August 2010

ACME MINING INC.

DEEP MINE

Best Management Practices Plan for the Control of Fugitive Dust

Reference Number: BMP Version 1.0

ACME MINING COMPANY INC.

Foreword

This Best Management Practices Plan documents the control of fugitive dust at the Acme Mining Company Inc. Deep Mine operations in Miningtown, Ontario (the Facility) and has been prepared in accordance with Appendix E (Technical Bulletin - Review of Approaches to Manage Industrial Fugitive Dust Sources) of the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (Ontario Ministry of the Environment 2009) and meets the requirements of Section 7.0 of Certificate of Approval No. 1234-567ABC issued on May 1, 2009.

This document updates and replaces all previous versions of fugitive dust control plans for the Facility issued prior to and including August 2010.

As operations change and new fugitive dust sources are added to the Facility, this Plan will be updated as required. In order to maintain version control all pages in the Plan have been dated and documented with a version number. This Plan is Version 1.0. The version number will change if the entire report is reissued; if individual pages are provided to update small portions of the Plan then they will be issued with a .X subversion number and the updated pages will be listed on the following Version Control Page.

Version Control

Version	Date	Description of Changes	Updated Pages	Approved By Job Title	Approved By Sign Off
1.0	June 2010	Original	N/A	Mark Miner Environmental Coordinator	*Mark Miner*

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1.0 INTRODUCTION

The purpose of this Plan is to document the Best Management Practices (BMPs) for the control of fugitive dust emissions from ACME Mining Inc.'s (ACME) Deep Mine (the Facility) and outlines the decision making process that was used to develop these BMPs. This Plan was prepared in accordance with Appendix E (Technical Bulletin - Review of Approaches to Manage Industrial Fugitive Dust Sources) of the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (January 2004) and meets the requirements of Section 7.0 of Certificate of Approval No. 1234-567ABC issued on May 1, 2009.

> ***7.0 FUGITIVE DUST CONTROL***
> *7.1 The Company shall develop in consultation with the District Manager and acceptable to the Director, a Best Management Practices Plan for the control of fugitive dust emissions. This Best Management Practices Plan shall include, but not be limited to:*
>
> *(1) identification of the main sources of fugitive dust emissions such as:*
> *(a) on-site traffic;*
> *(b) paved roads/areas;*
> *(c) unpaved roads/areas;*
> *(d) material stock piles;*
> *(e) loading/unloading areas and loading/unloading techniques;*
> *(f) material spills;*
> *(g) material conveyance systems;*
> *(h) exposed openings in process and storage buildings; and*
> *(i) general work areas.*
>
> *(2) potential causes for high dust emissions and opacity resulting from these sources;*
>
> *(3) preventative and control measures in place or under development to minimize the likelihood of high dust emissions and opacity from the sources of fugitive dust emissions identified above. Details of the preventative and control measures shall include:*
> *(a) a description of the control equipment to be installed;*
> *(b) a description of the preventative procedures to be implemented; and/or*
> *(c) the frequency of occurrence of periodic preventative activities, including material application rates, as applicable.*
>
> *(4) an implementation schedule for the Best Management Practices Plan, including training of facility personnel;*
>
> *(5) inspection and maintenance procedures and monitoring initiatives to ensure effective implementation of the preventative and control measures; and*
>
> *(6) a list of all Ministry comments received, if any, on the development of the Best Management Practices Plan, and a description of how each Ministry comment was addressed in the Best Management Practices Plan.*
>
> *7.2. The Company shall submit the Best Management Practices Plan to the Director and the District Manager not later than six months after the date of this Certificate.*

(1) The Director may not accept the Best Management Practices Plan if the minimum requirements described in Condition No. 7.1 were not included in the Best Management Practices Plan.

(2) If the Best Management Practices Plan is not accepted by the Director, the Company shall submit a Best Management Practices Plan acceptable to the Director not later than nine months after the date of this Certificate;

7.3. Upon acceptance of the Best Management Practices Plan by the Director, the Company shall immediately implement the Best Management Practices Plan for the control of fugitive dust emissions to provide effective dust suppression measures to any potential sources of fugitive dust emissions resulting from the operation of the Facility.

Documentation Requirements - Best Management Practices Plan
7.4. The Company shall record, in a log book, each time a specific preventative and control measure described in the Best Management Practices Plan is implemented. The Company shall record, as a minimum:

(1) the date when each emission control measure is installed, including a description of the control measure;

(2) the date when each new preventative measure or operating procedure to minimize emissions is implemented, including
a description of the preventative measure or operating procedure; and

(3) the date, time of commencement, and time of completion of each periodic activity conducted to minimize emissions, including a description of the preventative measure/procedure and the name of the individual performing the periodic activity.

This Plan will:

- identify the sources of fugitive dust emissions associated with the Facility;
- review the composition and size distribution of the fugitive dust particulate including an analysis of the metals composition of the road dust;
- describe how fugitive dust can be controlled from each significant source and describe the BMPs in place at the Facility;
- contain a schedule by which the Plan will be implemented;
- describe how the Plan will be implemented, including the training of personnel;
- describe inspection and maintenance procedures;
- describe methods of monitoring and record-keeping to verify and document ongoing compliance with the Plan.

