REPORT

MILLER AGGREGATES PARIS PLAINS CHURCH RD. PIT

COUNTY OF BRANT, ONTARIO

BEST MANAGEMENT PRACTICES PLAN FOR DUST

RWDI # 2204263

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SUBMITTED TO

Ken Zimmerman
Land and Asset Manager
Ken.Zimmerman@millergroup.ca
C: 647.209.4882

Megan Smythe
Planning Coordinator
Megan.Smythe@millergroup.ca
C: 437.684.4878

Miller Aggregates
281 Hillmount Road, Suite 101
Markham, ON L6C 2S3
T: 905.475.6660
F: 905.475.3852

SUBMITTED BY

Brian G. Sulley, B.A.Sc., P.Eng.
Technical Director, Principal
Brian.Sulley@rwdi.com

Maja Bokara, PGCert, EP
Project Manager
Maja.Bokara@rwdi.com

RWDI AIR Inc.
Consulting Engineers & Scientists
600 Southgate Drive
Guelph Ontario Canada N1G 4P6
T: 519.823.1311
F: 519.823.1316

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REPORT SIGNATURES

Brian G. Sulley, B.A.Sc., P.Eng.

1 INTRODUCTION

1.1 Overview

This Best Management Practice Plan ("BMPP") for dust was prepared for Miller Aggregates (the "Company") for implementation at the Paris Plains Church Road Pit (the "Pit") in the County of Brant. This plan includes dust control measures that meet and/or exceed the current industry standards. Implementation of these measures will ensure that dust is effectively controlled and impacts to neighbouring residents are minimized.

A BMPP is meant to be a living document, reflecting operational experience at the site, and shall be reviewed periodically to ensure that mitigation measures are effective. Furthermore, if the site is operating at levels below maximum capacity, the mitigation measures may be adjusted accordingly.

1.2 Components of A Best Management Practices Plan

A BMPP is a detailed document that outlines the fugitive dust sources at a given site and describes the measures that shall be used to control emissions from these sources. The BMPP is used to manage fugitive dust emissions from sources such as on-site haul routes, material processing, material handling, and wind erosion. The Ontario Ministry of the Environment, Conservation and Parks ("MECP") recommends that the BMPP be based on a process of "Plan, Do, Check Act", as described in the Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources[1]. This BMPP is designed to meet the recommendations of the MECP in a form that provides clear and concise procedures for site personnel.

1.3 Size and Composition of Fugitive Dust at Sand & Gravel Operations

Typically, the dust at a sand and gravel operation has the following characteristics:

- Primarily composed of calcium carbonate, oxides of iron, magnesium and aluminum and/or silicon;
- Fraction of dust smaller than 10 micrometres (PM10), 19-55%[2];
- Fraction of dust smaller than 2.5 micrometres (PM2.5), 3-14%[2]; and,
- Crystalline silica content of onsite material, estimated at less than 20%.

1.4 Overview of the Best Management Practices Plan

This document provides a separate section for fugitive dust sources at the Pit, including a description of each source, complete with control measures applicable to each particular source.

[1] Standards Development Branch, Local Air Quality Section, Ontario Ministry of the Environment and Climate Change (MOECC)
[2] Based on data from the AP-42 Compilation of Air Pollutant Emission Factors, published by the United States Environmental Protection Agency.

2 DEFINITIONS

2.1 Dry Conditions

Where the BMPP refers to ”dry conditions”, this is defined as a period before which there have been more than 2 consecutive days without total rainfall over 1 mm.

2.2 Precipitation

Where the BMPP refers to ”sufficient precipitation”, this is defined as:

- Greater than 1 hour of rain;
- Greater than 2 hours of drizzle.
- Shorter periods of rain or drizzle are not regarded as ”sufficient precipitation”.
- Periods of fog are not regarded as ”sufficient precipitation”.

2.3 Fugitive Dust

Where the BMPP refers to observations of “fugitive dust”, it refers to the MECP definition of fugitive dust:

> “‘Fugitive dust’ means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of any person.”

