Ministry of Environment and Climate Change Strategy

GUIDANCE and TEMPLATE
REGIONAL OPERATIONS BRANCH | June 2020

How to Develop a Fugitive Dust Management Plan

Purpose of this document

This document is intended to assist applicants in developing a site-specific Fugitive Dust Management Plan (plan). It is not intended for the mining industry, for which specific dust management plan guidance is available.

If you have been asked to provide a plan to the ministry, the sections of this guidance document must be addressed in full. If you believe certain information contained in the template is not required write "not applicable" under the heading and provide an explanatory statement for the omission. Plans that are missing required information without justification will be considered incomplete and may be rejected.

How to use this document

This document provides guidance and is arranged as a template. It has headings and subheadings that provide key aspects and information that a plan should contain. The template is not meant to bind proponents to a particular layout. Different projects will require different levels of detail, such as different levels of monitoring and reporting due to different levels of concern: the site-specific plan should reflect this. Many facilities may already have a dust management plan under Work Safe BC and much of that plan may be applicable for this plan as well.

About Dust

Dust is highly visible and impacts nearby properties by causing nuisance and affecting quality of use and vegetation. If respirable, dust can be a human health concern with both acute and chronic outcomes for local populations. Fugitive dust emissions can also act as a transport mechanism for other contaminants such as metals, establishing a link between contaminant sources and sensitive receptors off site. The nature of the contamination can impact both ecological and human receptors.

Fugitive dust emissions generated by yard dust are one of the main factors contributing to public complaints made to the Ministry of Environment and Climate Change Strategy.

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1.0 Introduction

1.1 Permitting and Company Information

Specify the permit(s), authorizations or approvals for which this document is being developed, the company name and business type at the facility.

1.2 Purpose of the Plan

Describe the purpose of the plan, considering nearby sensitive receptors. For example:

"This plan has been developed to control the offsite transport of dust and to prevent it from becoming a nuisance for local residents by covering buildings and vehicles as well as to prevent dust from interfering with nearby crop field growth."

2.0 Roles and Responsibilities

Describe the roles and responsibilities for the people or positions that are developing, implementing, and ensuring compliance with the plan.

3.0 Facility Description and Setting

3.1 Physical Location

Provide the facility location and its relation to local communities and other sensitive receptors. A sensitive receptor is anything that could be harmed by the dust. Examples include a plant nursery, a fish farm, a sensitive river, livestock, a viewpoint of interest etc. An overview of surrounding land use should also be provided.

3.2 Descriptive Overview of the Facility

Provide a brief overview of the site and the activities that could result in fugitive dust. This could be presented as a bulleted list.

3.3 Facility Site Map

Provide a site map that shows the locations or areas where all fugitive dust emission sources are located and shows the site features discussed in the facility description (a google map image can be used and is often the easiest method). Please include a legend listing the fugitive dust sources on-site and include GPS locations for all identified fugitive dust emission sources on the site map.

4.0 Identification of Potential Sources of Fugitive Dust

4.1 Fugitive Dust Source List

The fugitive dust source list must include the following:

- identification number for sources or designation for each source type
- location of the source within the facility (or reference ID on an attached site map)
- potential source of fugitive dust
- list of possible contaminants in the fugitive dust
- factors influencing generation of dust (e.g. wind, operational activities, dry conditions etc.)
- identification of the dust-generating material (e.g. aggregate, sawdust, clean coal, road dust)

Potential sources of fugitive dust vary from site to site based on site-specific conditions but may include:

- parking lots
- high traffic areas
- conveyors and crushing facilities
- storage areas (including tailings storage facilities and stockpiles)
- transfer or handling operations
- transfer points such as drops, hoppers or bins
- exposed areas with sandy or loamy textured soils/surficial materials

EXAMPLE Source List

Unique identifier	Location	Potential Source	Dust-generating material	Generation conditions	Description	Level of dust generation risk	Possible contaminants
S-01	South West corner of the property	Stock piles	Fine aggregate 0.5mm - 1mm, 1mm - 2mm	Wind conditions, operations	2 piles, approx. 10 m wide 4 m high	medium	None, water cleaned aggregate
Mill yard area	Paved wood storage area and roads	Vehicle traffic	Saw dust, dust on vehicles	Wind conditions, operations	Approx. 1200 m^2	low	Cedar sawdust, particulates from vehicles
Unpaved access roads	Entrance to site, roads around storage tanks	Vehicle/heavy equipment traffic	Road dust	Operations	300 m long, 5 m wide Approx. 600 m of secondary roads	high	Road dust, particulates from vehicles

4.2 Source List Review

Describe your procedure to ensure the source list is reviewed and updated on a regular schedule to reflect changes in the processes that create dust onsite as well as changes in the dust management practices used onsite. This procedure should identify the person(s) or position (name and/or title) who is (are) responsible for these reviews and how frequently these reviews will be undertaken.