For ease of implementation and to promote clarity, this Plan follows the following structure:

- Section 2 provides a brief description of the Facility.

- Section 3 documents the BMPs that are in place at the Facility and the decision making process used to develop these BMPs This section follows the Plan Do Check and Act (PDCA) cycle according to ISO guidelines. The “Plan” section includes identification and characterization of the emission sources and existing BMPs at the Facility. The “Do” section includes a schedule for implementation of the proposed improvements. The “Check” section includes a description of monitoring procedures and a recordkeeping system. The “Act” section includes guidelines for periodic review of the BMPs in order to promote its continuous improvement.

Ministry comments pertaining to the development and maintenance of this Plan are included in Appendix A.

2.0 FACILITY DESCRIPTION

ACME Mining Company Inc. operates an underground mining facility, known as the Deep Mine, located at 123 Mine Road in Miningtown, Ontario (the Facility). Table 1 presents general information about the Facility relevant to this Plan.

Table 1: Facility Description

Facility:	Deep Mine
Location:	123 Mine Road, Miningtown, Ontario
Area occupied:	± 16 ha
Main activities / equipment used:	Underground mining facility, comprising of: material handling (loading / unloading) / loaders, conveyors material transport / haul trucks material processing / crushing material storage (stockpiles) / loaders
Production:	Up to 325,000 tonnes/year of ore
Nearest sensitive receptors (distance / direction):	R1 – Residence (125 m / North) R2 – Residence (130 m / West)
Predominant wind direction:	NW

Figure 1 is a site plan showing the fugitive dust sources present onsite and the location of nearest receptors.

3.0 RESPONSIBILITIES

The following identifies the responsibilities held by each of the employment levels at the Facility as they pertain to this Plan.

3.1 Senior Management Representative: *Mine Manager*

The Senior Management Representative, or designate, is responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility; and
- ensuring the required resources are in place to execute the plan.

3.2 Accountable Site Representative: *Superintendent – Production*

The Accountable Site Representative, or designate, is responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility;
- scheduling and coordinating the implementation of fugitive dust control measures;
- maintaining documentation of schedules and logs; and
- ensuring the training of site personnel and contractors on the plan and best management practices to be implemented.

3.3 Unit Operations Supervisor: *Supervisor – Production*

The Unit Operations Supervisor is responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility;
- implementing fugitive dust control measures; and
- completing dust control logs.

3.4 Site Personnel and Contractors

All Site Personnel and Contractors are responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility; and
- following the dust control procedures that are currently in place.

4.0 FUGITIVE DUST EMISSIONS BEST MANAGEMENT PRACTICES PLAN

This section describes the fugitive dust control measures that are implemented at the Facility and the decision making process that has been used in the BMP development for the Facility. This section follows the Plan Do Check and Act (PDCA) cycle according to ISO guideline as follows:

- Section 4.1 **PLAN** - identifies and characterizes the emission sources and BMPs at the Facility.
- Section 4.2 **DO** - documents the schedule for implementation of the proposed improvements.
- Section 4.3 **CHECK** - describes the monitoring procedures and a recordkeeping system.
- Section 4.4 **ACT** - describes the BMP review and update procedures in order to promote its continuous improvement.

4.1 PLAN – Identification and Classification of Fugitive Dust Emission Sources

4.1.1 Identification of the Sources of Fugitive Dust Emissions

Fugitive dust emissions occur due to mechanical disturbances of granular materials exposed to the air. Dust generated from these open sources is termed “fugitive” because it is not discharged to the atmosphere in a confined flow stream, such as in an exhaust pipe or stack (USEPA 1995).

The mechanical disturbance may be equipment movement, the wind or both. Therefore, some fugitive dust emissions occur and/or are intensified by equipment use, while others, i.e. wind erosion emissions, are independent of equipment use.

The main factors affecting the amount of fugitive dust emitted from a source include characteristics of the granular material being disturbed (i.e. particulate size distribution, density and moisture) and intensity and frequency of the mechanical disturbance (i.e. wind conditions and/or equipment use conditions). Precipitation and evaporation conditions can affect the moisture of the granular material being disturbed and, therefore, have an indirect effect on the amount of fugitive dust emitted.

Once dust is emitted, its travelling distance from the source is affected by various parameters. Namely climatic conditions, specifically wind speed, wind direction and precipitation, and particle size distribution. Higher wind speeds increase the distance travelled while precipitation can accelerate its deposition. Finer particulates can travel longer before settling and, therefore, deserve major concern.

Table 2 presents a summary of the main types of fugitive dust sources existing at the Facility, as well as the potential causes for high dust emissions and opacity resulting from these sources.