3 SITE PREPARATION & REHABILITATION

3.1 Activities Included

- Overburden removal using excavators, loaders and haul trucks.
- Berm construction using loaders, haul trucks and bulldozers.
- Rehabilitation using loaders, haul trucks and bulldozers.

3.2 Controls

- Avoid, if possible, overburden removal, berm construction and rehabilitation operations, if possible, during drier months, such as July, August, and September and during peak periods of extraction and processing of aggregates. Should these activities occur during this period, the measures identified below for dry conditions will be implemented, regardless of location and wind direction.
- During stripping, berm construction and rehabilitation, personnel shall monitor operations to ensure that visible fugitive dust does not leave the property when the following criteria are met:
  - Dry conditions are anticipated;
  - Excavation and loading activities are within 200 m of a residence or the Paris Plains Church; and
  - Winds are anticipated to be blowing towards the nearby residences or the Paris Plains Church.
- If visible fugitive dust is observed under these conditions, these operations shall be reduced, or additional mitigation measures shall be undertaken, such that visible fugitive dust is prevented from leaving the site. These additional mitigation measures could include, but are not limited to:
  - Application of water using a spray cannon mounted on the water truck.
  - If operations allow it, shifting operations to another area of the pit to reduce the potential for dust to migrate to the nearby residences or the Paris Plains Church.

4 AGGREGATE EXTRACTION

4.1 Activities Included

- Excavation of virgin aggregate at the active working face by front-end loader; and,
- Transfer of virgin aggregate to the portable crusher or haul trucks by front-end loader.

4.2 Controls

- Personnel shall monitor extraction, transfers, crushing and conveying operations to ensure that visible fugitive dust does not leave the property when the following criteria are met:
  - Extraction is occurring within 200 meters of a residence or the Paris Plains Church;
  - Winds are blowing from the operations towards nearby residences or the Paris Plains Church; and,
  - Dry conditions are anticipated (operations can proceed at full production under rainy conditions);
- If visible fugitive dust is observed blowing towards nearby residences or the Paris Plains Church, the following measures shall be implemented:
  - Water should be applied to the working face using a spray cannon mounted on the water truck, as quickly as possible.
  - Activities may need to be reduced or stopped completely if the dust cannot be mitigated.
  - If operations allow it, shifting operations to another area of the pit to reduce the potential for dust to migrate to the nearby residences or the Paris Plains Church.

5 AGGREGATE PROCESSING

5.1 Activities Included

- Crushing of virgin aggregate in the portable crusher;
- Conveying of crushed aggregate back to the main processing plant.
- Aggregate crushing, screening, washing and stockpiling at the main processing plant.
- Aggregate stockpile area and loading of trucks around the stockpiles.

5.2 Controls

- The portable crushing equipment shall be equipped with dust suppressing or collection devices (such as a water spray system). If a water spray system is used, spray bars shall be located at crushers and screen decks.
- The primary processing plant shall be equipped with dust suppressing or collection devices (such as a water spray system). If a water spray system is used, spray bars shall be located at crushers and screen decks.
- Watering rate will be set as needed to suppress visible dust.
- If the natural moisture content of the virgin aggregate is sufficiently high, watering may not be required.
- When sufficient precipitation is present, watering may not be required.
- For screenings and other high-fines materials, stackers will be kept as close to the tops of stockpiles as is feasible, to achieve a drop height of approximately 1m or less.

6 UNPAVED HAUL ROUTES

6.1 Activities Included

- Unpaved haul routes for loader traffic from working face to portable or primary plant.
- Unpaved haul routes for shipping traffic from the stockpiles to paved portion of haul route.