5.0 Fugitive Dust Management

5.1 Site Specific Mitigation Measures

This section of the plan must describe the following for each fugitive dust mitigation measure (it is important to identify and describe what measures will actually be completed onsite, not what may or could be completed. Please be as specific as possible):

- the specific fugitive dust mitigation actions being taken
- the location where the action will be conducted
- the title of the individual(s) performing the actions
- what conditions will cause the mitigation measures to be applied
- the estimated frequency of application/mitigation at each location
- how the mitigation measure will address the cause of dust generation for each source

Where applicable, the following must be addressed:

- best management practices used on site
- what equipment/systems will be used
- what is the estimated effectiveness application/mitigation at each location
- what chemicals will be used and their potential effect to the receiving environment
- contingency measures if mitigation measures are insufficient/no longer efficient

Please consider the following example when preparing your plans.

EXAMPLE

"5.1.1. Wood Pile Spraying

The <Individual performing the action's title> will spray all of the wood chip piles located in the <specific location> using a water truck and hose in order to reduce wind blown dust from the piles leaving the site.

Piles will be sprayed <frequency, for example "once per week"> when precipitation has not occurred for seven or more days and piles are not covered by snow, or when fugitive dust can be observed visually being blown from the piles.

During a spray event, spraying will continue until the <Individual performing the action's title> observes that the surface of the pile(s) is sufficiently wet so as to control fugitive dust emissions from the piles to his or her satisfaction and to the results required by the operation's best management practices. Spraying should control fugitive dust for approximately <approximate duration>.

If wind blown fugitive dust from the piles is observed after spraying, the <Individual performing the action's title> will <describe the contingency actions to be taken> in order to control <estimated percentage of dust controlled> of wind-blown dust from the chip piles."

6.0 Plan Implementation

6.1 Training

For the site personnel identified in the 'Roles and Responsibilities' section, identify their training needs and the frequency of training to ensure that they are aware of and capable of performing their responsibilities under the plan.

Note: While not all site personnel may be directly involved in implementing the plan, all site personnel should be aware of the plan and know the appropriate person to contact in the event that they observe fugitive dust during the course of their regular activities.

6.2 Monitoring and Maintenance

Monitoring activities should be tailored to the needs of the site and could include: recording public complaints, visual inspection and monitoring of facilities by site personnel, and/or quantitative monitoring of the environment, such as passive particulate deposition or active suspended particulate (TPM, PM_{10} or $PM_{2.5}$) sampling on or off site to evaluate the effectiveness of dust control practices and to quantify levels of fugitive dust and its composition leaving the site. Whichever methods are chosen to monitor the magnitude and extent of dust generated from the site or to characterize the quality of the dust to help understand potential effects, they need to be selected based on clearly defined monitoring objectives.

Consideration should also be given to what metrics will be used to judge the effectiveness of the mitigation program. These may include comparison of monitoring data to baseline or background data, predicted values from environmental impact assessment studies, thresholds in established air quality objectives or site-specific criteria agreed on by regulators and stakeholders. Qualitative measures of effectiveness may also be considered, such as number of complaints or visual observations and may be most appropriate for many projects.

Regular maintenance of potential sources of fugitive dust as well as both source control equipment and monitoring equipment are essential to ensure the plan is adequately addressing concerns. A schedule for monitoring and maintenance should be included and may include procedures for inspecting fugitive dust sources to ensure that control methods (source control and/or best management practices) are being implemented as described in the plan and/or functioning according to manufacturer's specifications. The procedure must include the following:

- the role of the person(s) who is/are responsible for the inspections;
- any training the person(s) responsible for the inspections will receive;
- the frequency of inspection of the identified sources;
- what, if any, equipment is needed for the inspection (e.g. soil humidity sensor, calibration kit) and
- what records must be maintained to document the inspections (see section 7).

Note: Different projects will have different fugitive dust management needs which will be reflected in the information needed for this section. Less intensive plans may be best in a paragraph format while more intensive plans with more sources and monitoring may find using tables to be the most effective.

Additional notes to consider:

The establishment of soil, water and vegetation monitoring programs should be considered if transportation of contaminants (e.g. metals) offsite and their accumulation in the environment is a concern. The use of camera or video recording (webcam) systems could also be considered to monitor dust events and initiate mitigative actions.

If an in-depth quantitative sampling plan is to be developed for the project the use of a Qualified Professional[1] is recommended along with consultation with ministry staff before commencing a monitoring program and may be required.