Table 2: Types of Fugitive Dust Emissions at the Facility and Potential Causes for High Emissions

Identification of Sources of Fugitive Dust Emissions				Potential Causes for High Emissions and Opacity from Each Source (Parameters/Conditions)
Source Category	**Source Description**	**Source IDs**	**Source Location**	
Paved Roads	Sections of onsite roads that are paved	P1, P2, P3	Passenger vehicle entrance	- Number of vehicles / large - Weight of vehicles / heavy - Silt content / high - Wind speed / high
Unpaved Roads	Sections of onsite roads that are unpaved	UP1 – UP8	Throughout the site	- Number of vehicles / large - Weight of vehicles / heavy - Silt content / high - Moisture content / dry - Wind speed / high
Material Processing	Crusher	CR	West side of site	- Moisture content / dry - Material processing rate / high - Wind speed / high
Material Handling / Storage	Loading / unloading materials from stockpiles	SS, COS	- Sand stockpile by backfill plant - Crushed ore stockpile near crusher	- Moisture content / dry - Silt content on the stockpile surface / high - Material size / fine - Material transfer rate / high - Material drop height / high - Wind speed / high

4.1.2 Fugitive Dust Characterization

Fugitive dust sampling was conducted on the Facility roadways on April 12, 2010. A technical memo outlining the sampling procedure and showing the full results of the sampling is included in Appendix B.

The following tables show a comparison between the Facility's road dust and typical metals concentrations in Ontario identified in the literature review document (Golder 2010).

The maximum silt content for the Facility's unpaved roads is slightly above the mean value for Ontario mine sites, however, it is well below the maximum. For paved roads, the maximum Facility silt content is below the mean value for Ontario mine sites. For the metals concentrations, all the Facility's maximum concentrations are around the mean value for Ontario mine sites.

Table 3: Deep Mine Road Dust Sampling Silt Content Analysis Results

Silt Content	DEEP MINE SAMPLING RESULTS		ONTARIO MINING SITES					
	Unpaved Roads	Paved Roads	Unpaved Roads			Paved Roads		
	Maximum	Maximum	Maximum	Minimum	Mean	Maximum	Minimum	Mean
(%)	11.12	3.03	36.80	0.10	9.14	35.60	0.72	3.55
(g/m^2)	45.25	0.10	282.00	1.21	34.30	18.85	0.00	0.18

Table 4: Deep Mine Road Dust Sampling Metals Analysis Results

METAL	DEEP MINE SAMPLING RESULTS		ONTARIO STUDIES	ONTARIO MINING SITES					
	Unpaved Roads (µg/g)	Paved Roads (µg/g)	Ontario Typical Range[1] (µg/g)	Unpaved Roads (µg/g)			Paved Roads (µg/g)		
	Maximum	Maximum	98th perc	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Aluminum	9500	5000	30000	64000	179	10135	15900	718	4870
Antimony	6.02	8.00	0.43	210	0.5	4.95	88.7	0.41	8.45
Arsenic	88.6	63.20	17	34000	0.5	89.7	1140	2.8	64.05
Barium	50.8	45.2	180	580	1.2	51.3	173	5.45	46.6
Beryllium	ND	ND	1.1	1	0.24	0.5	7.1	0.4	0.5
Bismuth	2.87	12.4	—	116	0.54	3	192	1.2	17.5
Boron	6.20	4.2	30	35.8	1	5.8	16	1	3.8
Cadmium	0.75	1.03	0.84	16.6	0.05	1.29	28.6	0.4	1.65
Calcium	8600	3180	58000	72000	100	9400	7240	513	3220
Cerium	21.35	18.50	—	153	0.81	24.65	52.7	5.32	22
Cesium	ND	ND	—	1.5	0.49	0.74	0.78	0.43	0.57
Chromium	86.53	75.63	62	410	1.5	90.2	418	11.7	81.5
Cobalt	115	295	17	4950	2.29	130	10400	35.6	382

METAL	DEEP MINE SAMPLING RESULTS		ONTARIO STUDIES	ONTARIO MINING SITES					
	Unpaved Roads (µg/g)	Paved Roads (µg/g)	Ontario Typical Range[1] (µg/g)	Unpaved Roads (µg/g)			Paved Roads (µg/g)		
	Maximum	Maximum	98th perc	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Copper	1200	1635	65	50300	49.1	1570	174000	200	11700
Europium	ND	ND	—	1.9	0.49	0.64	0.55	0.49	0.55
Gallium	4.7	4.1	—	7.88	0.66	4.4	6.7	0.61	3.9
Iron	56323	48623	35000	143000	1140	63500	177000	13200	50100
Lanthanum	8.9	6.3	—	85.3	2.7	11.6	29.9	2.5	10
Lead	56	145	98	721	2.3	41.8	993	14.4	131
Lithium	12.8	7.6	—	45	4.2	12.5	13	5.9	7
Magnesium	6930	3900	20000	47000	125	7080	6940	502	4020
Manganese	325	206	2200	2300	5.04	310	1180	36	195
Mercury	0.18	0.06	0.18	0.758	0.049	0.24	1.2	0.04	0.455
Molybdenum	3.6	7.6	1	25.2	0.55	4.45	72	0.69	8.34
Nickel	450	368	38	488000	14.5	1580	429000	133	10400
Niobium	ND	ND	—	—	—	—	4.4	0.72	2.56
Phosphorus	456	420	—	1000	92	360	833	68	340
Rubidium	8.6	7.4	—	37.4	1.2	10	18.5	0.99	6.4
Scandium	3.8	3.4	—	8.38	0.59	3.2	3.9	0.86	2.6
Selenium	9.2	13.6	1.3	89.9	0.5	7.7	154	1.2	25.55
Silver	3.6	5.8	0.33	131	0.052	1.47	139	0.4	9.06
Strontium	26	18	78	184	2.6	55.2	79.5	4	23
Thallium	ND	ND	0.81	0.59	0.59	0.59	—	—	—
Thorium	5.3	4.8	—	22.4	1.4	7.4	21.3	1.7	5.02