6.2 Controls

- Unpaved roads at the Paris Pains Pit are watered using a water truck or suitable alternative such as a water spray system. If water is used, the application of water to the unpaved roads will be dependent on weather conditions and the amount of traffic.
- During the winter months (December to March), watering shall not be conducted due to operational constraints and safety concerns as a result of cold/freezing temperatures. When temperatures are below, or predicted to fall below, 4ºC, chemical dust suppressants may be applied, or operations shall be curtailed.
- The watering system shall be designed to deliver the water evenly over the haul route surface and shall have the capacity to deploy water on all active haul routes at a rate of at least 1.5 L/m²/hour.
- Site staff will conduct visual inspections of the unpaved roads for dust emissions and the opacity of the dust emissions on a daily basis. If there is a significant amount of dust being emitted and/or the dust being emitted is of a high opacity, the water truck will be implemented.
- A speed limit of 25 km/h on all on-site roads shall be posted near the site entrance. Haul truck and highway truck operators will be directed to observe the speed limit.
- When operations are occurring within Phase 5, conveyors will be used to transport the extracted aggregate from the extraction face to the processing plant.

7 PAVED HAUL ROUTES

7.1 Activities Included

- Paved haul route for shipping traffic.

7.2 Controls

- Paved roads at the Paris Pains Pit are flushed using a water truck or swept using a wet or vacuum sweeper. The cleaning of paved roads will be dependent on weather conditions and the amount of aggregate material on the paved road surface at the Pit.
- During the winter months (December to March), flushing shall not be conducted due to operational constraints and safety concerns as a result of cold/freezing temperatures. When temperatures are below, or predicted to fall below, 4ºC, vacuum sweeping shall be employed if needed.
- A speed limit of 25 km/h on all on-site roads shall be posted near the site entrance. Haul truck and highway truck operators will be directed to observe the speed limit.
- Visual inspections of the paved roads for maintenance (i.e., fixing potholes) will be conducted on a monthly basis. Road maintenance involves placing material (i.e., asphalt, aggregates, etc.) into the potholes to level the surface of the road.

8 WIND EROSION

8.1 Activities Included

- Wind erosion may occur at disturbed areas, or at stockpiles that have relatively high silt contents, such as screenings or granular aggregate.
- Disturbed areas include the working face, areas that have been stripped but not yet extracted, and areas that have been extracted but not yet rehabilitated.
- Wind erosion of these piles will only occur when winds exceed a threshold wind speed level, which is typically on the order of 5-7 metres per second (18-25 km/h).

8.2 Controls

- The amount of disturbed area will be kept to the minimum necessary for extraction to proceed in an efficient manner. Progressive rehabilitation will be used to reduce erosion from previously extracted areas, in accordance with recommendations in Section 2: Site Preparation & Rehabilitation.
- Stockpiles of finer-grained material will be located on the eastern side of the plant area so as to be sheltered from prevailing winds by other piles.
- If visible fugitive dust associated with wind erosion of stockpiles or exposed areas is observed blowing towards nearby residences or the Paris Plains Church, water should be applied to the stockpiles and / or working face using a spray cannon mounted on the water truck, as quickly as possible.

9 EQUIPMENT SPECIFICATIONS

9.1 Activities Included

- These controls pertain to all diesel-fired off-road and stationary equipment at the site, including:
  - On-site engines used to power processing equipment.
  - Front-end loaders used for extraction and loading.
  - Bulldozers, excavators, loaders, and haul trucks used for site preparation and rehabilitation.

9.2 Controls

- At a minimum, all equipment shall meet the Tier 2 or 3 emission limits, as applicable to each size of engine, as established under the Canadian Off-Road Compression-Ignition Engine Emission Regulations.
- Should Tier 4-compliant equipment be used at the site in the future, this will only serve to further reduce potential impacts.

10 OPERATIONAL WATERING FORECASTING

10.1 Activities Included

- The decision of when to conduct watering of haul routes and stockpiles requires the operator to use observations of meteorological conditions to ensure that dust is mitigated.

