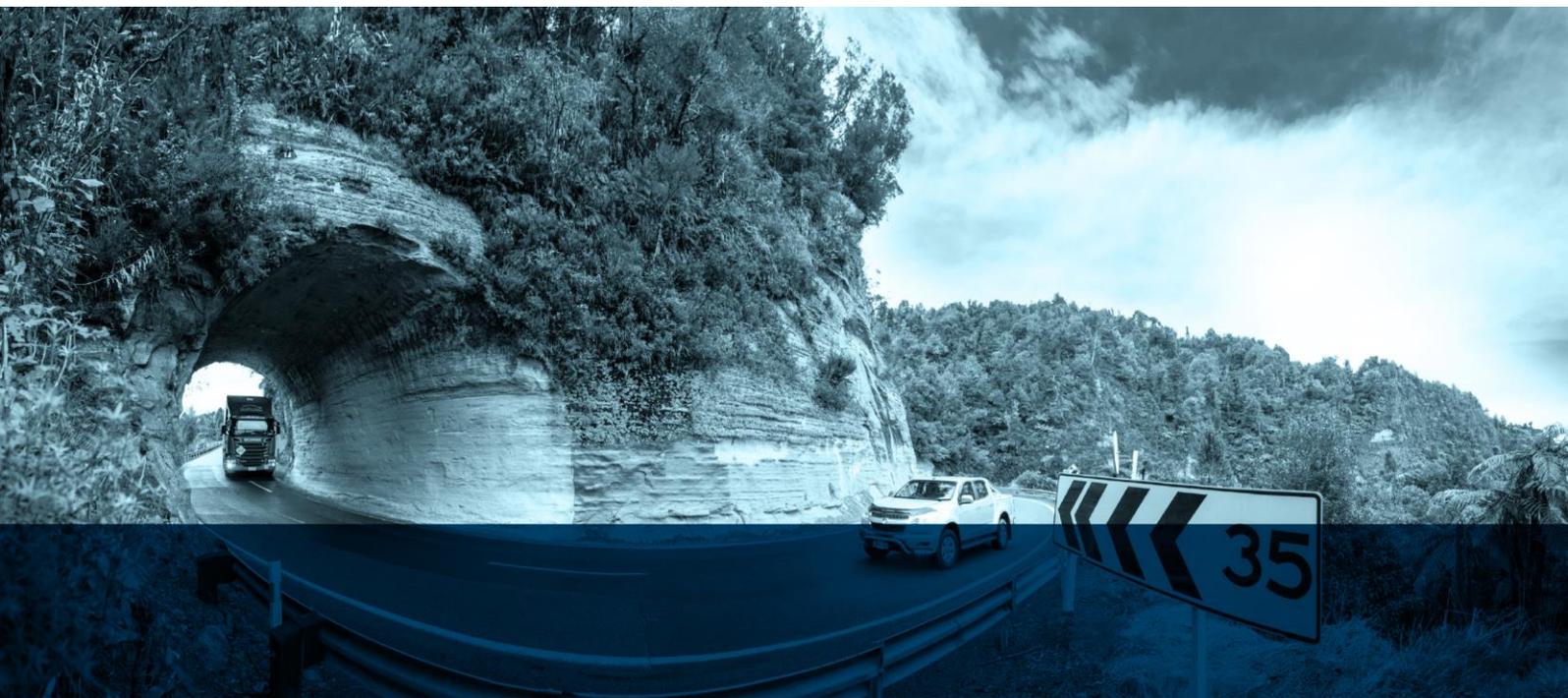


Construction Dust Management Plan

October 2018

Mt Messenger Alliance

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Quality Assurance Statement			
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Glossary of Terms and Abbreviations

Acronym /Term	Definition
CEMP	Construction Environmental Management Plan
CDMP	Construction Dust Management Plan
MFE	Ministry for Environment
NPDC	New Plymouth District Council
SH3	State Highway 3
TRC	Taranaki Regional Council

1 Introduction

This Construction Dust Management Plan (CDMP) has been prepared for the NZ Transport Agency's Mt Messenger Bypass project (the Project).

1.1 Purpose and objectives of the CDMP

The CDMP has been prepared to manage, mitigate, and monitor dust emissions during construction of the Project. The objective of the CDMP is to detail the best practicable option to avoid dust nuisance being caused by construction works and to mitigate any such effects should they occur.

The CDMP identifies the following:

- Potential sources of dust that may be created during the construction project;
- Sensitive receptors in the vicinity of identified potential sources of dust for targeted dust management;
- Dust management and mitigation methods;
- Monitoring methods;
- Training of staff in relation to dust management; and
- Methods for managing complaints regarding discharges into air and keeping compliance records.

In preparing this CDMP, information has been drawn from practical experience with the management of dust emissions from large construction projects as well as the following documents:

- *The Good Practice Guide for Assessing and Managing Dust*, prepared by the Ministry for the Environment, November 2016;
- *Guide for Assessing Air Quality Impacts from State Highway Projects*, prepared by the NZ Transport Agency, Version 2.0, December 2014, DRAFT; and
- *Erosion and Sediment Control Guidelines for State Highway Infrastructure*, NZ Transport Agency, September 2014.