METAL	DEEP MINE SAMPLING RESULTS		ONTARIO STUDIES	ONTARIO MINING SITES					
	Unpaved Roads (µg/g)	Paved Roads (µg/g)	Ontario Typical Range[1] (µg/g)	Unpaved Roads (µg/g)			Paved Roads (µg/g)		
	Maximum	Maximum	98th perc	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Tin	9.4	12.8	—	230	0.5	7.72	327	1.6	26
Titanium	865	925	5200	3400	18.2	870	1180	124	708
Tungsten	6.8	9.5	—	12.5	0.57	3.2	104	0.49	12
Uranium	0.63	0.75	2.1	6.8	0.49	0.965	1.6	0.71	1.1
Vanadium	49	38.2	77	220	0.5	44.7	55	6.69	32.35
Yttrium	7.23	6.85	—	52.2	1.1	6.725	10	0.72	4.45
Zinc	218	304	140	4400	5	220	1250	39.1	282
Zirconium	3.24	3.8	—	16.5	0.58	4.9	15.6	1.3	4.45

Notes:
[1] Ontario Ministry of the Environment and Energy 1993
— no data
ND not detectable

4.1.3 Fugitive Dust Best Management Practices

Control measures to reduce fugitive dust emissions should take into account the sources of the dust emission, the dispersion conditions and the location of sensitive areas in order to avoid relevant impacts of dust emissions on receptors.

Control measures intend to affect one or more factors affecting the generation and/or dispersion of fugitive dust emissions. These control measures can be classified as follows;

- **Preventative Procedure**: Measure pertaining to the design and installation of structures and the operating procedures which are implemented on a regular basis in order to prevent the generation of dust and/or the dispersion of dust emitted reaching sensitive areas.
- **Reactive Control Measures**: Measures which are implemented in the event of unexpected circumstances which can lead to the generation of dust and/or the dispersion of dust emitted reaching sensitive areas.

Table 5 presents Preventative Procedures and Reactive Control Measures for fugitive dust emissions that are associated with the Deep Mine.

Table 5: Description of Preventative Procedures and Control Measures for Fugitive Dust Emissions Existing and Under Development at the Facility

Emission Source	Preventative Procedure/ Control Measure	Description	Frequency
Unpaved roads	Watering	The Facility currently employs a water truck. Road segments in close proximity to the property line should be focused on.	Roadways should be watered within 12 hours of any previous wettings (i.e. rain or truck) on hot dry days and within 48 hours on cooler humid days or as visually necessary, whichever is more frequent.
Paved roads	Vacuuming	The Facility currently employs a vacuum truck.	Roadways are vacuumed twice per week.
Stockpiles	Stockpile orientation	Orient stockpile so that the following are considered: - the length is parallel with prevailing winds - reduce exposed surface area - take advantage of natural wind breaks	At initial placement
	Maintain minimum drop height	Loader is to unload material with its bucket as close to the pile as possible	At all times

Emission Source	Preventative Procedure/ Control Measure	Description	Frequency
Crusher	Three-walled enclosure	Walls were constructed along the N, W and E sides of the crusher	NA
	Equipment maintenance	The equipment is on a routine maintenance schedule	A maintenance inspection is to be performed monthly, any repairs made immediately

Each fugitive dust source at the Facility was assessed using the risk management tool described in the guidance document (CEMI 2010) to assess if the BMPs that are in place adequately manage the risk associated with each source. See Appendix C for the risk factors used in the ranking process. The following table identifies all fugitive dust sources with their respective relative risk score for the Facility.

Table 6: Fugitive Dust Sources and Associated Relative Risk Scores

Source ID	Source Description	BMP (if any)	Relative Risk Score	Relative Risk Level
CR	Crusher	Three-walled enclosure, monthly maintenance inspection	65	Medium
UP6	Unpaved road to crushed ore stockpile	Watering	60	Medium
UP7	Unpaved road to crushed ore stockpile	Watering	60	Medium
UP2	Unpaved road to backfill plant	Watering	56	Medium
UP3	Unpaved road to backfill plant	Watering	56	Medium
UP4	Unpaved road to sand stockpile	Watering	56	Medium
UP5	Unpaved road to backfill plant	Watering	56	Medium
UP1	Unpaved road (industrial vehicle entrance)	Watering	54	Medium
UP8	Unpaved road from hoist to crusher	Watering	52	Medium
SS	Sand stockpile	Drop heights	45	Low
COS	Crushed ore stockpile	Drop heights	44	Low
P1	Paved road (passenger vehicle entrance)	Vacuuming	29	Low
P2	Paved road to parking lot	Vacuuming	29	Low
P3	Paved road to parking lot	Vacuuming	29	Low

There are no sources that are still considered to be "high" risk after the implementation of the BMPs therefore it is assumed that the BMPs in place adequately manage the risk associated with each fugitive dust source.

4.2 DO – Implementation Schedule for the BMP Plan

All BMPs listed in Table 5 have already been implemented at the Facility.

All dust generating work performed onsite, whether it is being completed by ACME Mining or under contractual agreements, must conform to the requirements of this Plan.

