 ton/yr	
k(tsp)	0.74	
k(pm10)	0.35	
k(pm2.5)	0.053	
U Max	11.1 MPH	2011 Site Ave WS
U Ave	11.1 MPH	2011 Site Ave WS
M	2.2 %	Moisture Content

	lbs/hr	tons/yr
Uncontrolled TSP	6.09	26.66
Uncontrolled PM10	2.88	12.61
Uncontrolled PM2.5	0.44	1.91

PM emissions controlled with Reclaim Dust Collector

Material Drop to Wet Mill

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

	9125000	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	2.2	%	Moisture Content
Control Efficiency	96.25	%	Enclosed + Moisture; 85% + 75%

	lbs/hr	tons/yr
Uncontrolled TSP	6.09	26.66
Uncontrolled PM10	2.88	12.61
Uncontrolled PM2.5	0.44	1.91

	lbs/hr	tons/yr
Controlled TSP	0.23	1.00
Controlled PM10	0.11	0.47
Controlled PM2.5	0.02	0.07

Copper Flat Mine
Product Loadout Operations

Copper Product Storage Pile

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Copper	100700	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	8	%	Moisture Content

	lbs/hr	tons/yr
Uncontrolled TSP	0.011	0.048
Uncontrolled PM10	0.0052	0.023
Uncontrolled PM2.5	0.00079	0.0035

Control Efficiency	85	%	Full Enclosure

	lbs/hr	tons/yr
Controlled TSP	0.00165	0.0072
Controlled PM10	0.00078	0.0034
Controlled PM2.5	0.00012	0.0005

Moly Product Storage Pile/Bagging

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Moly	930	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	2	%	Moisture Content

	lbs/hr	tons/yr
Uncontrolled TSP	0.00071	0.00311
Uncontrolled PM10	0.000335	0.00147
Uncontrolled PM2.5	0.000051	0.000222

Controlled emissions based on 0.01 grains/cubic foot

Baghouse flowrate	12000	ACFM
Grain Loading	0.01	grains/cfm

	lbs/hr	tons/yr
Controlled TSP	1.03	4.5
Controlled PM10	1.03	4.5
Controlled PM2.5	1.03	4.5

Copper Flat Mine
Product Loadout Operations

Copper Product Truck Loading

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Copper TPH	100700	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	8	%	Moisture Content

Copper

	lbs/hr	tons/yr
Uncontrolled TSP	0.011	0.048
Uncontrolled PM10	0.005	0.023
Uncontrolled PM2.5	0.001	0.0035

Control Efficiency	70	%	3/4 Enclosed

	lbs/hr	tons/yr
Controlled TSP	0.00331	0.0145
Controlled PM10	0.00156	0.0069
Controlled PM2.5	0.00024	0.0010

Moly Product Truck Loading

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max Copper TPH	930	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Max	11.1	MPH	2011 Site Ave WS
U Ave	11.1	MPH	2011 Site Ave WS
M	2	%	Moisture Content

Moly

	lbs/hr	tons/yr
Uncontrolled TSP	0.00071	0.00311
Uncontrolled PM10	0.00034	0.00147
Uncontrolled PM2.5	0.00005	0.00022

PM emissions controlled with Moly Dust Collector

Copper Flat Mine
Low Ore Stockpile Operations

Low Ore	30	tons per hour truck unloading
Low Ore	267000	tons per year truck unloading
Low Ore Area Hours	8760	hours per year
Wind Erosion Hours	8760	hours per year

Haul Truck Unloading at Low Ore Stockpile

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max	267000	ton/yr
k(tsp)	0.74	
k(pm10)	0.35	
k(pm2.5)	0.053	
U	11.1	MPH
Uannual	11.1	MPH
M	2.2	%

	lbs/hr	tons/yr
Uncontrolled TSP	0.178	0.78
Uncontrolled PM10	0.084	0.369
Uncontrolled PM2.5	0.0128	0.056

Bulldozing In Low Ore Stockpile

AP-42 Section 11.9 Table 11.9-1 "Bulldozing Overburden" (ver 07/98)

TSP Emission Equation

5.7(s)^1.2/(M)^1.3 * hours

PM15 Emission Equation

1.0(s)^1.5/(M)^1.4 * hours

PM10 factor	0.75	
PM2.5 factor (TSP Equation)	0.105	
Bulldozer Hours	16	hours per day
Bulldozer Hours	5840	hours per year
Material Moved Percentage	33	%

6.9 %silt (s)

2.2 %moisture (M)

	lbs/hr	lbs/day	tons/yr
Uncontrolled TSP	20.77	109.6	20.01
Uncontrolled PM10	4.51	23.8	4.34
Uncontrolled PM2.5	2.18	11.5	2.10

Copper Flat Mine
Waste Ore Stockpile Operations

Waste Material Throughput	645	tons per hour truck unloading
Waste Material Throughput	5650000	tons per year truck unloading
Waste Area Hours	8760	hours per year
Wind Erosion Hours	8760	hours per year

Haul Truck Unloading at East Dump

AP-42 13.2.4 (ver 11/06)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max tph	5650000	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U	11.1	MPH	
Uannual	11.1	MPH	
M	2.2	%	Conservative value for moisture content

	lbs/hr	tons/yr
Uncontrolled TSP	3.77	16.51
Uncontrolled PM10	1.78	7.81
Uncontrolled PM2.5	0.270	1.18

Bulldozing In East Dump Area

AP-42 Section 11.9 Table 11.9-1 "Bulldozing Overburden" (ver 07/98)

TSP Emission Equation

5.7(s)^1.2/(M)^1.3 * hours

PM15 Emission Equation

1.0(s)^1.5/(M)^1.4 * hours

PM10 factor	0.75	
PM2.5 factor (TSP Equation)	0.105	
Bulldozer Hours	24	hours per day
Bulldozer Hours	8760	hours per year
Material Moved Percentage	33	%

6.9 %silt (s)

2.2 %moisture (M)

	lbs/hr	lbs/day	tons/yr
Uncontrolled TSP	20.77	164.5	30.01
Uncontrolled PM10	4.51	35.7	6.52
Uncontrolled PM2.5	2.18	17.3	3.15

Copper Flat Mine
Unpaved Roads

Unpaved Road Equation AP-42 Section 13.2.2 (11/06)
E =[k (s/12)^a x (W/3)^b] x [(365-P)/365] (Equations 1a and 2)

	PM2.5	PM10	PM30	
k	0.15	1.5	4.9	Table 13.2.2-2
a	0.9	0.9	0.7	Table 13.2.2-2
b	0.45	0.45	0.45	Table 13.2.2-2
s haul roads	8.4	8.4	8.4	Table 13.2.2-1 "Sand and Gravel"
s product roads	5.1	5.1	5.1	Table 13.2.2-1 "Sand and Gravel"
s Scraper Route	16.4	16.4	16.4	Table 11.9-4 "Scraper"
W	92.63	92.63	92.63	Average of Mine Haul Trucks
W	27.50	27.50	27.50	Average Mine Product Trucks
W	37.00	37.00	37.00	Scraper
P	60	60	60	AP-42 Figure 13.2.1-2
Uncontrolled Mine Haul Trucks				
lb/VMT	0.50935	5.00348	17.86899	
lb/hr	35.51	355.06	1245.62	
tpy	129.95	1299.52	4558.99	
Uncontrolled Product Trucks				
lb/VMT	0.18821	1.88207	7.29564	
lb/hr	0.47	4.74	18.38	
tpy	1.74	17.36	67.28	
Uncontrolled Scraper Travel Mode				
lb/VMT	0.61542	6.15423	18.88627	
lb/hr	0.27	2.72	8.36	
tpy	1.00	9.97	30.60	
% Control Efficiency	93	93	93	Mine Haul Trucks - Water and/or Surfactants
% Control Efficiency	80	80	80	Product Exit - Water or Base Course
% Control Efficiency	60	60	60	Scraper Route
Controlled Mine Haul Trucks				
lb/hr	2.49	24.85	87.19	
tpy	9.10	90.97	319.13	
annual lb/hr	2.08	20.77	72.86	
Controlled Product Trucks				
lb/hr	0.09	0.95	3.68	
tpy	0.35	3.47	13.46	
annual lb/hr	0.08	0.79	3.07	
Controlled Scraper Travel Mode				
lb/hr	0.11	1.09	3.34	
tpy	0.40	3.99	12.24	
annual lb/hr	0.09	0.91	2.79	

91250	305642.6	30564259.06
2670	10669.2	1066918.848
56500	244336.8	24433676.69
	50000	500000
	610648.58	56564856
3900	3878.2	387818.5206
	3878.185206	38781.85206
	7756.370416	426600.3729

Average Weight of Vehicle

Truck Routes	Trucks/Day	Unload Weight (tons)	Load Weight (tons)	Average Weight (tons)	Round Trip (Meters)	VMT/Day	Normalize Weight	Fleet Average Weight (tons)	TSP Controlled Lbs/Hr
Haul Trucks Crusher	250.0	50	100	100	5389	837.38	83737.70		43.64232269
Haul Trucks Low Ore	7.3	50	100	100	6429	29.23	2923.07		1.52344006
Haul Trucks Waste	154.8	50	100	100	6958	669.42	66941.58		34.88854292
Light Vehicles				10		136.99	1369.86		7.139437375
						1673.01	154972.21	92.63	87.19374304
Haul Trucks Product/Chemical	12.5	15	25	27.5	7792	60.48	1663.07		3.876712268
						60.48	1663.07	27.50	
Scraper	10.7	12	50	37	1600	10.68	393.13		3.344494941
						10.63	393.13	37.00	
Total	424.6								94.21495025

Total Haul Truck Traffic Mileage 610649 Miles/Yr
Total Delivery Truck Traffic Mileage 22073 Miles/Yr

Material Throughput	1300000	tons per year
Hours per Day	24	hours
Hours per Year	8760	hours

Bulldozing At Tailings

AP-42 Section 11.9 Table 11.9-1 "Bulldozing Overburden" (ver 07/98)
Bulldozer operations will occur 24 hours per day with 40% of the time material moved

TSP Emission Equation
5.7(s)^1.2/(M)^1.3 * honrs

PM15 Emission Eqnation
1.0(s)^1.5/(M)^1.4 * hours

PM10 factor	0.75	
PM2.5 factor (TSP Equation)	0.105	
Bulldozer Hours	24	hours per day
Material Moved Percentage	33	%

6.9 %silt (s)
10.0 %moisture (M)

	lbs/hr	lbs/day	tons/yr
Uncontrolled TSP	2.90	23.0	4.19
Uncontrolled PM10	0.54	4.3	0.78
Uncontrolled PM2.5	0.30	2.4	0.44

Scraper Loading

AP-42 Section 11.9 Table 11.9-4 "Topsoil Removal by Scraper" (ver 07/98)

TSP Emission Equation	0.058	lbs/ton
PM10 = TSP * 0.35/0.74	0.02743243	lbs/ton
PM2.5 = TSP * 0.053/0.74	0.00415405	lbs/ton

Material Moved	195000	tpy

	lbs/hr	tons/yr
Uncontrolled TSP	1.29	5.66
Uncontrolled PM10	0.61	2.67
Uncontrolled PM2.5	0.09	0.41

Scraper Unloading

AP-42 13.2.4 (ver 11/06)
E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

Max tph	195000	ton/yr	
k(tsp)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U	11.1	MPH	
Uannual	11.1	MPH	
M	2	%	NMED Defanlt

	lbs/hr	tons/yr
Uncontrolled TSP	0.15	0.65

Uncontrolled PM10	0.070	0.31
Uncontrolled PM2.5	0.011	0.05

Copper Flat Mine
Wind Erosion

				Uncontrolled						Controlled					
				TSP		PM10		PM2.5		TSP		PM10		PM2.5	
Emission Unit ID	Source Description	Rated Capacity	Emission Calculation Method	(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
	Course Pile Wind Erosion	4,641 sqmeter	AP42-13.2.5-2	0.25	1.1	0.12	0.54	0.018	0.081	0.25	1.1	0.12	0.54	0.018	0.081
	Open Pit Area Wind Erosion	684,000 sqmeter	AP42-13.2.5-2	3.2	14	1.6	7.0	0.24	1.0	3.2	14	1.6	7.0	0.24	1.0
	Low Grade Ore Area Wind Erosion	275,196 sqmeter	AP42-13.2.5-2	1.3	5.6	0.64	2.8	0.096	0.42	1.3	5.6	0.64	2.8	0.096	0.42
	Waste Ore Area Wind Erosion	849,870 sqmeter	AP42-13.2.5-2	3.9	17	2.0	8.6	0.30	1.3	3.9	17	2.0	8.6	0.30	1.3
	Tailings Area Wind Erosion	2,213,709 sqmeter	AP42-13.2.5-2	3.3	14	1.6	7.2	0.25	1.1	3.3	14	1.6	7.2	0.25	1.1
				12	**52**	**6.0**	**26**	**0.90**	**3.9**	**12**	**52**	**6.0**	**26**	**0.90**	**3.9**

Copper Flat Mine
Chemical Deliveries

Name	Rate lbs/ton ore	Rate lbs/year	Rate tons/year
Copper Circuit			
Potassium Amyl Xanthate	0.03	273750	137
Butyl Dithiophosphate	0.01	91250	46
Methyl isobutyl Carbinol	0.12	1095000	548
#2 Diesel Fuel	0.13	1186250	593
Lime	2.4	21900000	10950
Flocculant	0.01	91250	46
Sodium Hydrosulfide	0.03	273750	137
			12319

Lime Silo

Uncontrolled emissions based on AP-42 Section 11.12 "Concrete Batching" Table 11.12-2 "Cement Unloading to Elevated Storage Silo"

E(TSP) =	0.72 lbs/ton	Uncontrolled Cement Silo Loading TSP
E(PM10) =	0.46 lbs/ton	Uncontrolled Cement Silo Loading PM10
E(PM2.5) =	0.036 lbs/ton	Uncontrolled Cement Silo Loading PM2.5 (TSP * 0.05025; Table 11.12-3 Uncontrolled)

Max tph Lime 25 tph Max

10950.00 tons/yr uncontrolled
10950.00 tons/yr controlled

	lb/hr	tons/yr
E(tsp) uncontrolled	18.00000	3.94200
E(pm10) uncontrolled	11.50000	2.51850
E(pm2.5) uncontrolled	0.90000	0.19710

Controlled Emission Based on Air Flow Rate of 500 ACFM and Grain Loading of 0.01 Grain/ACF

ACFM = 500
Grain loading = 0.01 grains/cubic foot

	lb/hr	tons/yr
E(tsp) controlled	0.043	0.0094
E(pm10) controlled	0.043	0.0094
E(pm2.5) controlled	0.043	0.0094

New Mexico Copper Corporation
Copper Flat Mine
NSR Minor Source Air Quality Permit Application Emissions Inventory