A note of caution regarding dustfall sampling (passive open canister exposure): while it has been common practice to use this sampling methodology in many industrial situations, it has its limitations and is no longer recommended by the ministry, except in specific limited circumstances (i.e. for management of aesthetic or dust nuisance concerns. It should also be noted that the former B.C. Pollution Control Objectives (PCO's) for Dustfall were rescinded in 2006; they were not developed with the intention of being protective of human or environmental health. A more detailed discussion of dustfall sampling and PCO's, as well as suggested alternative monitoring approaches, can be found in the Ministry of Environment and Climate Change Strategy document titled "Dustfall Monitoring and Pollution Control Objectives" available online.

If real-time management of dust episodes is a plan objective, then continuous, real-time monitoring of TSP or PM_{10} should be considered to enable timely trigger information and mitigation response. The use of video cameras could also assist in this approach.

Monitoring of particulate matter ($PM_{2.5}$ and PM_{10}) is recommended if human health is a concern (e.g. nearby residents or communities) as exposure to $PM_{2.5}$ and PM_{10} is linked to a range of health impacts. This monitoring should be continuous and real-time if immediate response is the objective; otherwise non-continuous, filter-based sampling could be implemented as a surveillance and assessment tool.

When dust is analyzed for metals (or other contaminants), it is recommended that the test results be evaluated for potential health or environmental impacts. In order to assess health impacts, appropriate health-based thresholds should be identified, and rationales provided for the air quality criteria used. A suggestion would be to identify and compare appropriate thresholds from appropriate agencies (e.g. Health Canada, US Environmental Protection Agency, etc.) and expanding out to further jurisdictions as needed. Please note that ingestion guidelines (e.g. CSR soil guidelines) should not be used to screen for health effects associated with the inhalation pathway (e.g. air quality exposures). If accumulation of metals or other contaminants in the off-site environment is a concern, it may be more appropriate to develop monitoring plans that address the environmental media (soil, water, vegetation) directly.

[1] Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and b) through suitable education, experience, accreditation and knowledge, may reasonably by relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.

7.0 Reporting and Record Keeping

7.1 Record Keeping

Describe record keeping procedures for the plan. Records are a tool for proving compliance with the plan and should be tailored to provide evidence that the mitigations and best practices described in the above sections are being completed. For example:

- If a twice daily visual inspection of piles is listed as a mitigation tool, records should show when the check was conducted, visual inspection results, whether corrective actions were taken and if actions were sufficient to reduce fugitive dust.
- If a plan for mitigation of haul road dust is to water the road as requested by staff in the area, records should show all request times, responses, corrective actions taken and if actions were sufficient to reduce fugitive dust.
- If a management practice requires weekly testing of in-place water sprayers for surface dust then records should show when this has occurred, the weekly testing results, whether corrective actions were taken and if actions were enough to reduce fugitive dust.

Note: Record-keeping documents must be made for each mitigation action. Records that do not address the details listed in this section may be considered out of compliance during an inspection by the ministry.

A complaint tracking tool and a record of dust events and responses to those events should also be kept. Recording requirements should be discussed with ministry staff as expectations and requirements can vary between projects. However, records should be kept for a minimum of five years and should be able to show evidence of compliance with the stated management and/or abatement methods.

Please consider the following record report example when preparing your plan:

EXAMPLE

Chip pile spraying log

Weather Conditions	Date and time (yyyy/mm/dd)	Area sprayed	Water truck #	Visible dust controlled? (y/n)	Further actions required? Describe	Name
30˚, dry and cloudless, mid strength winds	2019/10/27	North West hog fuel piles	2	no	Yes, Covered piles with tarps	Jane Doe

7.2 Reporting and Communicating

Many permits contain annual reporting requirements which can include reporting out on activities from the plan. In this section, describe what information will be included in the annual report. Annual reports must include, but are not limited to, the following information:

- monitoring results,
- effectiveness of mitigation measures,
- number of dusting events that occurred,
- complaints received, and the actions taken to address complaints, and
- deficiencies identified in the plan and corrective actions taken.

It is best to discuss what information would be required in the annual report with a ministry staff person to ensure compliance with your authorization document/permit.

In addition, it can be advantageous to actively engage local communities and Indigenous communities in areas which have air quality concerns. For some authorizations, reporting to Indigenous communities or the public can be a requirement and can vary from significant to zero depending on the project. The plan should contain the frequency and format of communication to keep local and Indigenous communities informed in a timely manner on facility activities and plans to manage fugitive dust if required by the permit or plan.

If needed, consider different communication options with local communities, Indigenous communities, and regulatory agencies in situations when dust is expected to be an issue (i.e. communicate potential dusting events or while an event is in progress). This should be identified within the plan and, as with reporting to interest groups, can range from significant to zero depending on the project. Information should be made available during/in the-short-term aftermath of a dust event. Some examples that have been used include:

- providing public notice via social media and to key contacts during an event
- providing access for the public or groups to real time monitor information or webcams via a company website.

REVISION HISTORY			
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