Table 7 presents the process for the implementation of any new BMP for control of fugitive dust emissions at the Facility, as well as the corresponding start-up checklist that is to be completed. The purpose of the checklists is to ensure that the new emission source will be implemented following that same dust control procedures of the current sources at the Facility. Examples of the checklists are presented in Appendix D.

Table 7: Implementation Process for New Emission Sources

New Emission Source	Examples	Start-up Checklists
Paved roadways	New stretch of paved roadway	Paved Roadway Start-up Checklist
Unpaved roadways	New stretch of unpaved roadway	Unpaved Roadway Start-up Checklist
Material processing	New crushing unit, new screening unit	Material Processing Start-up Checklist
Material handling / storage	New loading/unloading procedure/activity, new conveyor transfer point, new storage pile location	Material Handling/Storage Start-up Checklist

4.2.1 Training

All site personnel and contractors are to receive training on the requirements of this Plan. Training will be incorporated into the Facility indoctrination that is required prior to working on the property. These training records will be kept with all other training records in the training department.

4.3 CHECK – Inspection, Maintenance and Documentation

An inspection of the conformity with the BMPs will be documented weekly using the Dust Control Inspection Form (see Appendix E for an example form). Each dust emission source type has a corresponding log sheet (see Appendix F) to record all dust control activity pertaining to those sources.

In the event of a non-conformance, the inspector will add the incident to the Non-Conformance Log (see Appendix G). Corrective action is to be taken to eliminate the causes of the non-conformance. It is expected that all deficiencies identified in inspections be addressed immediately. Reviews of the Non-Conformance Logs will be done quarterly as part of the BMP continuous improvement program, explained in more detail in Section 4.4.

Table 8 provides a summary of the inspections that take place at the site under this Plan and the inspection frequency.

Table 8: Inspection Frequency Summary

Inspection Type	Frequency
Dust Control Inspection Form	Weekly
Equipment Maintenance Inspection Form	Monthly
Activity Logs	Whenever activity occurs
Non-Conformance Log	Whenever a non-conformance occurs

Table 9 presents all the inspection and maintenance procedures in place and the respective documentation to support ongoing conformity with preventative and control measures described in the Table 5 for each emission type.

Table 9: Inspection Documentation for the Deep Mine Organized by Emission Source Type

Dust Emission Source Type	Documentation	Document Control/Record Keeping
Paved Roadways	Dust Control Inspection Form	7 years
	Paved Roadways Vacuum Log	
	Non-Conformance Log	
Unpaved Roadways	Dust Control Inspection Form	7 years
	Unpaved Roadway Watering Log	
	Non-Conformance Log	
Material Handling / Storage	Dust Control Inspection Form	7 years
	Material Handling Activity Log	
	Non-Conformance Log	
Material Processing	Dust Control Inspection Form	7 years
	Equipment Maintenance Inspection Form	
	Material Processing Activity Log	
	Non-Conformance Log	

As part of recordkeeping procedures the above information should be recorded in electronic files and hard copies, for a minimum period of seven years. The Production Superintendent is responsible for recordkeeping the information listed above and copies of all documents are kept in the "*Best Management Practices Plan for Deep Mine Documents Binder*" which is kept on the red shelving unit in the Production Superintendent's office.

4.4 ACT – BMP Plan Review and Continuous Improvement

Inspections and monitoring procedures will assist ACME Mining personnel with the maintenance of an effective BMP Plan. The BMP Plan should be monitored and updated, as follows:

- when there are significant changes in the fugitive dust emissions sources;
- periodically, every five years (minimum);
- when there are verified complaints associated with fugitive dust emissions from the Facility; and
- when there are visible dust emissions occurring more frequently and/or at a higher rate (excluding seasonal conditions).

Review of the BMP Plan is intended to evaluate the effectiveness of the dust control practices and focus on the identification of improvement opportunities that can reduce the risk of complaints related to fugitive dust emissions.

5.0 REFERENCES

Centre for Excellence in Mining Innovation. 2010. Guide to the Preparation of a Best Management Practices Plan for the Control of Fugitive Dust for the Ontario Mining Section. Version 1.0, August 2010.