Uncontrolled Facility Emission Rates

		NOx		CO		SO2		VOC		TSP		PM10		PM2.5	
Unit ID	Unit Description	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
S1	Drilling – Open Pit									5.4	19	2.8	9.9	0.57	2.0
S2	Blasting – Open Pit		54		214		6.4			54	7.8	28	1.2	1.6	0.068
S3	Prill Silo Loading									0.88	0.064	0.42	0.030	0.063	0.0046
S4	Truck Loading - Open Pit									10	44	4.7	21	0.72	3.1
S5	Bulldozer – Open Pit									21	41	4.5	8.9	2.2	4.3
S6	Raw Ore Unloading to Surge Bin									6.1	27	2.9	13	0.44	1.9
S7	Drop from Surge Bin to Apron Feeder									3.1	14	1.1	5.0	0.18	0.78
S8	Primary Crusher									5.6	25	2.5	11	0.38	1.6
S9	Primary Crusher Apron Conveyor TP									3.1	14	1.1	5.0	0.18	0.78
S10	Stacker Conveyor Drop to Course Ore Storage Pile									6.1	27	2.9	13	0.44	1.9
S11	Bulldozer Maintenance of Course Ore Storage Pile									21	30	4.5	6.5	2.2	3.2
S12	Course Ore Storage Pile Drop to Reclaimer									6.1	27	2.9	13	0.44	1.9
S13	Reclaimer Drop to Reclaim Conveyor									6.1	27	2.9	13	0.44	1.9
S14	Reclaim Conveyor Drop to Wet Mill									6.1	27	2.9	13	0.44	1.9
S15	Lime Silo Loading									18	3.9	12	2.5	0.90	0.20
S16	Drop to Molybdenum Storage Pile									0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S17	Drop to Molybdenum Bagger														
S18	Drop to Copper Concentrate Storage Pile									0.011	0.048	0.0052	0.023	0.00079	0.0035
S19	Product Loading Trucks Molybdenum									0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S20	Product Loading Trucks Copper Concentrate									0.011	0.048	0.0052	0.023	0.00079	0.0035
S21	Truck Unloading Low Grade Ore Stockpile									0.18	0.78	0.084	0.37	0.013	0.056
S22	Bulldozer Low Grade Ore Stockpile Area									21	20	4.5	4.3	2.2	2.1
S23	Truck Unloading Waste Dump Stockpile									3.8	17	1.8	7.8	0.27	1.2
S24	Bulldozer Waste Dump Stockpile Area									21	30	4.5	6.5	2.2	3.2
S25	Bulldozer Tailings Dam Area									2.9	4.2	0.54	0.78	0.30	0.44
S26	Scraper Loading Tailings Area									1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading Tailings Area									0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel Mode									8.4	31	2.7	10	0.27	1.0
S29	Truck Traffic Mine Trucks/Light Vehicles									1246	4559	355	1300	36	130
S30	Truck Traffic Product/Chemical Delivery Trucks									18	67	4.7	17	0.47	1.7
S31	Grader – Road Maintenance									11	28	3.8	9.6	0.35	0.87
S32	Wind Erosion Course Ore Pile									0.25	1.1	0.12	0.54	0.018	0.081
S33	Wind Erosion Open Pit Area									3.2	14	1.6	7.0	0.24	1.0
S34	Wind Erosion Low Grade Ore Stockpile Area									1.3	5.6	0.64	2.8	0.10	0.42
S35	Wind Erosion Waste Dump Stockpile Area									3.9	17	2.0	8.6	0.30	1.3
S36	Wind Erosion Tailings Area									3.3	14	1.6	7.2	0.25	1.1
	Uncontrolled Facility Totals		54		214		6.4			1518	5145	460	1519	54	170

New Mexico Copper Corporation
Copper Flat Mine
NSR Minor Source Air Quality Permit Application Emissions Inventory

Allowable Facility Emission Rates

		NOx		CO		SO2		VOC		TSP		PM10		PM2.5	
Unit ID	Unit Description	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
S1	Drilling – Open Pit									5.4	19	2.8	9.9	0.57	2.0
S2	Blasting – Open Pit		54		214		6.4			54	2.3	28	1.2	1.6	0.068
S3	Prill Silo Loading									0.88	0.064	0.42	0.030	0.063	0.0046
S4	Truck Loading - Open Pit									10	44	4.7	21	0.72	3.1
S5	Bulldozer – Open Pit									21	41	4.5	8.9	2.2	4.3
S6	Raw Ore Unloading to Surge Bin									1.5	6.7	0.72	3.2	0.11	0.48
S7	Drop from Surge Bin to Apron Feeder														
S8	Primary Crusher									1.0	4.5	1.0	4.5	1.0	4.5
S9	Primary Crusher Apron Conveyor TP														
S10	Stacker Conveyor Drop to Course Ore Storage Pile									1.5	6.7	0.72	3.2	0.11	0.48
S11	Bulldozer Maintenance of Course Ore Storage Pile									15	21	3.1	4.5	1.5	2.2
S12	Course Ore Storage Pile Drop to Reclaimer									1.0	4.5	1.0	4.5	1.0	4.5
S13	Reclaimer Drop to Reclaim Conveyor														
S14	Reclaim Conveyor Drop to Wet Mill									0.23	1.0	0.11	0.47	0.016	0.072
S15	Lime Silo Loading									0.043	0.0094	0.043	0.0094	0.043	0.0094
S16	Drop to Molybdenum Storage Pile														
S17	Drop to Molybdenum Bagger									1.0	4.5	1.0	4.5	1.0	4.5
S19	Product Loading Trucks Molybdenum														
S18	Drop to Copper Concentrate Storage Pile									0.0017	0.0072	0.00078	0.0034	0.00012	0.00052
S20	Product Loading Trucks Copper Concentrate									0.0033	0.014	0.0016	0.0069	0.00024	0.0010
S21	Truck Unloading Low Grade Ore Stockpile									0.18	0.78	0.084	0.37	0.013	0.056
S22	Bulldozer Low Grade Ore Stockpile Area									21	20	4.5	4.3	2.2	2.1
S23	Truck Unloading Waste Dump Stockpile									3.8	17	1.8	7.8	0.27	1.2
S24	Bulldozer Waste Dump Stockpile Area									21	30	4.5	6.5	2.2	3.2
S25	Bulldozer Tailings Dam Area									2.9	4.2	0.54	0.78	0.30	0.44
S26	Scraper Loading Tailings Area									1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading Tailings Area									0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel Mode									3.3	12	1.1	4.0	0.11	0.40
S29	Truck Traffic Mine Trucks/Light Vehicles									87	319	25	91	2.5	9.1
S30	Truck Traffic Product/Chemical Delivery Trucks									3.7	13	0.95	3.5	0.095	0.35
S31	Grader – Road Maintenance									11	28	3.8	9.6	0.35	0.87
S32	Wind Erosion Course Ore Pile									0.25	1.1	0.12	0.54	0.018	0.081
S33	Wind Erosion Open Pit Area									3.2	14	1.6	7.0	0.24	1.0
S34	Wind Erosion Low Grade Ore Stockpile Area									1.3	5.6	0.64	2.8	0.10	0.42
S35	Wind Erosion Waste Dump Stockpile Area									3.9	17	2.0	8.6	0.30	1.3
S36	Wind Erosion Tailings Area									3.3	14	1.6	7.2	0.25	1.1
	Allowable Facility Totals		**54**		**214**		**6.4**			**279**	**657**	**97**	**222**	**19**	**48**

Some materials and process lines are exposed and lose moisture rapidly. Measuring moisture content at a given point in the process line will not accurately reflect the control efficiency of the wet suppression. In these cases, refer to the following table.

Material Handling Table 5 -- Control Techniques		
Control Technique	Control Efficiency (%)	Discussion
Water Spray (Application Point)	75	
Chemical Additive (Application Point)	85	
Water Spray (Downstream Effect)	75-(5*n)	n = number of transfer points from initial application
Chemical Additive (Downstream Effect)	85-(5*n)	
Conveyor with Half Cover	50	Covers less than 60 percent of conveyor
Conveyor with Three Quarter Cover	70	Covers less than 85 percent of conveyor
Conveyor with Full Cover	85	Completely covers conveyor width
Baghouse with Multiple Pickups	95	Baghouse must meet minimum flow standard given in Table 6
Baghouse with Single Pickup (Unenclosed)	97	
Baghouse with Single Pickup (Partial Enclosure)	98	
Baghouse with Single Pickup (Full Enclosure)	99	
Baghouse with Single Pickup (Attached)	99.5	

Material Handling Table 6 -- Required Baghouse Flow Ratios (in cfm/sq ft)																			
	Type of Material																		
Type of Baghouse/ Filter Cloth	Alumina	Bauxite	Carbon Black	Cement	Clay	Feldspar	Fly Ash	Graphite	Gypsum	Iron Oxide	lead Oxide	Lime	Limestone	Quartz	Rock Dust	Sand	Silica	Slate	Talc
Shaker/Woven or Reverse Air/Woven	2.5	2.5	1.5	2.0	2.5	2.2	2.5	2.0	2.0	2.5	2.0	2.5	2.7	2.8	3.0	2.5	2.5	3.5	2.5
Pulse Jet/Felt or Reverse Air/Felt	8	8	5	8	9	9	8	8	10	7	6	10	8	8	9	10	7	12	10

Note that higher baghouse control efficiencies can be justified with source tests, permit conditions and/or design factors.

Particulate emissions can also be reduced through the use of wind screens or enclosures (on a relatively small scale). The District assumes that complete coverage by wind screens (on the windward side) will provide a control efficiency of 75 percent.

Once the control efficiency of the applicable control technique is known, the following equation is used to determine the "controlled" emissions from the operation or process:

$$E_c = E \times \left(\frac{100 - C}{100} \right)$$

E_c = Controlled emissions
E = Uncontrolled emissions
C = Control efficiency in percent (%)

3.3.3 Surface Treatments

3.3.3.1 Watering. The control efficiency of unpaved road watering depends upon (a) the amount of water applied per unit area of road surface, (b) the time between reapplications, (c) traffic volume during that period, and (d) prevailing meteorological conditions during the period. While several investigations have estimated or studied watering efficiencies, few have specified all the factors listed above.

An empirical model for the performance of watering as a control technique has been developed.[8] The supporting data base consists of 14 tests performed in four states during five different summer and fall months. The model is:

$$C = 100 - \frac{0.8\ p\ d\ t}{i} \qquad (3\text{-}2)$$

where: C = average control efficiency, percent

P = potential average hourly daytime evaporation rate, mm/h

d = average hourly daytime traffic rate, (h^{-1})

i = application intensity, L/m^2

t = time between applications, h

Estimates of the potential average hourly daytime evaporation rate may be obtained from

$$p = \begin{cases} 0.0049 \times \text{(value in Figure 3-2) for annual conditions} \\ 0.0065 \times \text{(value in Figure 3-2) for summer conditions} \end{cases}$$

An alternative approach (which is potentially suitable for a regulatory format) is shown as Figure 3-3. This figure is adapted from 11 field tests conducted at a coal-fired power plant. Measured control efficiencies did not correlate well with either time or vehicle passes after application. However, this is believed due to reduced evening evaporation (logistics delayed the start of testing until 3 p.m. and testing continued through the early evening). Surface moisture grab samples were taken throughout the testing period, and not surprisingly, these show a strong correlation with control efficiency.

Figure 3-3 shows that between the average uncontrolled moisture content and a value of twice that, a small increase in moisture content results in a large increase in control efficiency. Beyond this point, control efficiency grows slowly with increased moisture content. Although

Maximizing the Value of Flotation Chemicals Technology

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**Flottec PAX Collector**
SYNONYMS:	Potassium Amyl Xanthate, Potassium Isoamyl Xanthate
CHEMICAL FAMILY:	Alkyl xanthate salt
MOLECULAR FORMULA:	C6H12OS2K
MOLECULAR WEIGHT	203.4
MANUFACTURER:	Flottec, LLC • 338 West Main Street • Boonton, New Jersey 07005 • USA
PRODUCT INFORMATION:	Tel: +1.973.588.4717 • Fax: +1.973.588.4719 • Web Site: www.flottec.com
EMERGENCY PHONE:	CHEMTREC • North America: +1.800.424.9300 • International: +1.703.527.3887
ISSUE DATE:	November 1, 2009

2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

COMPONENT	CAS No.	% (w/w)	OSHA (PEL)	ACGIH (TLV)	Carcinogen
Potassium sulfide	1312-73-8	~ 1	Not established	Not established	-
Carbonodithioic acid, O-(3-methylbutyl) ester, potassium salt	1928-70-1	> 90	Not established	Not established	-
Potassium hydroxide	1310-58-3	0 - 1	2 mg/m³ (Ceiling)	2 mg/m³ (Ceiling)	-

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR

Color: Yellow-green
Appearance: Pellets, flakes, or powder
Odor: Disagreeable

STATEMENT OF HAZARD

DANGER! **SELF-HEATING MATERIAL**
MAY BE SPONTANEOUSLY COMBUSTIBLE
MAY FORM EXPLOSIVE DUST-AIR MIXTURES
HARMFUL IF ABSORBED THROUGH SKIN
DUST IRRITATING
CAUSES EYE AND SKIN IRRITATION

POTENTIAL HEALTH EFFECTS

EFFECTS / ROUTES OF EXPOSURE

The acute oral (rat) LD50 and dermal (rabbit) LD50 values are estimated to be >1,000 mg/kg and >500 mg/kg, respectively. Skin or eye contact with solutions of this product may cause moderate skin and eye irritation. Airborne dust may cause significant eye, skin or respiratory tract irritation. Refer to Section 11 for toxicology information on the regulated components of this product.

4. FIRST AID MEASURES

INGESTION:	If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.
SKIN CONTACT:	Remove contaminated clothing and shoes without delay. Wash immediately with plenty of water. Do not reuse contaminated clothing without laundering. Get medical attention if pain or irritation persists after washing or if signs and symptoms of overexposure appear.
EYE CONTACT:	Rinse immediately with plenty of water for at least 15 minutes. Obtain medical attention immediately.
INHALATION:	Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms.

5. FIREFIGHTING MEASURES.

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Extinguishing Media:	Use carbon dioxide, dry chemical or large quantities of water.
Protective Equipment:	Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection).
Special Hazards:	Solid xanthates are stable when kept cool and dry. Exposure to heat and moisture can cause decomposition to flammable and explosive vapor of carbon disulfide. Since xanthates decompose in solution, even at room temperature, fire and explosion hazards can develop with aging.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:	Where exposure level is not known, wear approved, positive pressure, self-contained respirator. Where exposure level is known, wear approved respirator suitable for level of exposure. Refer to Section 8 (Exposure Controls/Personal Protection) for appropriate personal protective equipment.
METHODS FOR CLEAN UP:	Sweep up into containers for disposal. Flush spill area with water.
ENVIRONMENTAL PRECAUTIONS:	Dispose of in accordance with EPA rules and regulations.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures :	Avoid excessive heat or moisture. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Keep container closed. Wash thoroughly after handling. Use non-sparking tools and do not smoke when opening drum. Use with adequate ventilation. Contains finely divided material. Dust suspended in air may ignite with static discharge, sparks or flame. Equipment, including venting systems, should be grounded. Provide adequate ventilation in areas of use to remove dust. Wash contaminated clothing before reuse.
Special Handling Statements :	Minimize dust. Special precautions against fire and explosion must be observed in (1) pumping xanthate solutions, (2) draining mobile tanks, (3) cleaning mobile tanks, and (4) performing maintenance work on storage tanks and pipelines leading to and from tanks. Use non-sparking tools and do not smoke when opening drums of xanthate. DUST EXPLOSION HAZARD CLASS - 2 Handling of material should be in accordance with standards for venting of deflagrations (e.g. NFPA-68). If handled with flammable or combustible materials the explosion hazard may increase
STORAGE	Heating or overexposure to moisture of solid xanthates or heating or aging of xanthate solutions causes some decomposition to poisonous and flammable carbon disulfide. Storage tanks should have certain design features for maximum safety, and the vapor space should be free of sources of ignition.
Storage Temperature:	Store at <32.2 - 10 °C 90 - 50 °F **Reason:** Safety

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING MEASURES	Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION:	Where exposures are below the established exposure limit, no respiratory protection is required. Where exposures exceed the established exposure limit, use respiratory protection recommended for the material and level of exposure.
EYE PROTECTION:	Wear eye/face protection such as chemical splash proof goggles or face shield. Eyewash equipment and safety shower should be provided in areas of potential exposure.
SKIN PROTECTION:	Avoid skin contact. Wear impermeable gloves and suitable protective clothing.
ADDITIONAL ADVICE:	Food, beverage and tobacco products should not be carried, stored or consumed where this material is used. Before eating, drinking, or smoking, wash face and hands with soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

COLOR:	Yellow-green
APPEARANCE:	Pellets, flakes, or powder
ODOR:	Disagreeable
BOILING POINT:	Not applicable
MELTING POINT:	491 - 536°F; 255 - 280°C
VAPOR PRESSURE:	Not applicable
SPECIFIC GRAVITY:	Not available
VAPOR DENSITY:	Not applicable
% VOLATILE (BY WT.):	~ 1.5
pH:	Not applicable
SATURATION IN AIR (% by Vol):	Not applicable
EVAPORATION RATE:	Not applicable
SOLUBILITY IN WATER:	35 g/100 g at 20°C
VOLATILE ORGANIC CONTENT:	Not available
FLASH POINT:	Not applicable
FLAMMABLE LIMITS (% BY VOL.):	Not applicable
AUTO IGNITION TEMPERATURE:	>248°F; 120°C (value for carbon disulfide)
DECOMPOSITION TEMPERATURE:	>267.8 - 536°F; 131 - 280°C
PARTIAL COEFFICIENT (n-octanol/water):	Not available
ODOR THRESHOLD:	See Section 2 for exposure limits

10. STABILITY AND REACTIVITY

STABILITY:	Stable
CONDITIONS TO AVOID:	Containers filled with this product should be kept closed when not in use. Keep container in a cool, well-ventilated area. Exposure of the solid xanthate to heat or moisture and heating or aging of xanthate solutions. Avoid prolonged exposure to heat; avoid strong acids, alkalies and oxidizing agents. Keep water and moist air out of container.
POLYMERIZATION:	Will not occur
CONDITIONS TO AVOID:	None known
MATERIALS TO AVOID:	Strong oxidizing agents, acidic material. High temperatures
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon disulfide, carbon monoxide, carbon dioxide, oxides of sulfur (includes sulfur di and tri oxides), hydrogen sulfide

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under SECTION 3: HAZARDS IDENTIFICATION
Toxicological information on the regulated components of this product is as follows:

Potassium hydroxide has an acute oral (rat) LD50 value of 273 mg/kg. Acute overexposure to potassium hydroxide or dusts causes severe respiratory irritation. Potassium hydroxide is severely irritating to the eyes and skin.

