

FINAL REPORT



LICHTY PIT

TOWNSHIP OF CENTRE WELLINGTON, ONTARIO

BEST MANAGEMENT PRACTICES PLAN FOR DUST
RWDI #2603491

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SUBMITTED TO

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VERSION HISTORY

Index	Date	Pages	Author
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REPORT SIGNATURES

A handwritten signature in black ink, appearing to read 'B. Sulley', written over a horizontal line.

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



1 INTRODUCTION

1.1 Overview

This Best Management Practice Plan (BMPP) for dust was prepared for James Thoume Construction Ltd. (Thoume) for implementation at their Lichty Pit (the “Site”). This plan includes dust control measures that meet or exceed the current industry standards. Implementation of these measures will ensure that dust is effectively controlled, and off-Site impacts 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 Sources¹. 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, typically less than 17%.

1.4 Overview of the Best Management Practices Plan

This document provides a separate section for fugitive dust sources at the Site, 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 Conservation and Parks (MECP)

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"; and,
- 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

3.1 Activities Included

- Topsoil removal using an excavator, scrapers and haul trucks.
- Berm construction using haul trucks, scrapers and bulldozer.
- Rehabilitation using loaders, haul trucks, scrapers and bulldozers.

3.2 Controls

- Avoid topsoil removal and berm construction operations, if possible, during dry months, i.e. 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.
- Topsoil removal and berm construction operations shall be monitored hourly when the following criteria are met:
 - Dry weather is anticipated;
 - Topsoil removal activities are within 150 m of a residence;
 - Winds are anticipated to be blowing towards the residence; and,
 - This does not apply to houses at 5999 8th Line East and 7190 Sideroad 12 as these are understood to be the houses of the landlords / landowners of the pit licence.
- If visible dust is observed under these conditions, these operations shall be reduced, or additional mitigation measures shall be undertaken, such that visible 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 Site to reduce the potential for dust to migrate to nearby residences.
 - This does not apply to houses at 5999 8th Line East and 7190 Sideroad 12 as these are understood to be the houses of the landlords / landowners of the pit licence.



4 AGGREGATE EXTRACTION

4.1 Activities Included

- Excavation and loading of sand and gravel onto off-road haul trucks at working face by excavators and / or front-end loader.

4.2 Controls

- Excavation and loading operations shall be monitored hourly when all of the following criteria are met:
 - Dry weather is anticipated;
 - Excavation and loading activities are within 150 m of a residence;
 - Winds are anticipated to be blowing towards the residence; and,
 - This does not apply to houses at 5999 8th Line East and 7190 Sideroad 12 as these are understood to be the houses of the landlords / landowners of the pit licence.
- If visible dust is observed under these conditions, these operations shall be reduced, or additional mitigation measures shall be undertaken, such that visible dust is prevented from leaving the Site.



5 AGGREGATE PROCESSING

5.1 Activities Included

- Aggregate crushing, screening, washing and stockpiling at the processing plant.

5.2 Controls

- The processing plant, stockpile area and loading of trucks around the stockpiles shall be at least 150 m from the nearest residence.
- This does not apply to houses at 5999 8th Line East and 7190 Sideroad 12 as these are understood to be the houses of the landlords / landowners of the pit licence.
- The portable processing plant shall be equipped with a water spray system.
- Spray bars shall be located at various locations as needed to control visible dust emissions such as at the crusher, screen, and on the conveyor belt system.
- Watering rate will be set as needed to suppress visible dust.
- 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 1 metre or less.
- The processing rate shall not exceed 2,000 tonnes/day.
- When the temperature is below 4°C, the use of water sprays is not feasible. Under these conditions, operations shall be reduced, or other mitigation measures implemented, such as enclosures or wind screens, such that visible dust is prevented from leaving the Site.



6 UNPAVED HAUL ROUTES

6.1 Activities Included

- Movement of trucks or loaders along unpaved haul routes from the working face to processing plant.
- Movement of trucks and loaders in and around the processing plant and stockpile areas.
- Shipping of aggregates from the stockpile area to the site entrance.

6.2 Controls

- Thoume shall have access to a water truck that is capable of delivering water evenly over the active haul route surface at a rate of at least 1.5 L/m²/hour when required.
- The water truck and sufficient water supply shall be available to provide water to all travelled unpaved traffic areas (seldom used routes or service roads do not normally require water).
- The actual watering rate shall vary, depending on surface moisture conditions and traffic conditions, and shall be triggered by the Operational Watering Forecasting guidance provided in **Section 9** of this BMPP.
- At the start of each day, prior to trucks accessing the haul routes, the travel surfaces will be inspected, and water will be applied if dry conditions are found.
- A speed limit of 20 km/h shall be posted near the Site entrance. Haul truck and highway truck operators will be directed to observe the speed limit.
- When the temperature is below 4°C, watering is not recommended for safety reasons. Under these conditions, operations shall be reduced, or other mitigation measures implemented, such that visible dust is prevented from leaving the site.