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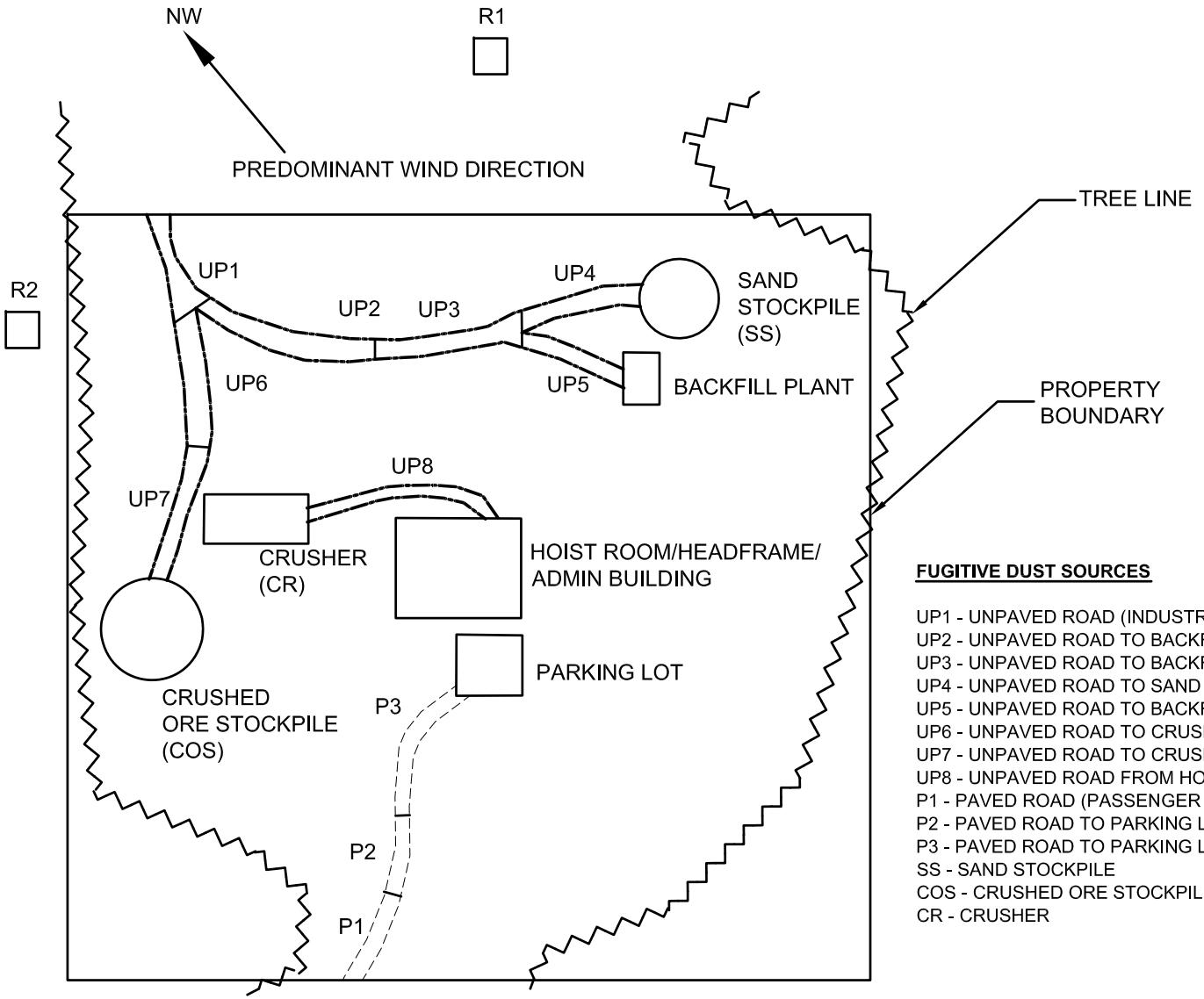

FUGITIVE DUST SOURCES

UP1 - UNPAVED ROAD (INDUSTRIAL VEHICLE ENTRANCE)
UP2 - UNPAVED ROAD TO BACKFILL PLANT
UP3 - UNPAVED ROAD TO BACKFILL PLANT
UP4 - UNPAVED ROAD TO SAND STOCKPILE
UP5 - UNPAVED ROAD TO BACKFILL PLANT
UP6 - UNPAVED ROAD TO CRUSHED ORE STOCKPILE
UP7 - UNPAVED ROAD TO CRUSHED ORE STOCKPILE
UP8 - UNPAVED ROAD FROM HOIST TO CRUSHER
P1 - PAVED ROAD (PASSENGER VEHICLE ENTRANCE)
P2 - PAVED ROAD TO PARKING LOT
P3 - PAVED ROAD TO PARKING LOT
SS - SAND STOCKPILE
COS - CRUSHED ORE STOCKPILE
CR - CRUSHER

FIGURE 1

REVIEW	CHECK	CADD	DESIGN	REV.	SCALE	FILE No.	PROJECT No.
					NTS		

TITLE

FUGITIVE DUST SOURCES LOCATION PLAN

PROJECT

BEST MANAGEMENT PRACTICES PLAN FOR
THE CONTROL OF FUGITIVE DUST
ACME MINING INC.
DEEP MINE
BMP VERSION 1.0

ACME MINING COMPANY INC.

APPENDIX A

Ministry Comments

APPENDIX A
Summary of Ministry Comments

The table provides the list of Ministry comments pertaining to the creation of this document.

Date	Ministry Comment
May 2010	Ministry comments on the Draft included: - Please provide a figure showing the location of the fugitive dust sources - Please provide examples of the inspection forms and logs

n:\active\2009\1190 sudbury\1192\09-1192-0105 cemi fugitive dust sudbury\reporting\draft\acme example\appendix a.docx

APPENDIX B

Road Dust Sampling Technical Memo

August 2010

ACME MINING INC.

DEEP MINE

Road Dust Sampling Technical Memorandum

This is document is provided as a placeholder only.

Reference Number: RDS 1.0

ACME MINING COMPANY INC.