Potassium sulfide may cause eye and skin irritation. Under acidic conditions, potassium sulfide can decompose to produce flammable poisonous hydrogen sulfide gas.

Potassium 3 methyl butyl xanthate has an estimated acute oral (rat) LD50 and acute dermal (rabbit) LD50 values of > 1,000 mg/kg and > 500 mg/kg, respectively, based on similar materials. Direct contact with this material may cause moderate eye and skin irritation. Airborne dust may cause significant eye, skin or respiratory tract irritation.

California Proposition 65 Warning (applicable in California only) - This product contains (a) chemical(s) known to the State of California to cause birth defects or other reproductive harm.

12. ECOLOGICAL INFORMATION

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
This material is not readily biodegradable.
All ecological information provided was conducted on a structurally similar product.

ALGAE TEST RESULTS

Test	Duration	Procedure	Species	Results	

FISH TEST RESULTS

Test	Duration	Procedure	Species	Results	
Acute toxicity, freshwater (OECD 203)	96 hr.	-	Rainbow Trout (Oncorhyncus mykiss)	> 10 – 100 mg/l	LC50

INVERTEBRATE TEST RESULTS

Test	Duration	Procedure	Species	Results	
Acute Immobilization (OECD 202)	48 hr.	-	Water Flea (Daphnia magna)	>1 - 10 mg/l	EC50

ACCUMULATION TEST RESULTS

Test	Duration	Procedure	Species	Results	

DEGRADATION

Test	Duration	Procedure	Results
Biodegradability	-	-	< 70 %
COMMENTS:	Information based on structurally similar material		

13. DISPOSAL CONSIDERATIONS

RECOMMENDATIONS FOR THE PRODUCT:	In accordance with regulations for special waste, product must be taken, after pretreatment, to an authorized special waste incineration plant.
RECOMMENDATIONS FOR PACKAGING:	Packaging that cannot be cleaned should be disposed of like the product.
RECOMMENDED CLEANSING AGENT:	Water

14. Transportation Information

This section provides basic shipping classification information.
Refer to appropriate transportation regulations for specific requirements.

U.S. DOT				
PROPER SHIPPING NAME:	XANTHATES			
HAZARD CLASS	4.2			
PACKING GROUP:	II			
UN/ID NUMBER:	UN3342			
TRANSPORT LABEL REQUIRED:	Spontaneously Combustible Marine Pollutant			
TECHNICAL NAME (N.O.S.):	Contains potassium amyl xanthate			
HAZARDOUS SUBSTANCE:	Not applicable			
COMMENTS:	Marine Pollutants - DOT requirements specific to Marine Pollutants do not apply to non-bulk packagings transported by motor vehicles, rail cars or aircraft.			
TRANSPORT CANADA				
PROPER SHIPPING NAME:	XANTHATES			
HAZARD CLASS	4.2			
PACKING GROUP:	II			
UN/ID NUMBER:	3342			
TRANSPORT LABEL REQUIRED:	Spontaneously Combustible Marine Pollutant			
TECHNICAL NAME (N.O.S.):	Contains potassium amyl xanthate			
ICAO/IATA				
PROPER SHIPPING NAME:	XANTHATES			
HAZARD CLASS:	4.2			
PACKING GROUP:	II			
UN NUMBER:	3342			
TRANSPORT LABEL REQUIRED:	Spontaneously Combustible			
PACKING INSTRUCTIONS/ MAXIMUM NET QUANTITY:	PASSENGER AIRCRAFT	415	15 kg	
	CARGO AIRCRAFT	417	50 kg	
TECHNICAL NAME (N.O.S.):	Contains potassium amyl xanthate			
IMO				
PROPER SHIPPING NAME:	XANTHATES			
HAZARD CLASS:	4.2			
UN NUMBER:	3342			
PACKING GROUP:	II			
TRANSPORT LABEL REQUIRED:	Spontaneously Combustible Marine Pollutant			
TECHNICAL NAME (N.O.S.):	Contains potassium amyl xanthate			

15. REGULATORY INFORMATION

INVENTORY INFORMATION

United States (USA)	All components of this product are included on the TSCA Chemical Inventory or are not required to be listed on the TSCA Chemical Inventory.
Canada	This product contains components not on the Domestic Substances List. These components are on the Non-Domestic Substances List.
European Union (EU)	All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC and its amendments.
Australia	All components of this product are included in the Australian Inventory of Chemical Substances (AICS) or are not required to be listed on AICS.
China	All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.
Japan	All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.
Korea	All components of this product are NOT included on the Korean (ECL) inventory.
Philippines	All components of this product are NOT included on the Philippine (PICCS) inventory.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

Component	CAS NO.	% (w/w)	TPQ (lbs)	RQ (lbs)	S313	TSCA 12B
Carbon disulfide	75-15-0	~ 0.001	10,000	100	YES	YES

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA

ACUTE (Y)	CHRONIC (N)	FIRE (Y)	REACTIVE (Y)	PRESSURE (N)

16. OTHER INFORMATION

NFPA HAZARD RATING
(National Fire Protection Association)

HEALTH - 2 -	Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.
FIRE - 1 -	Materials that must be preheated before ignition can occur.
REACTIVITY - 1 -	Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures.

REASON FOR REVISION: New format; Revised all sections

Prepared By: F. Cappuccitti **Revised By:** R. Nix

IMPORTANT: The above information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warrant, expressed or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular uses.

Maximizing the Value of Flotation Chemicals Technology

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**Flottec 2041 Collector**
SYNONYMS:	None
CHEMICAL FAMILY:	Phoshorordithioate salt
MOLECULAR FORMULA:	Mixture
MOLECULAR WEIGHT	Mixture
MANUFACTURER:	Flottec, LLC • 338 West Main Street • Boonton, New Jersey 07005 • USA
PRODUCT INFORMATION:	Tel: +1.973.588.4717 • Fax: +1.973.588.4719 • Web Site: www.flottec.com
EMERGENCY PHONE:	CHEMTREC • North America: +1.800.424.9300 • International: +1.703.527.3887
ISSUE DATE:	November 1, 2009

2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

COMPONENT	CAS No.	% (w/w)	OSHA (PEL)	ACGIH (TLV)	Carcinogen
Sodium hydroxide	1310-73-2	0.5 – 1.0	2 mg/m^3 (ceiling)	-	-
Water	7732-18-5	~ 50.0	Not established	-	-
Sodium di sec butyl-dithiophosphate	33619-92-0	35.0 – 50.0	Not established	-	-

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR

Color: Yellow-brown
Appearance: Liquid
Odor: Slight sulfur odor, alcohol

STATEMENT OF HAZARD

DANGER! CAUSES EYE BURNS AND SKIN IRRITATION

POTENTIAL HEALTH EFFECTS

EFFECTS / ROUTES OF EXPOSURE

The acute oral (rat) LD50 and dermal (rabbit) LD50 values are 4,060 mg/kg and 5,000 mg/kg, respectively. Marked irritation and skin corrosion were produced during primary irritation studies with rabbits. Contact with acid may cause liberation of hydrogen sulfide. Hydrogen sulfide has a strong rotten-egg odor, however, some people are unable to smell the gas and exposure will deaden the sense of smell. Therefore, odor is an unreliable indicator of exposure. Repeated or prolonged dermal contact with this material may cause severe allergic skin reactions. Such allergic reactions may be incapacitating for an extended period of time. Overexposure to hydrogen sulfide gas may cause severe eye or respiratory tract irritation, rapid development of coma and respiratory failure. Low levels of hydrogen sulfide may cause headache, dizziness, staggering gait, neurological damage and gastritis. Refer to Section 11 for toxicology information on the regulated components of this product.

4. FIRST AID MEASURES

INGESTION:	If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.
SKIN CONTACT:	Take off immediately all contaminated clothing. Wear impermeable gloves. Wash immediately with plenty of water and soap. Pay particular attention to skin crevices, nail folds, etc. Do not reuse contaminated clothing without laundering. Do not reuse contaminated leatherwear.
EYE CONTACT:	In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Obtain medical attention without delay.
INHALATION:	Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms.

5. FIREFIGHTING MEASURES.

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Extinguishing Media:	Use water spray or fog, carbon dioxide or dry chemical to extinguish fires
Protective Equipment:	Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection).
Special Hazards:	Sulfur dioxide or hydrogen sulfide may be formed under fire conditions. Do not flush to sewer which may contain acid. This could result in generation of toxic and explosive hydrogen sulfide gas.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:	Where exposure level is not known, wear approved, positive pressure, self-contained respirator. Where exposure level is known, wear approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8, wear impervious boots and rain suit.
METHODS FOR CLEAN UP:	Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.
ENVIRONMENTAL PRECAUTIONS:	Dispose of in accordance with EPA rules and regulations.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures :	Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.
Special Handling Statements :	This product should not be mixed with acids since evolution of toxic and explosive hydrogen sulfide gas could result. This precaution does not, of course, apply to addition of this reagent to flotation pulps in amounts customarily used in flotation.
STORAGE	None
Storage Temperature:	**Reason:**

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING MEASURES	Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION:	Where exposures are below the established exposure limit, no respiratory protection is required. Where exposures exceed the established exposure limit, use respiratory protection recommended for the material and level of exposure.
EYE PROTECTION:	Wear eye/face protection such as chemical splash proof goggles or face shield. Eyewash equipment and safety shower should be provided in areas of potential exposure.
SKIN PROTECTION:	Avoid skin contact. Wear impermeable gloves and suitable protective clothing.
ADDITIONAL ADVICE:	Food, beverage and tobacco products should not be carried, stored or consumed where this material is used. Before eating, drinking, or smoking, wash face and hands with soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

COLOR:	Amber to dark brown
APPEARANCE:	Liquid
ODOR:	Slight sulfur, alcohol
BOILING POINT:	Not Available
MELTING POINT:	Not applicable
VAPOR PRESSURE:	Similar to water at 25°C
SPECIFIC GRAVITY:	1.126 at 25°C
VAPOR DENSITY:	Similar to water
% VOLATILE (BY WT.):	<50 (water)
pH:	>11 (minimum)
SATURATION IN AIR (% by Vol):	Similar to water
EVAPORATION RATE:	Similar to water
SOLUBILITY IN WATER:	Complete
VOLATILE ORGANIC CONTENT:	Not available
FLASH POINT:	>200°F; 93°C, Setaflash Closed Cup
FLAMMABLE LIMITS (% BY VOL.):	Not available
AUTO IGNITION TEMPERATURE:	Not available
DECOMPOSITION TEMPERATURE:	Not available
PARTIAL COEFFICIENT (n-octanol/water):	Not available
ODOR THRESHOLD:	See Section 2 for exposure limits

10. STABILITY AND REACTIVITY

STABILITY:	Stable
CONDITIONS TO AVOID:	None known
POLYMERIZATION:	Will not occur
CONDITIONS TO AVOID:	None known
MATERIALS TO AVOID:	This product contains a neutralized dithio acid. Avoid contact with strong oxidizing agents and mineral acids.
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon dioxide, carbon monoxide; oxides of sulfur (includes sulfur di and tri oxides), oxides of phosphorus, hydrogen sulfide

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under SECTION 3: HAZARDS IDENTIFICATION
Toxicological information on the regulated components of this product is as follows:

Acute overexposure to sodium hydroxide mists or dusts causes severe respiratory irritation. A solution of sodium hydroxide can produce irreversible damage to eyes and skin.

Sodium di sec butyl dithiophosphate has estimated acute oral (rat) and dermal (rabbit) LD50 values of greater than 5000 mg/kg and 2000 mg/kg, respectively. Direct contact with sodium di sec butyl dithiophosphate can cause eye burns and skin corrosion.

12. ECOLOGICAL INFORMATION

The ecological assessment for this material is based on an evaluation of its components.
This material is not readily biodegradable
This material is not classified as dangerous for the environment.

ALGAE TEST RESULTS

Test	Duration	Procedure	Species	Results	

FISH TEST RESULTS

Test	Duration	Procedure	Species	Results	
Acute toxicity, freshwater (OECD 203)	96 hr.		Rainbow Trout (Oncorhyncus mykiss)	1149 mg/l	LC50
Acute toxicity, freshwater (OECD 203)	96 hr.		Chinook Salmon (Oncorhyncus tshawytscha)	152 mg/l	LC50

INVERTEBRATE TEST RESULTS

Test	Duration	Procedure	Species	Results	

ACCUMULATION TEST RESULTS

Test	Duration	Procedure	Species	Results	

DEGRADATION

Test	Duration	Procedure	Results
Closed Bottle (OECD 301D)	28 day	Ready biodegradability	20.4 %
COMMENTS:			

13. DISPOSAL CONSIDERATIONS

RECOMMENDATIONS FOR THE PRODUCT:	In accordance with regulations for special waste, product must be taken, after pretreatment, to an authorized special waste incineration plant.
RECOMMENDATIONS FOR PACKAGING:	Packaging that cannot be cleaned should be disposed of like the product.
RECOMMENDED CLEANSING AGENT:	Water

14. Transportation Information

This section provides basic shipping classification information.
Refer to appropriate transportation regulations for specific requirements.

U.S. DOT				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS	8			
PACKING GROUP:	II			
UN/ID NUMBER:	UN1719			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			
HAZARDOUS SUBSTANCE:	Not applicable			
COMMENTS:	-			
TRANSPORT CANADA				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS	8			
PACKING GROUP:	II			
UN/ID NUMBER:	1719			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			
ICAO/IATA				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS:	8			
PACKING GROUP:	II			
UN NUMBER:	1719			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
PACKING INSTRUCTIONS/ MAXIMUM NET QUANTITY:	PASSENGER AIRCRAFT	809	1L	
	CARGO AIRCRAFT	813	30L	
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			
IMO				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS:	8			
UN NUMBER:	1719			
PACKING GROUP:	II			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			

15. REGULATORY INFORMATION

INVENTORY INFORMATION

United States (USA)	This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C. 2601 et. seq.
Canada	Components of this product have been reported to Environment Canada in accordance with Sections 66 and/or 81 of the Canadian Environmental Protection Act (1999), and are included on the Domestic Substance List.
European Union (EU)	All Components o this product are included in the European Inventory of Existing Chemical Substance (EINECS) in compliance with Council Directive 67/548/EEC and its amendments.
Australia	All components of this product are included in the Australian Inventory of Chemical Substances (AICS)
China	All components of his product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.
Japan	All components of his product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.
Korea	All components of his product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.
Philippines	All components of this product are NOT included on the Philippine (PICCS) inventory.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

Component	CAS NO.	% (w/w)	TPQ (lbs)	RQ (lbs)	S313	TSCA 12B
This product does not contain any components regulated under these sections of the EPA						

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA

ACUTE (Y)	CHRONIC (N)	FIRE (N)	REACTIVE (N)	PRESSURE (N)

16. OTHER INFORMATION

NFPA HAZARD RATING
(National Fire Protection Association)

HEALTH - 3 -	Materials that, under emergency conditions, can cause serious or permanent injury.
FIRE - 1 -	Materials that must be preheated before ignition can occur.
REACTIVITY - 0 -	Materials which in themselves are normally stable, even under fire exposure conditions.