7 WIND EROSION

7.1 Activities Included

- Wind erosion may occur at disturbed areas, or at stockpiles that have relatively high silt contents, such as screenings or granular aggregate.
- Wind erosion may occur from disturbed areas include the working face during above-water sand and gravel extraction, below-water quarry extraction, areas that have been stripped but not yet extracted (and are not yet below-water), 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 m/s (18-25 km/h).

7.2 Controls

- The amount of disturbed area will be kept to the minimum necessary for extraction to proceed in an efficient manner.
- Stockpiles of finer-grained material will be located on the eastern side of the plant area to be sheltered from prevailing winds by other piles.
- Where possible, trees surrounding the site shall be retained.
- Where berms are constructed for noise control purposes, planting of trees on the side of the berm facing residential receptors is recommended, although not mandatory. Ideally, these trees shall:
 - Consist primarily of coniferous trees, with an initial planted height of at least 1 metre;
 - Be planted to a thickness of at least 10 metres (i.e., a minimum of 2 rows of trees spaced 4.5 metres apart); and,
 - Be planted as soon as the berms have been constructed and seeded, such that the trees will be effective as a supplementary screening measure within the first few years of operation.



8 PROGRESSIVE AND FINAL REHABILITATION

8.1 Activities Included

- Rehabilitation activities include berm removal, establishing appropriate slopes, final grading, etc. This work will be done using excavators, front-end loaders, haul trucks and / or dozers.

8.2 Controls

- Avoid rehabilitation operations, if possible, during dry months, i.e. July, August and September and during peak periods of extraction and processing of aggregates.
- Rehabilitation operations shall be monitored hourly when the following criteria are met:
 - Dry weather is anticipated;
 - Overburden removal activities are within 150 m of a residence;
 - Winds are anticipated to be blowing towards the residence; and,
 - This does not apply to houses at 5999 8th Line East and 7190 Sideroad 12 as these are understood to be the houses of the landlords / landowners of the pit licence.
- If visible dust is observed under these conditions, these operations shall be reduced, or additional mitigation measures shall be undertaken, such that visible dust is prevented from leaving the Site.



9 OPERATIONAL WATERING FORECASTING

9.1 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.

9.2 Conditions Under Which Watering is Required

- The Site operator should monitor local weather conditions using local weather forecasts.
- When the site is operating, the frequency of watering shall be determined approximately using the guidance provided in the table below.
- If no extraction, processing or shipping operations are occurring, watering is not required, unless wind erosion of exposed materials is observed.

Temperature	Relative Humidity	Hours Between Watering @ 1.5 L/m ²
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 the residences adjacent to the Site.
- 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.



10 ADMINISTRATION

10.1 Implementation Schedule

- All control measures shall be in a state of readiness before operations commence.

10.2 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 BMPP is reviewed annually.
- The BMPP shall be kept on file at scale house (or with other health and safety information and procedures on site).

11 INSPECTION & MONITORING

11.1 Inspection and Maintenance

- The water spray system for the processing plants shall be inspected regularly.
- If Thoume owns the water truck, regular inspection and maintenance of the water truck will be performed to ensure the truck are always in good condition.

11.2 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 9**.
- Visual inspection for dusty conditions shall occur at a minimum of twice daily.
- In accordance with **Sections 3, 4, and 8** of this BMPP, visual inspections shall be carried out hourly when overburden removal, berm construction, rehabilitation, excavation and loading operations are near a residence; dry weather is anticipated; and winds are anticipated to be blowing towards a residence.
- This does not apply to houses at 5999 8th Line East and 7190 Sideroad 12 as these are understood to be the houses of the landlords / landowners of the pit licence.
- The Site Manager or their delegate will be responsible for monitoring current conditions and weather forecasts from Environment & Climate Change Canada or suitable alternative, to subsequently help plan for current and next day watering needs and other measures.

11.3 Record Keeping

- Records shall be kept of when and how dust control measures are implemented and when complaints are received, if any. As a minimum, the following activities or events shall be recorded:
 - Water is applied on regularly travelled unpaved roads, including the number of loads applied;
 - Visible dust is observed leaving the property; and,
 - A complaint is received.
- In addition, records shall also be kept of the results of all Inspection, Maintenance and Monitoring activities, including the following:
 - Inspection and maintenance of the water spray system for the processing plant.
 - Inspection and maintenance of the water truck, if applicable.
- Results of visual inspections including the time of the inspection and meteorological conditions at the time of the inspection.



12 COMPLAINT TRACKING AND RESOLUTION

12.1 Complaint Tracking

- A sign posted at the site entrance shall include a phone number for neighbours to call if they have concerns.
- Thome shall request that the local MECP office and Township of Centre Wellington 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.

12.2 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 dust;
2. Obtain weather data for the time of the event;
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:
 - a. 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.
 - b. 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.
 - c. 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 relocation of equipment, greater frequency of water application, or additional paving.