10.2 Conditions Under Which Watering is Required

- The site operator should monitor local weather conditions using local weather forecasts.
- The following table provides guidance on optimal frequency at which water should be applied:

Temperature	Relative Humidity	Hours Between Watering @ 1.5 L/m²
Below 4°C	Any	Watering not recommended
4°C - 10°C	75% or less	3
	75-90%	7
	90-100%	15
	Wet Weather (e.g., rain, drizzle)	Not required
10°C – 20°C	75% or less	1.5
	75-90%	3
	90-100%	7
	Wet Weather (e.g., rain, drizzle)	Not required
Above 20°C	75% or less	1
	75-90%	1.5
	90-100%	3
	Wet Weather (e.g., rain, drizzle)	Not required

- Regardless of the criteria above, watering will be implemented immediately if dust is observed to be blowing toward nearby residences or the Paris Plains Church.
- When the temperature is below 4°C, watering is not recommended for safety reasons. Under these conditions, operations may need to be reduced, or other mitigation measures implemented.

11 ADMINISTRATION

11.1 Implementation Schedule

- All control measures should be in a state of readiness before operation of the pit commences.

11.2 Implementation Plan

- Formal training on new and existing operating procedures shall be provided to relevant new and existing staff at a minimum of once every 3 years, and in the event of changes to the BMPP.
- The company's management shall communicate the BMPP to responsible supervisors, who shall ensure personnel are following operating procedures defined in the BMPP.
- The Site Manager shall be responsible for ensuring the BMPP is followed.
- Management shall ensure the controls described in the BMPP are reviewed annually to maintain the levels of control outlined in the Air Quality Assessment, and to ensure operations will have not have a negative environmental impact on the surrounding area.
- The BMPP shall be kept on file at scale house (or with other health and safety information and procedures on site).

12 INSPECTION & MONITORING

12.1 Inspection and Maintenance

- Any dust suppressing or collection systems, such as spray bars, water trucks, or other such equipment should be inspected weekly;
- The paved and unpaved haul routes will be inspected weekly, and maintenance will be performed as soon as practicable.

12.2 Monitoring

- Weather forecasts will be checked daily, to plan for current and next-day watering needs according to the Operation Weather Forecasting procedure described in Section 10.
- Throughout the operating day, on-site personnel shall report to the site manager any observations of visible fugitive dust blowing towards nearby residences or the Paris Plains Church.
- The Site Manager or their delegate will be responsible for monitoring current conditions and weather forecasts from Environment & Climate Change Canada, to subsequently help plan for current and next day dust management measures.

12.3 Record Keeping

- Records shall be kept of when and how dust control measures are implemented and when complaints are received, if any.
- In addition, records shall also be kept of the results of all Inspection, Maintenance and Monitoring activities.

13 COMPLAINT TRACKING AND RESOLUTION

13.1 Complaint Tracking

- A sign posted at the site entrance, and on the Company website, shall include a phone number and an e-mail address for neighbours to call if they have concerns.
- The Company shall request that the local MECP office and the County of Brant notify them immediately if they receive a complaint, to allow for prompt response and follow-up.
- Complainants shall be requested to identify the location of the incident as well as the time of day that it was detected and any other information that they feel is relevant.

13.2 Complaint Resolution

When a complaint is received, the Site Manager shall ensure the following steps are undertaken:

1. Inspect the site and surrounding area to identify possible sources of visible fugitive dust;
2. Obtain weather data for the time of the event; and,
3. Note all on-site activities at the time that the complaint was made.
4. If the information indicates that the facility is not the source of the dust complaint, the complainant shall be notified of this finding.
5. If it is determined that the complaint may, in fact, have been related to the facility operations, the following response procedures shall be followed, in the order provided below:
    - Level 1 - Correction of operations as soon as practical. The Site Manager shall ensure that all elements of the BMPP are being followed. Control measures shall be stepped up or operations may be curtailed, as required.
    - Level 2 – Review of Best Management Practice Plan. If the Level 1 response does not adequately resolve the problem, the BMPP shall be reviewed to look for additional control measures to address the source of the dust complaint.
    - Level 3 – Operational modifications. If the Level 2 response does not adequately resolve the problem, the operator shall commit to making physical changes to the facility to address the source of the dust complaint, such as additional enclosures, relocation of equipment, or additional paving.