REASON FOR REVISION: New format; Revised all sections

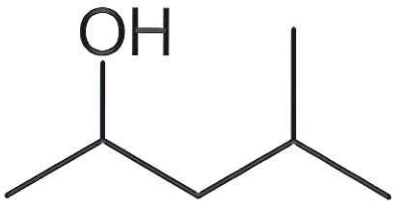
Prepared By: F. Cappuccitti **Revised By:** R. Nix

IMPORTANT: The above information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warrant, expressed or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular uses.

Haltermann
A Division of Monument Chemical

Johann Haltermann, Ltd.
16717 Jacintoport Blvd.
Houston, TX 77015-6544
Phone: 281-452-5951
Fax: 281-457-1128

Product Safety Bulletin



Methyl Isobutyl Carbinol (MIBC)

PRODUCT OVERVIEW

Methyl Isobutyl Carbinol (MIBC) is a clear, colorless liquid.

MIBC exposure is possible in both industrial and consumer applications. Occupational exposure limits have been established to control the allowable amount of exposure in workplace settings.

Consumer exposure, generally infrequent and short in duration, is also highly dependent upon the conditions under which MIBC is used. See Health Information.

MIBC does not cause adverse health or environmental effects at levels typically found in the workplace or in the environment.

OTHER NAMES

CAS 108-11-2
4-Methylpentan-2-ol
Methyl amyl alcohol
1,3-Dimethylbutanol
2-Pentanol, 4-methyl-
4-Methyl-2-pentyl alcohol
Isobutylmethylmethanol

MIBC
Isobutyl methyl carbinol
EINECS No: 203-551-7
2-Methyl-4-pentanol
4-Methyl-2-amyl alcohol
Isobutylmethylcarbinol
Methyl amyl alcohol

TYPICAL PROPERTIES

Molecular Weight	$C_6H_{14}O$
Empirical Formula	102.2 g/mol
Appearance	Colorless Liquid
Boiling Point @ 760mm Hg	Boiling Point: 131.7°C (269.1°F)
Freezing Point	Freezing Point: -90°C (-130°F)
Flash Point – Closed Cup	Flash Point: 40.5°C (105°F)
Autoignition Temperature	305°C
Density @ 20°C	0.81 g/cm^3
Vapor Pressure @ 20°C	0.42 kPa
Evaporation Rate (n-butyl acetate = 1) (ether = 1)	 0.28 66
Solubility @ 20°C (in water) (water in)	 1.6% m/m 6.3% m/m
Surface Tension @ 20°C	23 mN/m
Refractive Index @ 20°C	1.410
Viscosity @ 20°C	5.2 mPa·s
Lower Explosive Limit	1.0 v/v/%
Upper Explosive Limit	5.5 v/v%
Conductivity @ 20°C	0.3 µS/m
Dielectric Constant @ 20°C	10.4
Specific Heat @ 20°C	2.4 kJ/kg/°C
Heat of Vaporization @ Tboil	413 kJ/kg
Heat of Combustion (net) @ 25°C	36000 kJ/kg
Odor Threshold	1.1 ppm

Note: The properties reported above are typical physical properties. Haltermann in no way guarantees that the product from any particular lot will conform exactly to the given values.

PRODUCT USES

MIBC is primarily used (~70%) in the production of lube oil additives and for antiwear and corrosion inhibitors.

The second largest use of MIBC (~20%) is as a flotation frother for treating copper ores, coal and tar sand mining. In mining frother applications, MIBC is used in the ppm range, with usual concentrations less than 1000 ppm and in many cases in the hundreds of ppm range (100 - 600 ppm).

The remaining production is primarily for its use as an additive to surface coatings as a solvent to maintain binder softness until the binder fuses.

HEALTH INFORMATION

Anesthetic effects can be expected at high vapor concentrations. Vapor concentrations of 50 ppm for 15 minutes are irritating to the eyes, nose and throat. The ACGIH TLV-TWA for MIBC is 25 ppm (104 mg/m^3) and the TLV-STEL is 40 ppm (167 mg/m^3). The 4-hour LC_{50} for MIBC was > 16 mg/L (3776 ppm).

MIBC has minimal acute toxicity by oral and dermal routes of exposure. The acute oral and dermal LD_{50} values for MIBC are 2260 - 2970 $^{mg}/_{kg}$ and 2870 $^{mg}/_{kg}$, respectively.

There are no known sensitization or cancer hazards.

POTENTIAL FOR EXPOSURE

There is a potential for occupational and consumer exposure through inhalation and skin contact although exposures through inhalation are expected to be low due to the low vapor pressure.

Based on the uses for MIBC the public could be exposed through:

- **Workplace exposure** – With the exception of the use in tar sand mining, frothers are used in closed systems and only catastrophic failure results in any appreciable exposure. In tar sand mining, the MIBC is added to the tar sand and the sand is spread out and allowed to dry. The majority of MIBC from this use is volatilized to the air. Exposure (in the ppm range) is typically limited to the equipment operator pushing the sand. MIBC used as an intermediate in the manufacture of lube oil additives is blended with other alcohols and reacted. Normally these reactors are closed systems and exposure is limited to upsets or catastrophic failure of the reactor.

- **Consumer use of products containing MIBC** –Minimal exposure to vapors from the use of MIBC as a solvent in coating applications may also occur. Overall, consumer exposure to MIBC is expected to be negligible.

- **Environmental releases** – MIBC can enter the environment as emissions from its manufacture and use as a frother. 94% is biodegraded within 20 days.

  Chemical manufacturers are committed to operating in an environmentally responsible manner everywhere business is done. Efforts are guided by in-depth scientific understanding of the environmental impact of operations, as well as the social and economic needs of the communities. Industrial spills or releases are rare; however a spill may pose a significant flammability issue.

REGULATORY STATUS

Refer to the JHL Material Safety Data sheet for more specific information.

MIBC is not subject to the reporting requirement of CERCLA.

MIBC is not SARA Section 313 chemical.

MIBC is on the U.S. TSCA list and is included in the EEC's EINECS, Canadian DSL, Australian and Japanese chemical inventories.

STORAGE AND HANDLING

General industry practice is to store MIBC in carbon steel vessels.

MIBC should be stored only in tightly closed, properly vented containers away from heat, sparks, open flame or strong oxidizing agents.

Provided proper storage and handling precautions are taken, expect MIBC to be technically stable for at least 12 months.

Handle empty containers carefully. Combustible residue remains after emptying.

Undue exposure or spillage should be strictly avoided as a matter of good practice. Refer to the Material Safety Data Sheet for more specific information.

ADDITIONAL INFORMATION

Johann Haltermann Ltd. MIBC MSDS
OECD SIDS Assessment for MIBC

The information in this Product Safety Bulletin is made without warranty. Johann Haltermann, Ltd. disclaims any liability in connection with the use of this information, and does not warranty against infringement by reason of the use of any of its products in combination with other materials in any process.

Material Safety Data Sheet

Accepta 2081

Date issued: 01-06-2004

1. IDENTIFICATION OF THE PREPARATION AND OF THE COMPANY

Product Name:	ACCEPTA 2081
Application:	Flocculant water treatment
Company Identification:	Accepta Ltd. Quay West Trafford Wharf Road Manchester M17 1HH United Kingdom
Office telephone number:	+44 (0) 161 240 2100
Office fax number:	+44 (0) 870 135 6389
Emergency Telephone Number:	+44 (0) 161 240 2100

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL DESCRIPTION:
Water, Polymer, Inorganic salt(s).

HAZARDOUS INGREDIENTS:

CAS NO.	EINECS NO.	CHEMICAL NAME	WT %	SYMBOL	R-PHRASES

This product is not classified as hazardous (European Directive 88/379/EEC, 1999/45/EC)

3. HAZARD IDENTIFICATION

HUMAN HEALTH HAZARDS - ACUTE:
INHALATION:
May cause irritation of mucous membranes.
SKIN CONTACT:
Can cause mild irritation.
EYE CONTACT:
Can cause moderate irritation.
INGESTION:
There may be irritation to the gastro-intestinal tract with nausea and vomiting.
PHYSICAL AND CHEMICAL HAZARDS:
Can react violently with alkalis and oxidising agents.

accepta

Material Safety Data Sheet

Accepta 2081

Date issued: 01-06-2004

4. FIRST AID MEASURES

INHALATION: Remove to fresh air, rest, treat symptomatically. Obtain medical attention.

SKIN CONTACT: Remove contaminated clothing. Wash off affected area immediately with plenty of water. If skin irritation persists, obtain medical attention.

EYE CONTACT: Immediately gently irrigate with clean water for at least 15 minutes. Move eyeball and keep eyelids wide open and apart whilst irrigating. Obtain medical attention.

INGESTION: Do not induce vomiting without medical advice. If conscious wash out mouth and give 500ml of water to drink. Obtain medical attention.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA:
Not expected to burn. Use extinguishing media appropriate for surrounding fire.
FIRE AND EXPLOSION HAZARD
Oxides of nitrogen, Oxides of sulphur, Oxides of carbon, Hydrogen chloride, Ammonia (under fire conditions).
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING:
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit. Water mist may be used to cool closed containers.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Use personal protective equipment recommended in Section 8.
Spill may be slippery.

ENVIRONMENTAL PRECAUTIONS:
Do not allow to enter sewers or water courses. If spillage does enter sewers or water courses, immediately inform the appropriate water authorities

METHODS FOR CLEANING UP:
Contain and absorb with sand or vermiculite and mix well. Collect up and remove to a safe place until disposal. Wash site of spillage thoroughly with water. Assistance can be obtained from waste disposal companies. Use of alkaline absorbent materials will generate ammonia. Do not mix with any bleaches or oxidising agents.

acc@pta

Material Safety Data Sheet

Accepta 2081

Date issued: 01-06-2004

7. HANDLING AND STORAGE

HANDLING:
Avoid contact with skin and eyes. Use with adequate ventilation. Avoid generating aerosols and mists

STORAGE CONDITIONS:
Protect from freezing. Keep container tightly closed. Storage for more than 6 months is not recommended. Avoid temperatures greater than >40 °C. Store away from direct sunlight. It is recommended to store the product inside during all four seasons.

CONSTRUCTION MATERIAL COMPATIBILITY. Compatible with:
PVC, polypropylene, polyurethane, polyethylene, hypalon, buna-N, teflon, viton, vinyl, fibre glass 411, Plasite 4005, 6000 and 7122, neoprene.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS
None
ENGINEERING MEASURES
Not normally needed. Local exhaust ventilation is recommended where significant mists, vapours or aerosols are generated.
RESPIRATORY PROTECTION:
Respiratory protection not normally needed. If significant mists, vapours or aerosols are generated an approved respirator is recommended, filter-type A.
HAND PROTECTION:
PVC gloves. Nitrile gloves. Most glove materials are of low chemical resistance. Replace gloves regularly.
SKIN PROTECTION:
Standard protective clothing.
EYE PROTECTION:
Chemical splash goggles.
HYGIENE RECOMMENDATIONS:
Keep an eye wash fountain available. Keep a safety shower available. Wash hands at breaks and at the end of the shift. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

NOTE: These physical properties are typical values for this product
FORM: Liquid
COLOUR: White - Opaque
ODOUR: None
VALUE UNIT TEST METHOD
BOILING POINT: 120 °C
FLASH POINT: NA
RELATIVE DENSITY: 1.21-1.23 (20 °C)
SOLUBILITY IN WATER: Complete
pH (25 °C) 3.0-4.2
VISCOSITY (25 °C) <700 cps
FREEZING POINT: -10 °C
FREEZE- THAW RECOVERY: Complete
Abbreviation: NE = not evaluated, NA = not applicable, NR = not relevant

accepta

Material Safety Data Sheet

Accepta 2081

Date issued: 01-06-2004

10. STABILITY AND REACTIVITY

STABILITY:
Stable under ambient conditions.
CONDITIONS TO AVOID:
Extremes of temperature: <-10 °C and > 40 °C.
MATERIALS TO AVOID:
Can react violently with alkalis and oxidising agents.
HAZARDOUS DECOMPOSITION PRODUCTS:
Oxides of nitrogen, Oxides of sulphur, Oxides of carbon, Hydrogen chloride, Ammonia (under fire conditions).

11. TOXICOLOGICAL INFORMATION

Please refer to section 3 for hazards identification.
ACUTE TOXICITY DATA:
ACUTE LETHALITY VALUES:
Oral (mouse) LD_{50} = 7500 mg/kg
PRIMARY (DRAIZE TEST) SKIN/EYE
Primary skin irritation: No

12. ECOLOGICAL INFORMATION

PERSISTENCY AND DEGRADATION:
Biological Oxygen Demand (BOD_5): 9700 mg/l
Chemical Oxygen Demand (COD): 130000 mg/l
TOC: 65000 mg/l
The product is not expected to be readily biodegradable.
MOBILITY AND BIOACCUMULATION POTENTIAL:
No bioaccumulation expected
ADDITIONAL ECOLOGICAL DATA:
AOX information: Product contains no organic halogens

accepta

Material Safety Data Sheet

Accepta 2081

Date issued: 01-06-2004

13. DISPOSAL CONSIDERATIONS

Via authorized contractor. If this product becomes a waste, the final user must define and assign the
appropriate European Waste Catalogue code.
NATIONAL REGULATIONS UK
In accordance with the Environmental Protection (Duty of Care) Regulations 1991.

14. TRANSPORT INFORMATION

Class: Not regulated

15. REGULATORY INFORMATION

CLASSIFICATION:
HAZARD SYMBOL: Not applicable
Contains: --
RISK PHRASES:
This product is not classified as hazardous (European Directive 88/379/EEC, 1999/45/EC)
SAFETY PHRASES:
S24/25 Avoid contact with skin and eyes. S26 In case of contact with eyes, rinse immediately with plenty of
water and seek medical advice. S28 After contact with skin, wash immediately with plenty of water.
S36/37/39
Wear suitable protective clothing, gloves and eye/face protection.
Safety data sheet available for professional user on request.
NATIONAL REGULATIONS GERMANY
VbF-Klasse: None
WHG-WGK: 2 Classification according VwVwS v. 17.05.99, Anhang 4
StörfallVO: /12.BImSchV.Liste d. Anh. II): -
TA-Luft: -
Hinweise zur Beschäftigungsbeschränkung: None
NATIONAL REGULATIONS UK
COSHH regulations apply.
NATIONAL REGULATIONS SWITZERLAND
BAGT-Nr: 616200
Toxic class: frei

accepta

Material Safety Data Sheet

Accepta 2081

Date issued: 01-06-2004

16. OTHER INFORMATION

Emergency Telephone Number +44 (0) 161 240 2100

Health	2
Fire	3
Reactivity	2
Personal Protection	E

Material Safety Data Sheet
Sodium hydrosulfite MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium hydrosulfite

Catalog Codes: SLS3463, SLS1246

CAS#: 7775-14-6

RTECS: JP2100000

TSCA: TSCA 8(b) inventory: Sodium hydrosulfite

CI#: Not applicable.