APPENDIX C

Fugitive Dust Source Risk Ranking

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Fugitive Dust Risk Management Tool

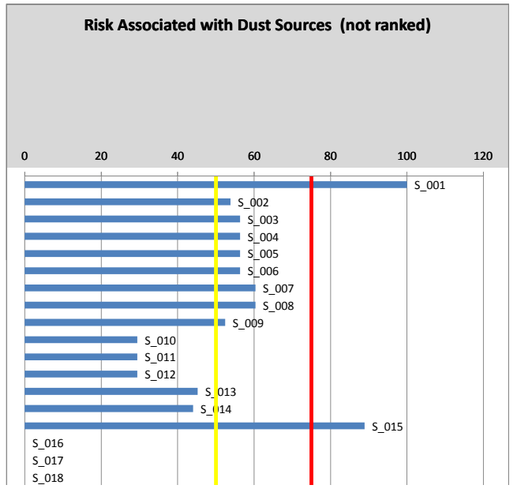
Source	Path	Path	Source	Receptor	Path / Receptor	Path	Source	Source	Source	Source

Step 1 - Calculation of risks associated with fugitive dust sources

	Cells to be populated
	Drop-down menu
	Automatically

100	Max:
75	Red: >
50	Yellow: >

		Risk Factors											
		1	2	3	4	5	6	7	8	9	10	11	Risk
Source ID Number	Description of the structure / equipment	Frequency of process / activity that generates fugitive dust:	Position of the source related to sensitive areas (e.g.: communities, working areas):	Predominant wind direction is from the source to the closest sensible area?	Relative amount of visible dust generated in the process / activity:	Dust composition	Dust size range (higher mass percentage)	Is there some wind barrier (e.g.: trees, buldings, landscape) which can prevent the emissions from this source to reach the closest sensitive area?	Is there some measure applied on regular basis to prevent dust emission from this source (preventative)?	Is there some measure applied to this source to reduce dust emission once it occur (reactive)?	Is there some monitoring procedure applied to this source related to fugitive dust control?	Monitoring data / information trigger some control measure?	Total Normal.
S_001	WCS - Worst Case Scenario	Continuous	Close	Yes	High	Metals	Fine	No	No	No	No	No	100
S_002	UP1 – unpaved road (industrial vehicle entrance)	Continuous	Close	No	High	Metals	Fine	No	Yes	No	No	No	54
S_003	UP2 – unpaved road to backfill plant	Intermitent	Close	Yes	High	Metals	Medium	No	Yes	No	No	No	56
S_004	UP3 – unpaved road to backfill plant	Intermitent	Close	Yes	High	Metals	Medium	No	Yes	No	No	No	56
S_005	UP4 – unpaved road to sand stockpile	Intermitent	Close	Yes	High	Metals	Medium	No	Yes	No	No	No	56
S_006	UP5 – unpaved road to backfill plant	Intermitent	Close	Yes	High	Metals	Medium	No	Yes	No	No	No	56
S_007	UP6 – unpaved road to crushed ore stockpile	Continuous	Close	Yes	High	Metals	Fine	Yes	Yes	No	No	No	60
S_008	UP7 – unpaved road to crushed ore stockpile	Continuous	Close	Yes	High	Metals	Fine	Yes	Yes	No	No	No	60
S_009	UP8 – unpaved road from hoist to crusher	Continuous	Medium	Yes	High	Metals	Medium	No	Yes	No	No	No	52
S_010	P1 – paved road (passenger vehicle entrance)	Intermitent	Medium	Yes	Low	No metals	Medium	No	Yes	No	No	No	29
S_011	P2 – paved road to parking lot	Intermitent	Medium	Yes	Low	No metals	Medium	No	Yes	No	No	No	29
S_012	P3 – paved road to parking lot	Intermitent	Medium	Yes	Low	No metals	Medium	No	Yes	No	No	No	29
S_013	SS – sand stockpile	Continuous	Close	Yes	High	No metals	Fine	No	Yes	Yes	No	No	45
S_014	COS – crushed ore stockpile	Continuous	Close	Yes	High	Metals	Medium	No	Yes	Yes	No	No	44
S_015	CR – crusher	Continuous	Close	Yes	High	Metals	Medium	No	Yes	No	No	No	89



APPENDIX D

Start Up Checklists

Paved Roadways
Start-up Checklist

Roadway Characteristics	
Source ID:	
Location (note proximity to the property line):	
Length:	
Surface materials:	
Anticipated volume of vehicle traffic:	
Peak traffic time:	
Anticipated vehicle speed limit:	

Special Considerations for the Control of Dust Emissions

Implementation	Yes
Has this roadway been added to the vacuum truck schedule?	
Has this roadway been added to the inspection protocol?	

Answering "Yes" to the implementation questions documents compliance with the Best Management Practice Plan for Control of Fugitive Dust Emissions.

Name of Plant Contact:		**Name of Supervisor:**	
Signature:		**Signature:**	
Date:		**Date:**	

Unpaved Roadways
Start-up Checklist

Roadway Characteristics	
Source ID:	
Location (note proximity to the property line):	
Length:	
Surface materials:	
Anticipated volume of vehicle traffic:	
Peak traffic time:	
Anticipated vehicle speed limit:	

Special Considerations for the Control of Dust Emissions

Implementation	Yes
Has this roadway been added to the water truck schedule?	
Has this roadway been added to the inspection protocol?	

Answering "Yes" to the implementation questions documents compliance with the Best Management Practice Plan for Control of Fugitive Dust Emissions.