Synonym: Blankit; Burmol; Hydros; Hydrosulfite R Conc; V-Brite B; Vatrolite; Sodium Dithionite; Sodium Hyposulfite; Disodium dithionite; Disodium hydrosulfite

Chemical Name: Dithionous acid, disodium salt

Chemical Formula: Na2S2O4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium hydrosulfite	7775-14-6	100

Toxicological Data on Ingredients: Sodium hydrosulfite: ORAL (LD50): Acute: >500 mg/kg [Rat]. DERMAL (LD50): Acute: >10000 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion. Slightly hazardous in case of skin contact (irritant), of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of moisture. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid. Spontaneously combustible material. Do not use water or foam. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use DRY chemical powder. Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Burns slowly, about like sulfur. Heats spontaneously in contact with moisture and air. May ignite nearby combustible materials. Vigourously supports combustion. Sodium Dithionite + Sodium Chlorite causes ignition of the latter. Reacts on exposure to moist air form toxic and corrosive fumes with the generation of heat and risk of combustion.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:

Spontaneously combustible solid. Oxidizing material. Stop leak if without risk. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray curtain to divert vapor drift. Cover with dry earth, sand or other non-combustible material. Prevent entry into sewers, basements or confined areas. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Keep away from direct sunlight or strong incandescent light. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes. Avoid shock and friction. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage:
Store in a segregated and approved area. Keep in a cool and ventilated area away from combustible materials. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Separate from acids, alkalies, reducing agents and combustibles. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Solid powder.)

Odor: Characteristic. Sulfurous. (Slight.)

Taste: Not available.

Molecular Weight: 174.11 g/mole

Color: White. Grayish white.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Decomposition temperature: 20°C (68°F)

Critical Temperature: Not available.

Specific Gravity: 0.8 - 1.02(Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Soluble in cold water. Slightly soluble in alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat (above 50 deg. C) moisture, air, moist air, incompatible materials.

Incompatibility with various substances:
Reactive with acids, moisture. The product may undergo hazardous decomposition, condensation or polymerization, it may react violently with water to emit toxic gases or it may become self-reactive under conditions of shock or increase in temperature or pressure.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Air sensitive. Oxidizes in air(more readily so in the presence of moisture or when in solution) to bisulfite and aquires an acid reaction. It is a strong reducing agent and reacts violently with oxidants. Reacts with acids to form sulfur oxides. Thermal decompositon occurs violently at 190 deg. C. Avoid contact wtih oxidizing agents such as peroxides, potassium chlorate, and potassium permanganate. .

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): >500 mg/kg [Rat]. Acute dermal toxicity (LD50): >10000 mg/kg [Rabbit].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:
Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant), of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. Contact dermatitis may develop in sensitive individuals. Causes eye irritation and possible eye damage. Inhalation: It can irritate the respiratory tract (nose, throat, lungs)and cause wheezing, and/or shortness of breath. Ingestion: May be harmful if ingested. It can cause gastrointestinal tract irritation with nausea, abdominal pain, vomiting, and diarrhea. It may also affect behavior/central nervous system and cause headache, irritability, restlessness, and convulsions. Ingestion of large amounts may also cause hypotension, and cardiovascular collapse. Hypersensitivity reactions, occurring more frequently in asthmatics, may produce bronchoconstriction, diaphoresis, flushing, tachypnea, dyspnea, rhinorrhea, urticaria, tachycardia, hypotension and anaphylaxis. Chronic Potential Health Effects: Skin: Prolonged contact may cause skin irritation.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 4.2: Spontaneously combustible substance.

Identification: : Sodium dithionate UNNA: 1384 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Sodium hydrosulfite Rhode Island RTK hazardous substances: Sodium hydrosulfite Pennsylvania RTK: Sodium hydrosulfite Massachusetts RTK: Sodium hydrosulfite New Jersey: Sodium hydrosulfite TSCA 8(b) inventory: Sodium hydrosulfite

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-6: Reactive and very flammable material. CLASS F: Dangerously reactive material.

DSCL (EEC):
R7- May cause fire. R22- Harmful if swallowed. R31- Contact with acids liberates toxic gas. S7/8- Keep container tightly closed and dry. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28- After contact with skin, wash immediately with plenty of water. S43- In case of fire, never use water.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du rÃ¨glement sur le transport des marchandises dangeureuses au canada. Centre de conformitÃ© internatinal LtÃ©e. 1986.

Other Special Considerations: Not available.

Created: 10/10/2005 08:27 PM

Last Updated: 11/01/2010 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

Section 8

Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

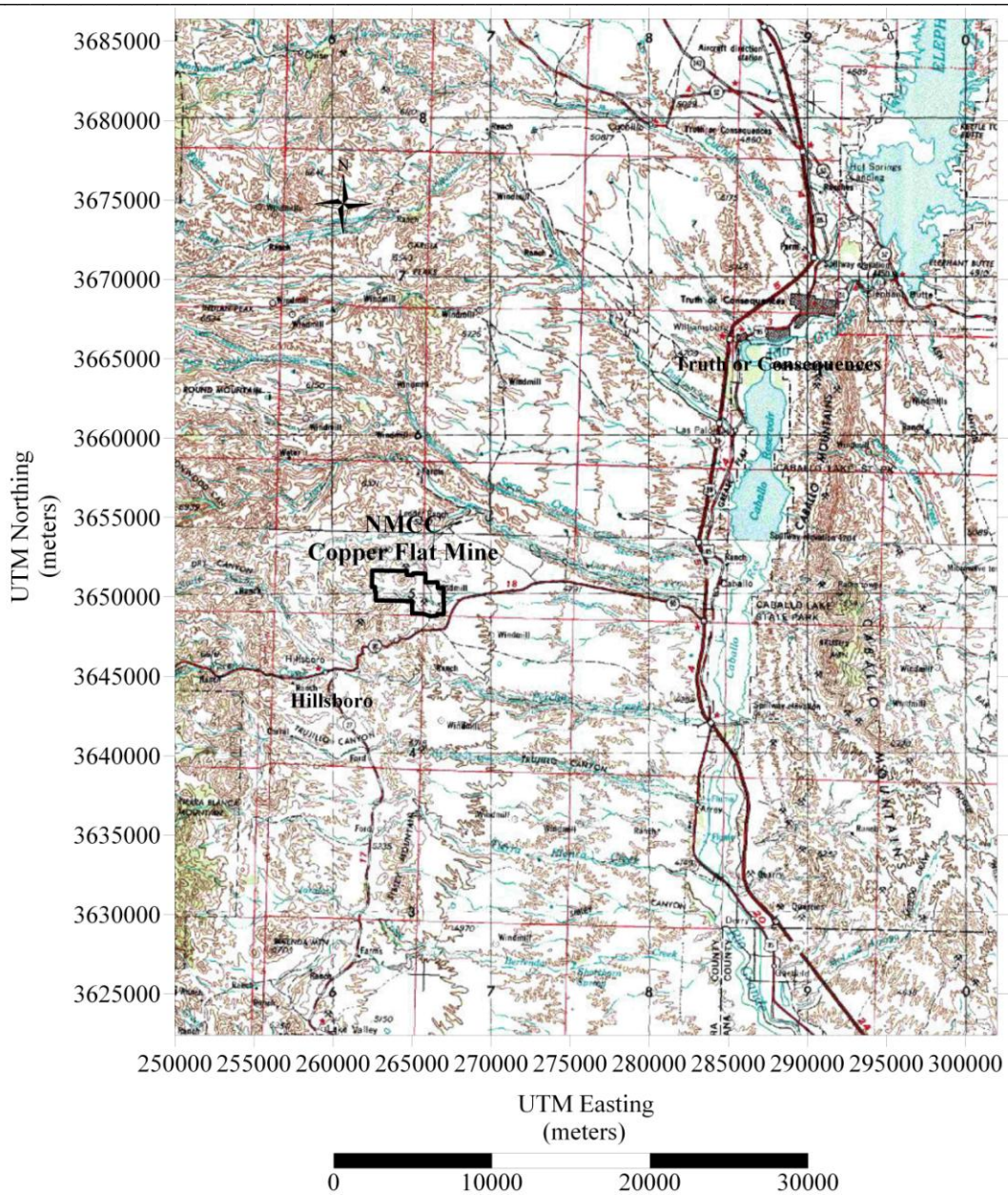


Figure 8-1: Regional Topographical Location of Copper Flat Mine

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)
(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

✓ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

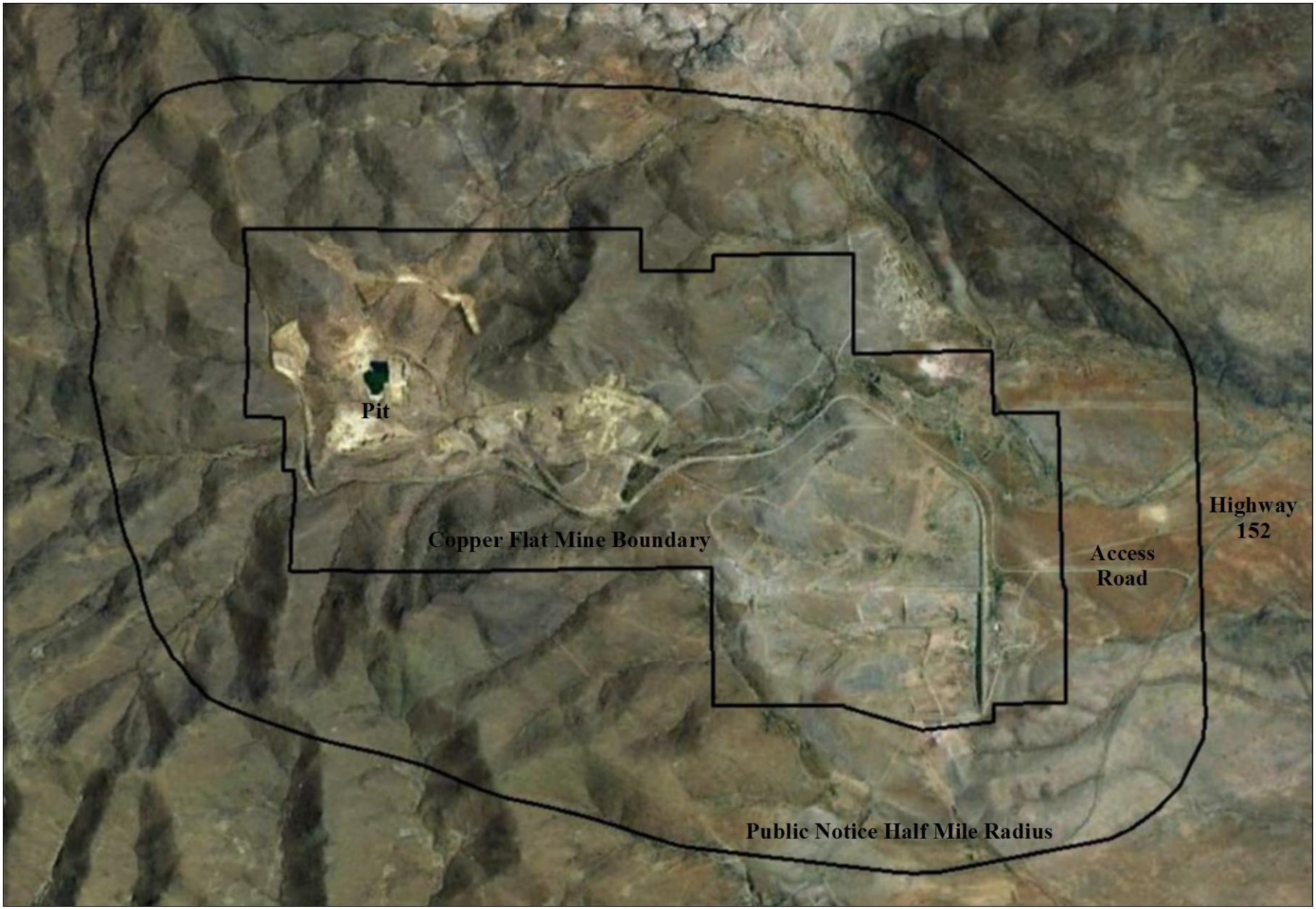
Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

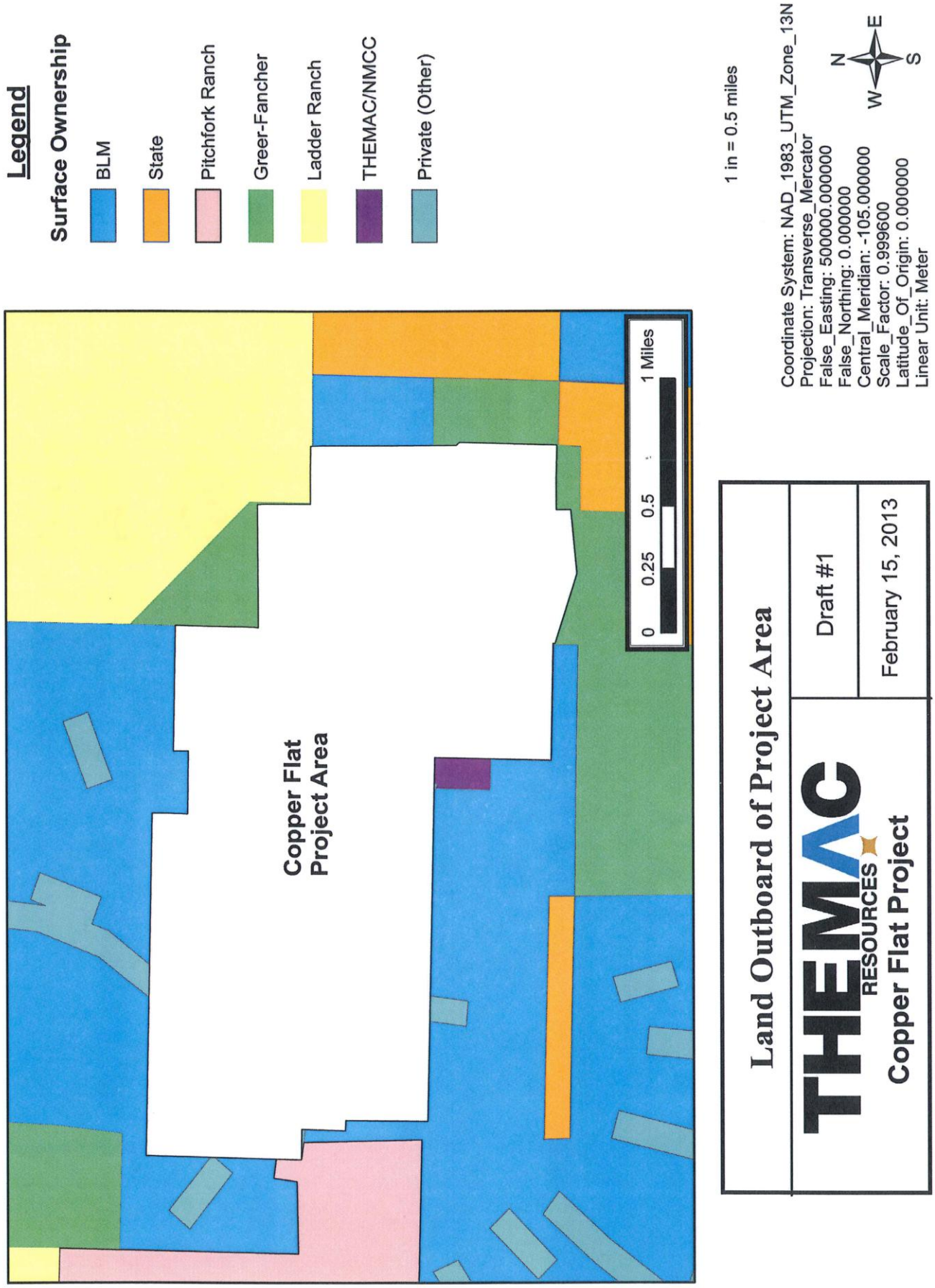
New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. ✓ A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. ✓ A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. ✓ A copy of the property tax record (20.2.72.203.B NMAC).
4. ✓ A sample of the letters sent to the owners of record.
5. ✓ A sample of the letters sent to counties, municipalities, and Indian tribes.
6. ✓ A sample of the public notice posted and a verification of the local postings.
7. ✓ A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. ✓ A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. ✓ A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. ✓ A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. ✓ A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.


Pit
Copper Flat Mine Boundary
Highway
152
Access
Road
Public Notice Half Mile Radius


Legend
Surface Ownership
BLM
State
Pitchfork Ranch
Greer-Fancher
Ladder Ranch
THEMAC/NMCC
Private (Other)
Copper Flat Project Area
0 0.25 0.5 1 Miles
1 in = 0.5 miles
Coordinate System: NAD_1983_UTM_Zone_13N
Projection: Transverse_Mercator
False_Easting: 500000.000000
False_Northing: 0.000000
Central_Meridian: -105.000000
Scale_Factor: 0.999600
Latitude_Of_Origin: 0.000000
Linear Unit: Meter
N
E
S
W
Land Outboard of Project Area
THEMAC RESOURCES
Copper Flat Project
Draft #1
February 15, 2013

List of Landowners within ½ mile of Copper Flat Mine Restricted Boundary

Ladder Ranch
Attn: Steve Dobrott
HC 31, Box 95
Caballo, NM 87931

Ryan and Wendy Fancher
PO Box 344
Radium Springs, NM 88054

Ryan and Wendy Fancher
12400 Fort Bayard Rd.
Las Cruces, NM 88007

Hillsboro Pitchfork Ranch, LLC
Attn: Mr. Cunningham
10571 Oral Zumwalt Way
Missoula MT, 59803

NV Brower and WL Easton
308 Ave F
Redondo Beach, CA 90277

BLM
Las Cruces District Office
Attn: Doug Haywood
1800 Marquess Street
Las Cruces, NM 88005-3370

List of Government Entities within 10 mile of Copper Flat Mine Restricted Boundary

Sierra County Clerk
Attn: Connie Greer
100 N. Date
Truth or Consequences, NM 87901

_____[date]

CERTIFIED MAIL XXXX XXXX XXXX XXXX
RETURN RECEIPT REQUESTED *(certified mail is required, return receipt is optional)*

Dear Neighbor
According to New Mexico air quality regulations, New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Ltd. (THEMAC), must announce its intent to apply to the New Mexico Environment Department for a 20.2.72 NMAC minor source air quality construction permit for a proposed open pit copper mine identified as "Copper Flat Mine". The expected date of the application submittal is February 15, 2013.

The center of the mineralization (open-pit) is at approximately UTM coordinates 263,150 meters easting, 3,650,750 meters northing, Zone 13, NAD 83. The Copper Flat Mine is 3.8 miles northeast of Hillsboro, New Mexico in Sierra County and approximately 20 miles southwest of Truth or Consequences, New Mexico.

The Copper Flat Mine is a copper/molybdenum porphyry deposit located in the Hillsboro Mining District in Sierra County, South Central New Mexico. Over the life of the mine, approximately 159 million tons of material would be mined. The mining of the open pit would be by conventional truck and shovel open-pit method. Run-of –mine (ROM) ore will be trucked from the open-pit mine to a primary crusher, where it is nominal sized to less than 8 inches in diameter and stored in a course ore stockpile located near the mill. Material from the coarse ore stockpile would be reclaimed and conveyed into the mill for grinding and concentrating, by a flotation process, into copper and molybdenum concentrate. The copper and molybdenum concentrates would then be loaded into trucks and shipped offsite for further processing. Concentrating process waste would be stored at an onsite tailing disposal area.

The estimated maximum quantities of any regulated air contaminants after the modification will be:
(Process emissions include: ore milling and concentrating processes)
(Fugitive emissions include: open-pit mining operations, raw ore material handling, vehicle traffic road dust, bulldozer operations, tailing area material handling, and wind-blown dust)

	Total Facility Emissions		**Process Emissions**		**Fugitive Emissions**	
Pollutant:	**Pounds per hour**	**Tons per year**	**Pounds per hour**	**Tons per year**	**Pounds per hour**	**Tons per year**
Total Suspended Particulates (TSP)	307 pph	723 tpy	5.4 pph	23 tpy	302 pph	700 tpy
PM_{10}	107 pph	245 tpy	4.4 pph	19 tpy	103 pph	226 tpy
$PM_{2.5}$	21 pph	53 tpy	3.6 pph	15 tpy	17 pph	38 tpy
Sulfur Dioxide (SO_2)		6.4 tpy				6.4 tpy
Nitrogen Oxides (NO_x)		54 tpy				54 tpy
Carbon Monoxide (CO)		214 tpy				214 tpy
Hazardous Air Pollutants (HAPs)	<0.5 pph	<0.5 tpy	<0.5 pph	<0.5 tpy		
State Toxic Air Pollutants (TAPs)	1.1 pph	4.6 tpy	1.1 pph	4.6 tpy		

The proposed hours of operation that will be permitted are 24 hours per day, 7 days per week, and 8760 hours per year.

The owner and/or operator of the Facility is:

New Mexico Copper Corporation (NMCC)
2424 Louisiana Blvd., NE, Suite 301
Albuquerque, NM 87110

If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:

Permit Programs Manager
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113
(505) 476-4300

Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Sincerely,

Jens Deichmann
Project Manager
THEMAC
Copper Flat Mine Project

7008 1140 0003 2306 6344

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

Postmark Here
USPS ALBUQUERQUE, NM 87110-3801 FEB 19 2013

Sent To Hillsboro Pitchfork Ranch, LLC
Street, Apt. or PO Box Attn: Mr. Cunningham
City, State, 10571 Oral Zumwalt Way
Missoula MT, 59803

PS Form 3800, August 2006 See Reverse for Instructions

7008 1140 0003 2306 6351

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

Postmark Here
USPS ALBUQUERQUE, NM 87110-3801 FEB 19 2013

Sent To Ladder Ranch
Street, Apt. or PO Box Attn: Steve Dobrott
City, State, HC 31, Box 95
Caballo, NM 87931

PS Form 3800, August 2006 See Reverse for Instructions

7008 1140 0003 2306 6399

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

Postmark Here
USPS ALBUQUERQUE, NM 87110-3801 FEB 19 2013

Sent To BLM
Street, Apt. Las Cruces District Office
or PO Box Attn: Doug Haywood
City, State, 1800 Marquess Street
Las Cruces, NM 88005-3370

PS Form 3800, August 2006 See Reverse for Instructions

7008 1140 0003 2306 6382

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

Postmark Here
USPS ALBUQUERQUE, NM 87110-3801 FEB 19 2013

Sent To Ryan and Wendy Fancher
Street, Apt. PO Box 344
or PO Box Radium Springs, NM 88054
City, State,

PS Form 3800, August 2006 See Reverse for Instructions

7008 1140 0003 2306 6412

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

Postmark Here
USPS ALBUQUERQUE, NM 87110-3801 FEB 19 2013

Sent To NV Brower and WL Easton
Street, Apt. 308 Ave F
or PO Box Redondo Beach, CA 90277
City, State,

PS Form 3800, August 2006 See Reverse for Instructions

7008 1140 0003 2306 6405

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

Postmark Here
USPS ALBUQUERQUE, NM 87110-3801 FEB 19 2013

Sent To Ryan and Wendy Fancher
Street, Apt. No. 12400 Fort Bayard Rd.
or PO Box No. Las Cruces, NM 88007
City, State, Zi

PS Form 3800, August 2006 See Reverse for Instructions

7008 1140 0003 2303 6429

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com®

OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

ALBUQUERQUE, NM 87110-3801 USPS FEB 1 2013 Postmark Here

Sent To: Sierra County Clerk
Attn: Connie Greer
Street, Apt. or PO Box: 100 N. Date
City, State: Truth or Consequences, NM 87901

PS Form 3800, August 2006 — See Reverse for Instructions

NOTICE

New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Ltd. (THEMAC), announces its intent to apply to the New Mexico Environment Department for a 20.2.72 NMAC minor source air quality construction permit for a proposed open pit copper mine identified as "Copper Flat Mine". The expected date of the application submittal is February 15, 2013. This notice is a requirement of the New Mexico air quality regulations.

The center of the mineralization (open-pit) is at approximately UTM coordinates 263,150 meters easting, 3,650,750 meters northing, Zone 13, NAD 83. The Copper Flat Mine is 3.8 miles northeast of Hillsboro, New Mexico in Sierra County and approximately 20 miles southwest of Truth or Consequences, New Mexico.

The Copper Flat Mine is a copper/molybdenum porphyry deposit located in the Hillsboro Mining District in Sierra County, South Central New Mexico. Over the life of the mine, approximately 159 million tons of material would be mined. The mining of the open pit would be by conventional truck and shovel open-pit method. Run-of –mine (ROM) ore will be trucked from the open-pit mine to a primary crusher, where it is nominal sized to less than 8 inches in diameter and stored in a course ore stockpile located near the mill. Material from the coarse ore stockpile would be reclaimed and conveyed into the mill for grinding and concentrating, by a flotation process, into copper and molybdenum concentrate. The copper and molybdenum concentrates would then be loaded into trucks and shipped offsite for further processing. Concentrating process waste would be stored at an onsite tailing disposal area.

The estimated maximum quantities of any regulated air contaminants after the modification will be:
(Process emissions include: ore milling and concentrating processes)
(Fugitive emissions include: open-pit mining operations, raw ore material handling, vehicle traffic road dust, bulldozer operations, tailing area material handling, and wind-blown dust)

	Total Facility Emissions		**Process Emissions**		**Fugitive Emissions**	
Pollutant:	**Pounds per hour**	**Tons per year**	**Pounds per hour**	**Tons per year**	**Pounds per hour**	**Tons per year**
Total Suspended Particulates (TSP)	307 pph	723 tpy	5.4 pph	23 tpy	302 pph	700 tpy
PM_{10}	107 pph	245 tpy	4.4 pph	19 tpy	103 pph	226 tpy
$PM_{2.5}$	21 pph	53 tpy	3.6 pph	15 tpy	17 pph	38 tpy
Sulfur Dioxide (SO_2)		6.4 tpy				6.4 tpy
Nitrogen Oxides (NO_x)		54 tpy				54 tpy
Carbon Monoxide (CO)		214 tpy				214 tpy
Hazardous Air Pollutants (HAPs)	<0.5 pph	<0.5 tpy	<0.5 pph	<0.5 tpy		
State Toxic Air Pollutants (TAPs)	1.1 pph	4.6 tpy	1.1 pph	4.6 tpy		

The proposed hours of operation that will be permitted are 24 hours per day, 7 days per week, and 8760 hours per year.

The owner and/or operator of the Facility is:

New Mexico Copper Corporation (NMCC)
2424 Louisiana Blvd., NE, Suite 301
Albuquerque, NM 87110

If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:

Permit Programs Manager
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113
(505) 476-4300

Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location. (505) 476-4300 or 1 800 224-7009
Fax: (505) 476-4375

General Posting of Notices – Certification

I, Omar EL-Emawy, the undersigned, certify that on *Tuesday, February 19, 2013*, posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the city of Truth or Consequences and community of Hillsboro in Sierra County, State of New Mexico on the following dates:

1. Entrance to Facility on *Tuesday, February 19, 2013*.
2. Truth or Consequences, NM Post Office, on *Tuesday, February 19, 2013*
3. Caballo, NM Post Office, on *Tuesday, February 19, 2013*
4. Hillsboro, NM Post Office, on *Tuesday, February 19, 2013*

Signed this Wednesday of February 20th, 2013

Signature

2/20/2013
Date

Omar EL-Emawy
Printed Name

Office Manager/Analyst
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

NOTICE OF AIR QUALITY PERMIT APPLICATION

New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Ltd. (THEMAC), announces its intent to apply to the New Mexico Environment Department for a 20.2.72 NMAC minor source air quality construction permit for a proposed open pit copper mine identified as "Copper Flat Mine". The expected date of the application submittal is February 15, 2013. This notice is a requirement of the New Mexico air quality regulations.

The center of the mineralization (open-pit) is at approximately UTM coordinates 263,150 meters easting, 3,650,750 meters northing, Zone 13, NAD 83. The Copper Flat Mine is 3.8 miles northeast of Hillsboro, New Mexico in Sierra County and approximately 20 miles southwest of Truth or Consequences, New Mexico.

The Copper Flat Mine is a copper/molybdenum porphyry deposit located in the Hillsboro Mining District in Sierra County, South Central New Mexico. Over the life of the mine, approximately 159 million tons of material would be mined. The mining of the open pit would be by conventional truck and shovel open-pit method. Run-of –mine (ROM) ore will be trucked from the open-pit mine to a primary crusher, where it is nominal sized to less than 8 inches in diameter and stored in a course ore stockpile located near the mill. Material from the coarse ore stockpile would be reclaimed and conveyed into the mill for grinding and concentrating, by a flotation process, into copper and molybdenum concentrate. The copper and molybdenum concentrates would then be loaded into trucks and shipped offsite for further processing. Concentrating process waste would be stored at an onsite tailing disposal area.

The estimated maximum quantities of any regulated air contaminants after the modification will be:
(Process emissions include: ore milling and concentrating processes)
(Fugitive emissions include: open-pit mining operations, raw ore material handling, vehicle traffic road dust, bulldozer operations, tailing area material handling, and wind-blown dust)

	Total Facility Emissions		**Process Emissions**		**Fugitive Emissions**	
Pollutant:	**Pounds per hour**	**Tons per year**	**Pounds per hour**	**Tons per year**	**Pounds per hour**	**Tons per year**
Total Suspended Particulates (TSP)	307 pph	723 tpy	5.4 pph	23 tpy	302 pph	700 tpy
PM_{10}	107 pph	245 tpy	4.4 pph	19 tpy	103 pph	226 tpy
$PM_{2.5}$	21 pph	53 tpy	3.6 pph	15 tpy	17 pph	38 tpy
Sulfur Dioxide (SO_2)		6.4 tpy				6.4 tpy
Nitrogen Oxides (NO_x)		54 tpy				54 tpy
Carbon Monoxide (CO)		214 tpy				214 tpy
Hazardous Air Pollutants (HAPs)	<0.5 pph	<0.5 tpy	<0.5 pph	<0.5 tpy		
State Toxic Air Pollutants (TAPs)	1.1 pph	4.6 tpy	1.1 pph	4.6 tpy		

The proposed hours of operation that will be permitted are 24 hours per day, 7 days per week, and 8760 hours per year.

The owner and/or operator of the Facility is:

New Mexico Copper Corporation (NMCC)
2424 Louisiana Blvd., NE, Suite 301
Albuquerque, NM 87110

If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:

Permit Programs Manager
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113
(505) 476-4300

Other comments and questions may be submitted verbally.

Please refer to the company name and site name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

PROOF OF PUBLICATION

RECEIVED
FEB 21 2013
By

The following legal notice has been published in THE HERALD, a weekly newspaper published at Truth or Consequences, Sierra County, State of New Mexico.

Class One Technical Services Air Quality Permit Application

in said newspaper on Feb. 20, 2013, to and including .....