Name of Plant Contact:		**Name of Supervisor:**	
Signature:		**Signature:**	
Date:		**Date:**	

Material Handling / Storage Start-up Checklist

Unit Process Characteristics	
Source ID:	
Operation type:	
Location:	
Material being handled:	
Material handling rate:	
Peak handling time:	

Special Considerations for the Control of Dust Emissions

Implementation	Yes
Has the storgae pile been oriented with prevailings winds?	
Has the storage pile been oriented to reduce exposed surface area?	
Has the storage pile been placed to take advantage of natural wind breaks?	
Have material drop heights been discussed with the operators?	
Has this unit been added to the inspection logs?	

Answering "Yes" to the implementation questions documents compliance with the Best Management Practice Plan for Control of Fugitive Dust Emissions.

Name of Plant Contact:		**Name of Supervisor:**	
Signature:		**Signature:**	
Date:		**Date:**	

Material Processing Start-up Checklist

Unit Process Characteristics	
Source ID:	
Operation type:	
Location:	
Material being processed:	
Material processing rate:	
Peak processing time:	

Special Considerations for the Control of Dust Emissions

Implementation	Yes
Have material drop heights been minimized as much as possible?	
Has this unit been added to the inspection logs?	

Answering "Yes" to the implementation questions documents compliance with the Best Management Practice Plan for Control of Fugitive Dust Emissions.

Name of Plant Contact:		**Name of Supervisor:**	
Signature:		**Signature:**	
Date:		**Date:**	

APPENDIX E

Dust Control Inspection Form

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Dust Control Weekly Inspection Form

Date:
Inspector Name:

Paved Roadways				
Please check all segments that were inspected: PR1 ____ PR2 ____ PR3 ____				
If some segments were not inspected, pleased indicate below which segment and why it was not inspected.				
Inspection Items	**Response**	**Requirement**	**Conformance (Y or N)**	**Description of Non-Conformance**
Is visible dust observed from any section of roadway?		N		
Are appropriate load sizes maintained on haul vehicles?		Y		
Are roadways well maintained? (ie good housekeeping)		Y		
Has the vacuum log been maintained?		Y		
Has the non-conformance log been maintained?		Y		
Have previous non-conformances been rectified?		Y		

Unpaved Roadways				
Please check all segments that were inspected: UP1 ____ UP2 ____ UP3 ____ UP4 ____ UP5 ____ UP6 ____ UP7 ____ UP8 ____				
If some segments were not inspected, pleased indicate below which segment and why it was not inspected.				
Inspection Items	**Response**	**Requirement**	**Conformance (Y or N)**	**Description of Non-Conformance**
Is visible dust observed from any section of roadway?		N		
Are appropriate load sizes maintained on haul vehicles?		Y		
Are roadways well maintained? (ie good housekeeping)		Y		
Has the watering log been maintained?		Y		
Has the non-conformance log been maintained?		Y		
Have previous non-conformances been rectified?		Y		

CME MINING COMPANY INC.

Dust Control Weekly Inspection Form

Date:
Inspector Name:

Material Handling / Storage				
Please check all areas that were inspected: SS ____ COS ____				
If some areas were not inspected, pleased indicate below which area and why it was not inspected.				
Inspection Items	**Response**	**Requirement**	**Conformance (Y or N)**	**Description of Non-Conformance**
Is visible dust observed from any material handling location?		N		
Are low drop heights maintained?		Y		
Are material handling locations well maintained? (ie good housekeeping)		Y		
Has the activity log been maintained?		Y		
Has the non-conformance log been maintained?		Y		
Have previous non-conformances been rectified?		Y		

Material Processing				
Please check all areas that were inspected: CR ____				
If some areas were not inspected, pleased indicate below which area and why it was not inspected.				
Inspection Items	**Response**	**Requirement**	**Conformance (Y or N)**	**Description of Non-Conformance**
Is visible dust observed from any location?		N		
Has the equipment been maintenance inspected within the last month?		Y		
Are storage areas well maintained? (ie good housekeeping)		Y		
Has the activity log been maintained?		Y		
Has the non-conformance log been maintained?		Y		
Have previous non-conformances been rectified?		Y		

All non-conformances must be documented in the Non-Conformance Log

Inspector Sign Off: _____

APPENDIX F

Dust Control Activity Log Sheets

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Paved Roads
Vacuum Log

Section of Roadway (Source ID)	Date	Description of Procedure (Equipment used)	Start Time	End Time	Operator Name & Company	Company Sign Off

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Unpaved Roads
Watering Log

Section of Roadway (Source ID)	Date	Description of Watering (Equipment used, amount of water applied)	Start Time	End Time	Operator Name & Company	Company Sign Off

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Material Handling / Storage
Dust Control Activity Log

Material Handling / Storage Area (Source ID)	Date	Description of Activity	Start Time	End Time	Operator Name & Company	Company Sign Off

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Material Processing
Dust Control Activity Log

Material Processing Area (Source ID)	Date	Description of Activity	Start Time	End Time	Operator Name & Company	Company Sign Off

APPENDIX G

Non-Conformance Log

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Non - Conformance Log

Date	Time	Inspector Name	Potential or Actual Non-Conformance		Cause	Action	Recommendation	Corrective Action Sign Off
			Location / Source ID	Activity / Process / Condition				