20 ....., inserting same in the issue of

SIGNED: Kim Lucero

TITLE: Admin Assist

Subscribed and sworn to before me this 20th day of Feb., 20 13

Maureen Toole

Notary Publ

My Commission expires Feb. 10, 2014

LEGAL NOTICE
NOTICE OF AIR QUAL
PERMIT APPLICATIO

New Mexico Copper Co
tion (NMCC), a wholly
subsidiary of THEMAC
sources Group Ltd. (THE
announces its intent to ap
the New Mexico Enviro
Department for a 20
NMAC minor source air
construction permit for a
posed open pit copper
identified as "Copper
Mine". The expected da
the application submitt
February 15, 2013. This
is a requirement of the
Mexico air quality regula
The center of the mine
tion (open-pit) is at ap
mately UTM coordi
263,150 meters ea
3,650,750 meters nor
Zone 13, NAD 83. The Co

conveyed into
inding and con-
a flotation pro-
per and molyb-
ntrate. The cop-
denum concen-
then be loaded
shipped offsite
rocessing. Con-
rocess waste
ed at an onsite
al area. The esti-
um quantities of
air contaminants
ification will be:
ssions include:
d concentrating
itive emissions
pit mining oper-
e material han-
traffic road dust,
erations, tailing
handling, and
st)

Pollutant:	Tons per year
Total Suspended Particulates (TSI	700 tpy
PM_{10}	226 tpy
$PM_{2.5}$	38 tpy
Sulfur Dioxide (SO_2)	6.4 tpy
Nitrogen Oxides (NO_x)	54 tpy
Carbon Monoxide (CO)	214 tpy
Hazardous Air Pollutants (HAPs)	
State Toxic Air Pollutants (TAPs)	

The proposed hours of o
tion that will be permitte
24 hours per day, 7 day
week, and 8760 hours
year. The owner and/or o
tor of the Facility is:
New Mexico Copper Co
tion (NMCC)
2424 Louisiana Blvd.,
Suite 301
Albuquerque, NM 87110
If you have any comm
about the construction or
ation of the above facility
you want your comments
made as part of the perm
view process, you must s

plication at the
otice. Please in-
mailing address
ments. Once the
as performed a
iew of the appli-
air quality im-
artment's notice
ed in the legal
ewspaper circu-
acility location.
ld
e
ices
20, 2013
osted at
ticeads.com
**

s Sierra

OPOSALS
TTED IN A
PE WITH
ER AND
CLEARLY
THE BOT-
SIDE OF
THE ENVE-

ved at 855
3:00 PM
y Proposals
time will be
turned un-

ORY PRE-
erence will
ebruary 26,
t the Sierra
ion Building,
uth or Con-
lexico.
s/contractors
ocuments af-
2013 at the
inistration
Patten
nces,

aining to this
directed to:
575-894-6215

m.gov email

inistration

ed at
eads.com

OTICE

OTICE
Hospital
Board
uary meeting
Board will be
Vista Hospital
February 27,

g agenda will
e Administra-
rra Vista Hos-
fore the meet-
hy Elverum at
2 for copies or
can also visit
current news
of the meeting

d
a Hospital
13
sted at
ceads.com
*

NOTICE

for Bid

ber: 12-10-12

LEGAL NOTICE
NOTICE OF AIR QUALITY PERMIT APPLICATION

New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Ltd. (THEMAC), announces its intent to apply to the New Mexico Environment Department for a 20.2.72 NMAC minor source air quality construction permit for a proposed open pit copper mine identified as "Copper Flat Mine". The expected date of the application submittal is February 15, 2013. This notice is a requirement of the New Mexico air quality regulations. The center of the mineralization (open-pit) is at approximately UTM coordinates 263,150 meters easting, 3,650,750 meters northing, Zone 13, NAD 83. The Copper Flat Mine is 3.8 miles northeast of Hillsboro, New Mexico in Sierra County and approximately 20 miles southwest of Truth or Consequences, New Mexico. The Copper Flat Mine is a copper/molybdenum porphyry deposit located in the Hillsboro Mining District in Sierra County, South Central New Mexico. Over the life of the mine, approximately 159 million tons of material would be mined. The mining of the open pit would be by conventional truck and shovel open-pit method. Run-of -mine (ROM) ore will be trucked from the open-pit mine to a primary crusher, where it is nominal sized to less than 8 inches in diameter and stored in a course ore stockpile located near the mill. Material from the coarse ore stockpile would be reclaimed and conveyed into the mill for grinding and concentrating, by a flotation process, into copper and molybdenum concentrate. The copper and molybdenum concentrates would then be loaded into trucks and shipped offsite for further processing. Concentrating process waste would be stored at an onsite tailing disposal area. The estimated maximum quantities of any regulated air contaminants after the modification will be: (Process emissions include: ore milling and concentrating processes) (Fugitive emissions include: open-pit mining operations, raw ore material handling, vehicle traffic road dust, bulldozer operations, tailing area material handling, and wind-blown dust)
Insert PDF

Pollutant:	Total Facility Emissions		Process Emissions		Fugitive Emissions	
	Pounds per hour	Tons per year	Pounds per hour	Tons per year	Pounds per hour	Tons per year
Total Suspended Particulates (TSP)	307 pph	723 tpy	5.4 pph	23 tpy	302 pph	700 tpy
PM_{10}	107 pph	245 tpy	4.4 pph	19 tpy	103 pph	226 tpy
$PM_{2.5}$	21 pph	53 tpy	3.6 pph	15 tpy	17 pph	38 tpy
Sulfur Dioxide (SO_2)		6.4 tpy				6.4 tpy
Nitrogen Oxides (NO_x)		54 tpy				54 tpy
Carbon Monoxide (CO)		214 tpy				214 tpy
Hazardous Air Pollutants (HAPs)	<0.5 pph	<0.5 tpy	<0.5 pph	<0.5 tpy		
State Toxic Air Pollutants (TAPs)	1.1 pph	4.6 tpy	1.1 pph	4.6 tpy		

The proposed hours of operation that will be permitted are 24 hours per day, 7 days per week, and 8760 hours per year. The owner and/or operator of the Facility is:
New Mexico Copper Corporation (NMCC)
2424 Louisiana Blvd., NE, Suite 301
Albuquerque, NM 87110
If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:
Permit Programs Manager
New Mexico Environment Department Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113
(505) 476-4300
Other comments and questions may be submitted verbally.
Please refer to the company name and site name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.
Pub: The Herald
Req: Class One
Technical Services
Pub: February 20, 2013
This legal is posted at
www.publicnoticeads.com
***

---

ment consists of purchase of a new Class A Pumper truck.
IMPORTANT-PROPOSALS MUST BE SUBMITTED IN A SEALED ENVELOPE WITH THE BID NUMBER AND OPENING DATE CLEARLY INDICATED ON THE BOTTOM LEFT HAND SIDE OF THE FRONT OF THE ENVELOPE.
Bids will be received at 855 Van Patten until 3:00 PM March 5, 2013. Any Proposals received after said time will be rejected and returned unopened.
Interested vendors/contractors may obtain Bid documents after February 18 at the Sierra County Administration Building 855 Van Patten Truth or Consequences, New Mexico .
All questions pertaining to this project should be directed to:
Sandy Jones 575-894-6215 Voice
sj@sierracountynm.gov Email
Pub: The Herald
Req: County Administration
February 13, 20, 2013
This legal is posted at
www.publicnoticeads.com
***

LEGAL NOTICE

NOTICE OF REGULAR BOARD MEETING

The Truth or Consequences Housing Authority's Board of Commissioners will hold a Regular Board Meeting at 5:30 PM on Thursday, February 21, 2013. This meeting will be held at the Truth or Consequences Housing Authority, located at 108 S. Cedar, Truth or Consequences, NM. Agendas available at the Housing Authority 24 hours prior to the meeting.
s/Steven Rios

PUBLIC SERVICE ANNOUNCEMENT

New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Ltd. (THEMAC), announces its intent to apply to the New Mexico Environment Department for a 20.2.72 NMAC minor source air quality construction permit for a proposed open pit copper mine identified as "Copper Flat Mine". The expected date of the application submittal is February 15, 2013. This notice is a requirement of the New Mexico air quality regulations.

The center of the mineralization (open-pit) is at approximately UTM coordinates 263,150 meters easting, 3,650,750 meters northing, Zone 13, NAD 83. The Copper Flat Mine is 3.8 miles northeast of Hillsboro, New Mexico in Sierra County and approximately 20 miles southwest of Truth or Consequences, New Mexico.

The Copper Flat Mine is a copper/molybdenum porphyry deposit located in the Hillsboro Mining District in Sierra County, South Central New Mexico. Over the life of the mine, approximately 159 million tons of material would be mined. The mining of the open pit would be by conventional truck and shovel open-pit method. Run-of –mine (ROM) ore will be trucked from the open-pit mine to a primary crusher, where it is nominal sized to less than 8 inches in diameter and stored in a course ore stockpile located near the mill. Material from the coarse ore stockpile would be reclaimed and conveyed into the mill for grinding and concentrating, by a flotation process, into copper and molybdenum concentrate. The copper and molybdenum concentrates would then be loaded into trucks and shipped offsite for further processing. Concentrating process waste would be stored at an onsite tailing disposal area.

Public notices have been posted in the following locations for review by the public:

1. Post Office in Truth or Consequences, NM; 1507 N Date St
2. Post Office in Caballo, NM; 14730 Highway 187
3. Post Office in Hillsboro, NM; 300 Main St
4. At the entrance to the proposed location of the facility.

The owner and/or operator of the Facility is:

New Mexico Copper Corporation (NMCC)
2424 Louisiana Blvd., NE, Suite 301
Albuquerque, NM 87110

If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to:

Permit Programs Manager
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113
(505) 476-4300

Other comments and questions may be submitted verbally.

Please refer to the company name and site name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Submittal of Public Service Announcement – Certification

I, Paul Wade, the undersigned, certify that on February 20, 2013, submitted a public service announcement to KXMT/KKTC/KKIT/KVOT Radio that serves the Hillsboro, Sierra County, New Mexico, in which the source is located and that KXMT/KKTC/KKIT/KVOT Radio did not respond that it would not air the announcement.

Signed this 20th day of February, 2013,

Paul Wade
Signature

2/20/13
Date

Paul Wade
Printed Name

Air Permitting Consultant, Class One Technical Services, Inc.
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

February 20, 2013

KCHS Radio/GPK Media
P.O. Box 351
Truth or Consequences, New Mexico 87901

Dear Sirs:

Subject: New Mexico Copper Corporation – 20.2.72 NMAC – Copper Flat Mine – Public Service Announcement

Please read the attached on the air as a "Public Service Announcement".

Please let me know if you have questions. I can be reached at (505) 830-9680 ext 102. Thank you in advance.

Sincerely,

Paul Wade

Paul Wade
Project Engineer
Class One Technical Services, Inc.

7008 1140 0003 2306 6436

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com®

OFFICIAL USE

Postage	$ .46
Certified Fee	3.10
Return Receipt Fee (Endorsement Required)	2.55
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.11

ALBUQUERQUE, NM 87110-3807
Postmark Here
FEB 20 2013
USPS

Sent To	KCHS Radio/GPK Media
Street, Apt. No.; or PO Box No.	PO Box 351
City, State, ZIP+4	T or C NM 87901-0351

PS Form 3800, August 2006 See Reverse for Instructions

Section 10

Written Description of the Routine Operations of the Facility

---

A written description of the routine operations of the facility. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

Ore material from the pit would be drilled and blasted (S1 and S2), loaded and hauled out of the pit to the primary crusher. Drilling and blasting will break up the rock in the open pit. Blasting would be limited to daylight (afternoon) hours and performed by licensed blasters. Ammonium nitrate prill and diesel fuel (ANFO) will be used as the explosive. Prill will be stored in a silo (S3) located near the open pit. The broken rock would be loaded by using hydraulic shovels and/or frontend loaders onto end dump haul trucks (S4) for transport to the primary crusher, low grade stockpile, or Waste Rock Disposal Facility (WRDF) depending on the assay classification. A bulldozer (S5) will be used to move ore assisting with end dump haul truck loading. Actual operation of the bulldozer in moving material, based on normal industry practices, is 45% of time the bulldozer is operating. Ore and waste rock haulage (S29) would be handled by a fleet of end-dump, diesel-powered haulage trucks of a 100 ton capacity.

Waste rock disposal facilities (WRDFs) would be located 3,000 to 4,000 feet east of the pit exit. Waste rock will be hauled from the pit (S29) and unloaded at the WRDF (S23). A bulldozer (S24) will be used to maintain waste rock area. Actual operation of the bulldozer in moving material, based on normal industry practices, is 33% of the time the bulldozer is operating.

The low grade stockpile is located to the northeast of the mine. Low grade ore will be hauled from the pit (S29) and unloaded at the WRDF (S21). A bulldozer (S22) will be used to maintain low grade stockpile area. Actual operation of the bulldozer in moving material, based on normal industry practices, is 33% of the time the bulldozer is operating. The location was selected to be a reasonable haul during the mine life for the storage of the material as well as a short haul distance to the crusher at the end of the mine life.

The primary crusher (S8) is to be located about 2,500 feet east of the pit. Run-of –mine (ROM) ore is trucked from the mine to the primary crusher where it is dumped directly into the crusher surge bin (S6) that feeds (S7) a gyratory crusher, which crushes the ROM ore to a nominal size of less than 8 inches in diameter. Crusher discharge would be fed by apron feeder (S9) onto a belt conveyor for transport to the coarse ore stockpile (S10) located near the mill. During primary crusher down time, ore at the coarse ore stockpile would be moved from the “dead” storage area to the “live” storage area by front-end loader or bulldozer (S11). Actual operation of the bulldozer in moving material, based on normal industry practices, is 33% of the time the bulldozer is operating.

Two reclaim chutes beneath the coarse ore stockpile would direct ore onto apron feeders (S12) and feed ore onto a belt conveyor (S13) for transport into a large diameter semi-autogenous (SAG) mill (S14) for the first stage of grinding and processing at the flotation plant.

The flotation plant will consist of copper and molybdenum flotation circuits. The copper and molybdenum minerals will be concentrated in a bulk copper/moly concentrate. The moly mineral will be separated from the copper minerals in a moly flotation circuit. The bulk (copper-moly) flotation circuit will consist of rougher flotation, concentrate regrind, first cleaner /first cleaner/scavenger flotation, and second cleaner flotation. The moly flotation circuit will consist moly separation (rougher) flotation, moly first cleaner flotation, concentrate regrind, moly second cleaner flotation and moly third cleaner flotation. From the SAG mill loading to the final concentrate all processes are wet, with no expectation of regulated air emissions.

Final copper concentrate will be thickened, filtered, (S18) and loaded in trucks (S20) for shipment.

Final molybdenite concentrate will be thickened, filtered, dried, (S16) and packaged into containers (S17) for shipment (S19). Drying of the molybdenum concentrate will be done with a Holoflite type electrically heated (line power) oil that dries the molybdenum concentrate as it travels through an enclosed screw conveyor.

Process tailings would be transported from the mill via slurry pipeline and deposited at the tailing area. Tailings from the bulk rougher flotation process are transported to the Tailing Storage Facility (TSF) where hydrocyclones are used to produce sands to build the centerline TSF dam. The cyclone overflow is deposited to the interior of the impoundment and produces a supernatant water pond that is used to reclaim water from the tailings for reuse in the milling process.

During TSF dam construction, bulldozers and compactors (S25) will be used to compact the sands used to construct the dam.

During the initial 4 years of operating the mine and mill, topsoil with be removed from the tailing area and stored in borrow storage piles adjacent to the tailing area. This activity will be performed with scrapers. It includes; scraper loading of topsoil (S26), scraper unloading of topsoil onto the piles (S27), and scraper travel (S28). Fugitive dust will be controlled by watering during scraper travel.

For the most part, existing haul roads (S29) would be utilized to haul material to the crusher, stockpiles, and WRDF. The facility access road will be used to haul product and delivery chemicals to the site (S30). During operation of the Copper Flat Project, graders (S31) will be used to maintain roads and water trucks would be used, as needed, to control emissions of fugitive dust from the haul roads, as well as other roads within the project area. Wetting agents and binding agents, such as magnesium chloride, may also be used to control dust if conditions warrant.

Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:** Open-pit copper mine and concentration mill

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

✓ **Yes** ☐ **No**

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

✓ **Yes** ☐ **No**

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

✓ **Yes** ☐ **No**

C. Make a determination:

✓ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

Section 12

Section 12.A
PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

A PSD applicability determination for all sources. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- ✓ **a minor PSD source.**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☐ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

B. **This facility is not one of the listed 20.2.74.501 Table I – PSD Source Categories.**
   a. **NOx: 54 TPY – Fugitive Emissions**
   b. **CO: 214 TPY – Fugitive Emissions**
   c. **SOx: 6.4 TPY – Fugitive Emissions**
   d. **TSP (PM): 657 TPY – Mostly Fugitive Emissions**
   e. **PM10: 222 TPY – Mostly Fugitive Emissions**
   f. **PM2.5: 48 TPY – Mostly Fugitive Emissions**

C. If this is an existing PSD major source, or any facility with emissions greater than 250 TPY (or 100 TPY for 20.2.74.501 Table 1 – PSD Source Categories), determine whether any permit modifications are related, or could be considered a single project with this action, and provide an explanation for your determination whether a PSD modification is triggered.

Section 13

Discussion Demonstrating Compliance With Each Applicable State & Federal Regulation

---

Provide a discussion demonstrating compliance with applicable state & federal regulation. If there is a state or federal regulation (other than those listed here) for your facility's source category that does not apply to your facility, but seems on the surface that it should apply, add the regulation to the appropriate table below and provide the analysis. Examples of regulatory requirements that may or may not apply to your facility include 40 CFR 60 Subpart OOO (crushers), 40 CFR 63 Subpart HHH (HAPs), or 20.2.74 NMAC (PSD major sources). We don't want a discussion of every non-applicable regulation, but if there is questionable applicability, explain why it does not apply. All input cells should be filled in, even if the response is 'No' or 'N/A'.

In the "Justification" column, identify the criteria that are critical to the applicability determination, numbering each. For each unit listed in the "Applies to Unit No(s)" column, after each listed unit, include the number(s) of the criteria that made the regulation applicable. For example, TK-1 & TK-2 would be listed as: TK-1 (1, 3, 4), TK-2 (1, 2, 4). Doing so will provide the applicability criteria for each unit, while also minimizing the length of these tables.

As this table will become part of the SOB, please do not change the any formatting in the table, especially the width of the table.

If this application includes any proposed exemptions from otherwise applicable requirements, provide a narrative explanation of these proposed exemptions. These exemptions are from specific applicable requirements, which are spelled out in the requirements themselves, not exemptions from 20.2.70 NMAC or 20.2.72 NMAC.

Table for Applicable STATE REGULATIONS:

STATE REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Federally Enforce-able	Does Not Apply	JUSTIFICATION: Identify the applicability criteria, numbering each (i.e. 1. Post 7/23/84, 2. 75 m^3, 3. VOL)
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	X		X		20.2.3 NMAC is a SIP approved regulation that limits the maximum allowable concentration of Total Suspended Particulates, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide.
20.2.7 NMAC	Excess Emissions	X		X		This facility is subject to 20.2.72 NMAC.
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide				X	This facility has no gas burning sources
20.2.34 NMAC	Oil Burning Equipment: NO_2				X	This facility has no oil burning equipment
20.2.38 NMAC	Hydrocarbon Storage Facility.				X	This facility is not a hydrocarbon storage facility as defined in 20.2.38 NMAC.
20.2.61.109 NMAC	Smoke & Visible Emissions				X	This facility has no engines or heaters subject to Stationary Combustion Equipment.
20.2.70 NMAC	Operating Permits				X	No, this facility is not subject to 20.2.70 NMAC.
20.2.71 NMAC	Operating Permit Fees				X	This facility is not subject to 20.2.70 NMAC and in turn is not subject to 20.2.71 NMAC.
20.2.72 NMAC	Construction Permits	X		X		This facility is subject to 20.2.72 NMAC.

STATE REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Federally Enforce-able	Does Not Apply	JUSTIFICATION: Identify the applicability criteria, numbering each (i.e. 1. Post 7/23/84, 2. 75 m^3, 3. VOL)
20.2.73 NMAC	NOI & Emissions Inventory Requirements	X		X		**Emissions Inventory Reporting:** 20.2.73.300 NMAC applies.
20.2.74 NMAC	Permits – PSD				X	This facility is not a PSD major source
20.2.75 NMAC	Construction Permit Fees	X		X		This facility is subject to 20.2.72 NMAC and is in turn subject to 20.2.75 NMAC.
20.2.77 NMAC	New Source Performance		S7,S8,S9,S10,S12,S13,S14,S16,S17,S18,S19,S20	X		This is a stationary source which is subject to the requirements of 40 CFR Part 60, as amended through January 31, 2009.
20.2.78 NMAC	Emission Standards for HAPS				X	This facility does not emits hazardous air pollutants which are subject to the requirements of 40 CFR Part 61, as amended through January 31, 2009.
20.2.79 NMAC	Permits – Nonattainment Areas				X	This facility is located in an attainment area.
20.2.82 NMAC	MACT Standards for source categories of HAPS		EG1, EG2	X		This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63, as amended through January 31, 2009.

Table for Applicable FEDERAL REGULATIONS:

FEDERAL REGU-LATIONS CITATION	Title	Applies to **Entire Facility**	Applies to **Unit No(s).**	**Federally Enforce-able**	**Does Not Apply**	**JUSTIFICATION:**
40 CFR 50	NAAQS	X		X		National Ambient Air Quality Standards apply to this facility.
NSPS 40 CFR 60, Subpart A	General Provisions		S7,S8,S9, S10,S12, S13,S14, S16,S17, S18,S19, S20,EG1, EG2	X		Applies if any other NSPS subpart applies.
NSPS 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				X	This facility has no storage vessels as defined in 40 CFR 60.110b.
NSPS 40 CFR 60, Subpart LL	Standards of Performance for Metallic Mineral Processing Plants		S7,S8,S9, S10,S12, S13,S14, S16,S17, S18,S19, S20	X		The provisions of this subpart are applicable to the following affected facilities in metallic mineral processing plants: Each crusher and screen in open-pit mines; each crusher, screen, bucket elevator, conveyor belt transfer point, thermal dryer, product packaging station, storage bin, enclosed storage area, truck loading station, truck unloading station, railcar loading station, and railcar unloading station at the mill or concentrator.
NSPS 40 CFR 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines		EG1, EG2	X		The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE). Unit is applicable to Subpart IIII.
MACT 40 CFR 63, Subpart A	General Provisions		EG1, EG2	X		Applies if any other subpart applies.
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)		EG1, EG2	X		Facilities are subject to this subpart if they own or operate a stationary RICE, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

Section 14

Operational Plan to Mitigate Emissions

(submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

✓ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

✓ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

Section 15

Alternative Operating Scenarios

(submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

No alternative operating scenario is proposed for this facility.

Section 16

Air Dispersion Modeling

NSR (20.2.72 NMAC) and PSD (20.2.74 NMAC) Modeling: Provide an air quality **dispersion modeling** demonstration (if applicable) as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines. If air dispersion modeling has been waived for this permit application, attach the AQB Modeling Section modeling waiver documentation.

SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.nmenv.state.nm.us/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.

Title V (20.2.70 NMAC) Modeling: Title V applications must specify the NSR Permit number for which air quality dispersion modeling was last submitted. Additionally, Title V facilities reporting new SSM emissions require modeling or a modeling waiver to demonstrate compliance with standards.

An AERMOD Dispersion Model Analysis was completed by Class One Technical Services, Inc. (CTS) on behalf of New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Limited (THEMAC), to determine compliance of ambient air quality impacts from NMCC's Copper Flat Mine as part of that stationary source's 20.2.72 NMAC construction permit application. The objective of this modeling evaluation was to predict if a worst-case maximum operation of Copper Flat Mine resulted in ambient air concentrations of nitrogen dioxide (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter, i.e., total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), were below New Mexico and federal ambient air quality standards, NMAAQS and NAAQS respectively, and PSD NOx and PM_{10} Class I and II Increment.

The Copper Flat Mine is a copper/molybdenum porphyry deposit located in the Las Animas Mining District in South Central New Mexico, in Sierra County. The center of the mineralization is at approximately UTM coordinates 263,150 easting, 3,650,750 northing, Zone 13, NAD 83. The project is approximately 150 miles south of Albuquerque, New Mexico, approximately 20 miles southwest of Truth or Consequences, New Mexico, and approximately 3.8 miles northeast of Hillsboro, New Mexico. Access to Copper Flat Mine from Truth or Consequences is by 24 miles of paved highway and 3 miles of all-weather gravel road. The mine will consists of an open pit mine; a nominal 25,000-ton per day crushing circuit; course ore storage pile and reclaimer; a nominal 25,000-ton per day flotation mill and concentrator plant; and waste ore and mill tailings operations. NMCC is proposing to operate 24 hours per day, seven days per week, and 365 days per year.

Copper Flat Mine is a source of particulate matter, nitrogen dioxide, carbon monoxide, and sulfur dioxide emissions. Nitrogen dioxide, carbon monoxide, and sulfur dioxide emissions occur during blasting in the open pit mine. Blasting operations will occur mostly during afternoon hours, for an estimated 290 blasts per year. Since the blasts will occur instantaneously with no schedule other than daylight/afternoon hours, modeling was performed for 1 hour per day of blasting emissions for nitrogen dioxide, carbon monoxide, and sulfur dioxide. Modeling of CO 1 hour will be performed for all afternoon hours to find the highest 1 hour impact from blasting. This same hour was then used in CO 8 hour, NOx, and SO_2 modeling. A significant majority of the modeled particulate matter emissions are from ground-release, fugitive dust sources where the maximum modeled concentrations are seen at the mine boundary. All ground-release, fugitive dust sources were modeled as "flat terrain" sources.

The dispersion modeling was conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), Version 12345. This model is recommended by EPA for determining Class II impacts within 50 km of the source being assessed. Additionally, AERMOD was developed to handle complex terrain. In this analysis, AERMOD will be used to estimate pollutant ambient air concentrations of NOx, CO, SO_2, TSP, PM_{10}, and $PM_{2.5}$ from NMCC Copper Flat Mine emission sources.

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD modeling system has three components: AERMAP, AERMET, and AERMOD. AERMAP is the terrain preprocessor program. AERMET is the meteorological data preprocessor. AERMOD includes the dispersion modeling algorithms and was developed to handle simple and complex terrain issues using improved algorithms. AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain.

AERMOD was run using all the regulatory default options including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, and no use of gradual plume rise. The model incorporated local terrain into the calculations using AERMAP, with the exception of PSD Class I modeling analysis. For PSD Class I modelings, a majority of the sources are ground release sources where complex terrain impact has little effect.

A modeling protocol was submitted to the New Mexico Environment Department – Air Quality Bureau (NMED AQB) on December 6, 2012. It was approved by David Heath of the NMED AQB – Modeling Section on January 31, 2013.

The highest model results for maximum operation of Copper Flat Mine and applicable neighboring sources are summarized below in Tables 16-1, 16-2, and 16-3. No SSM modeling was performed for this facility.

TABLE 16-1: Summary of Air Dispersion Modeling Results for Blasting Combustion Emissions

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Maximum Modeled Concentration With Background ($\mu g/m^3$)	Lowest Applicable Standard ($\mu g/m^3$)	% of Standard
CO 1 Hr.	3613	2000	5607	12438	45.1
CO 8 Hr.	452	500	1876	8261	22.7
SO_2 3 Hr.	36	25	54	1310	4.1
SO_2 24 Hr.	4.5	5	22.5	217	10.4
SO_2 Annual	0.14	1	18.14	196	9.3
NO_X 24 Hr.	38	5	97	156	62.2
NO_X Annual	1.2	1	9.0	78	11.5

Note: Background concentrations based on "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised July 29, 2011 and approved modeling protocol. Dispersion modeling inputs and settings are presented in Section 2.

TABLE 16-2: Summary of Air Dispersion Modeling Results for Particulate Emitting Sources

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Maximum Modeled Concentration With Background ($\mu g/m^3$)	Lowest Applicable Standard ($\mu g/m^3$)	% of Standard
$PM_{2.5}$ 24 Hr. High 8th High	9.8	1.2	18.9	35	54.0
$PM_{2.5}$ Annual	2.4	0.3	7.4	12	61.7
PM_{10} 24 Hr. High 2nd High	29.9	5	49.8	150	33.2
PM_{10} Annual	6.8	1	21.2	50	42.4
TSP 24 Hr.	43.0	5	65.4	150	43.6
TSP Monthly	17.7	---	50.1	90	55.7
TSP Annual	9.5	1	28.6	60	47.7

Note: Background concentrations based on "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised July 29, 2011 and approved modeling protocol. Dispersion modeling inputs and settings are presented in Section 2.

TABLE 16-3: Summary of Air Dispersion Modeling Results for PSD Increment Analysis

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)	% of Standard
PM_{10} 24 Hr. Class I Increment	0.12	8	1.5
PM_{10} Annual Class I Increment	0.0032	4	0.8
PM_{10} 24 Hr. Class II Increment High 2nd High	29.9	30	99.7
PM_{10} Annual Class II Increment	6.8	17	40.0
NO_2 Annual Class I Increment	0.01	2.5	0.4
NO_2 Annual Class II Increment	1.2	25	4.8

Section 17

Compliance Test History

(submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

Compliance Test History Table

Unit No.	Test Description	Test Date
New Facility	NA	NA

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

NA

Section 22

Green House Gas Applicability

(submitting under 20.2.70, 20.2.72, 20.2.73, 20.2.74 NMAC)

Title V (20.2.70 NMAC), NSR (20.2.72 NMAC), NOI (20.2.73 NMAC) and PSD (20.2.74 NMAC) applicants must determine if they are subject to Title V permitting and/or PSD permitting for green house gas (GHG) emissions. GHG emissions are the sum of the aggregate group of six green house gases that include carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). There are two thresholds that must be computed to determine applicability. The first threshold is the sum of GHG mass emissions in TPY. GHG mass emissions are the sum of the total annual tons of green house gases without adjusting with the GWPs. The second threshold is the sum of CO_2 equivalent (CO_2e) emissions in TPY GHG. CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its global warming potential (GWP) found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.

Green House Gas TV and PSD Applicability Determination:

✔ **Notice of Intent Sources** (20.2.73 NMAC): By checking this box and certifying this application the applicant certifies that the facility, based upon the quantity of stack emissions, including start up, shut down, and maintenance emissions, is not subject to 20.2.70 NMAC or 20.2.74 NMAC for Green House Gas (GHG) Emissions. The Department may request the emissions calculations and other documents supporting this determination.

Minor NSR (20.2.72 NMAC), PSD Major (20.2.74 NMAC), and Title V (20.2.70 NMAC) sources must complete the steps outlined below to determine GHG TV and/or PSD applicability.

1. Calculate existing mass GHG and CO_2e emissions from your source. For PSD purposes, if this is a modification to an existing source, you must also calculate the increase in mass GHG and CO_2e emissions due to the modification. Start up, shut down, and maintenance emissions must be included.
2. See Tables 1 and 2 below and compare your mass GHG and CO_2e emissions to the appropriate category for your source.
3. If your source meets all of the criteria within a category, then you must obtain a PSD permit and/or a Title V permit for green house gas emissions.
4. If this is a GHG Major source with an existing BACT or if this is a permit application for a PSD or Title V permit with GHG above the thresholds in Tables 1 or 2, include the emissions calculations and supporting documents in the appropriate sections of this application unless instructed otherwise in Tables 1 or 2. Report GHG mass and CO_2e emissions in Table 2-P of this application unless instructed otherwise in Tables 1 or 2. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).

NSR (20.2.72 NMAC), PSD Major (20.2.74 NMAC), and Title V (20.2.70 NMAC): Based upon the GHG applicability criteria in this section the applicant certifies that the source is (check all that apply):

✔ Title V Minor and PSD Minor for GHG Emissions [The Department may request the emissions calculations and other documents supporting this determination.]

☐ Title V Major for GHG Emissions

☐ PSD Major for GHG Emissions

Section 23: Certification

Company Name: New Mexico Copper Corporation

I, JENS DEICHMANN, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 21 day of FEBRUARY, 2013, upon my oath or affirmation, before a notary of the State of NEW MEXICO.

*Signature

21 FEBRUARY 2013
Date

JENS DEICHMANN
Printed Name

PROJECT MANAGER
Title

Scribed and sworn before me on this 21 day of February, 2013.

My authorization as a notary of the State of New Mexico expires on the 27th day of February, 2016.

Katharyn Emmer
Notary's Signature

Feb 21, 2013
Date

Katharyn Emmer
Notary's Printed Name

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.

OFFICIAL SEAL
Katharyn Emmer
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 2-27-2016