This CDMP is an Appendix to the Construction Environmental Management Plan (CEMP) for the Project. The construction methodology for the Project is set out in the CEMP; as well as in the Assessment of Environmental Effects for the Project.

The CDMP shall remain in place until the completion of construction.

1.2 Review and updates to the CDMP

This CDMP is a live document that will be reviewed and updated during the course of the Project to reflect significant changes associated with construction techniques, mitigation, monitoring results or the natural environment.

A review and amendment process is described in Section 8 of the CEMP. The review process for this CDMP shall include reviewing any comments or recommendations from Taranaki

Regional Council (TRC) and / or New Plymouth District Council (NPDC). The outcomes of any review shall be provided to TRC.

1.3 Relevant conditions

Table 1-1 identifies the resource consent conditions relevant to this CDMP and where they are addressed in the plan.

Table 1-1: Resource Consent Conditions relevant to this CDMP

Condition No.	Condition	Relevant CDMP section
AIR.1	The Construction Dust Management Plan (CDMP) identifies and details methods to be used to manage, mitigate and monitor dust emissions during the Works. The CDMP shall remain in place until the Completion of Construction Works/	This plan
AIR.2	<p>The CDMP includes, but need not be limited to:</p> <ul style="list-style-type: none"> (a) identification of potential sources of dust taking into account construction activities and the construction programme; (b) identification of sensitive receptors likely to be adversely affected by emissions of dust; (c) methods for managing and mitigating adverse dust effects that may arise from construction activities, particularly in proximity to sensitive receptors. Where appropriate, these methods may include: <ul style="list-style-type: none"> (i) the use of water carts or sprinklers to apply water to areas generating dust; (ii) reducing vehicle speeds on unsealed surfaces; and (iii) the use of commercial dust suppressants; (d) an outline of the methods for managing the effects of dust on the dwelling at 2397 Mokau Road; and (e) the methods of monitoring for potential dust generation, including assessment of weather conditions, soil conditions and visual dust assessments. 	<p>Section 2</p> <p>Section 3</p> <p>Sections 4.1 and 4.2</p> <p>Section 4.4</p> <p>Section 5</p>

2 Construction activities that may generate dust emissions

The main construction activities that may generate dust are as follows:

- Construction yard, site and haul road establishment;
- Topsoil removal and distribution;
- Excavations;
- Cut and fill operations;
- Soil stabilisation and base course construction;
- Loading and unloading of bulk materials;
- Stockpiling of materials, including unloading and placement;
- Establishment and operation of spoil disposal sites;
- Vehicle movements on unsealed roads; and
- Wind erosion from exposed areas and stockpiles.

The most significant sources of dust generation during the Project construction works will be:

- Stockpiles;
- Exposed areas during earthworks; and
- Vehicle movements on unsealed haul roads.

Management of these activities is discussed in Section 4 of this CDMP.

3 Sensitive receptors

Sensitive receptors to dust emissions during construction will include residential houses and sensitive ecosystems.

3.1 Human receptors

The risk of exposure of sensitive receptors to dust emissions depends on the following factors:

- Proximity of sensitive receptors to construction activities that could give rise to dust emissions; and
- Frequency and duration of meteorological conditions that are likely to transport dust towards the sensitive receptors (e.g. dry conditions and winds greater than 5m/s in the direction of receptors).

Dust discharges from earthworks and construction activities typically deposit onto the ground within approximately 100m of the activity. In open conditions, there is unlikely to be any appreciable effect of dust from construction activities at distances over 200m. Dense vegetation acts as a filter to dust emissions, with dust being captured on the leaves. Consequently, where earthworks are carried out in areas of bush, dust is unlikely to penetrate more than a distance of the order of 10 to 20m.

For the reasons sets out above, there are only three sensitive residential receptors in the vicinity of the Project. These are the three houses located within 200m of the Project:

- 2397 Mokau Road at the southern end of the alignment, approximately 45m from the southern stockpile area;
- 2528 Mokau Road at the southern end of the alignment, approximately 120m from the nearest point of earthworks; and
- 3072 Mokau Road at the northern end of the alignment, approximately 90m from the main construction yard, 97m from the nearest point of earthworks.

The closest receptor to works, 2397 Mokau Road (approximately 45m from proposed stockpile activity), has a high risk of dust effects in dry conditions and winds blowing from the stockpile towards this receptor. Targeted dust controls will be required in relation to the southern stockpile area (as discussed in Section 4.3 of this plan).

3.2 Ecological receptors

Construction works will occur within areas of native forest and grassland. Native vegetation in the Project area should be treated as sensitive to dust. Accumulation of dust on this vegetation should be avoided as far as practicable.

4 Management procedures and mitigation measures

4.1 Overview

The overall approach to dust management for the construction works is primarily based on visual monitoring, combined with good management of the construction areas and a rapid response to any of the triggers outlined in Table 4.2 (refer to Section 4.3) or complaints received. Taking a proactive approach to dust management will help avoid significant dust emissions or, if dust emissions occur, help mitigate any adverse effects.

4.2 General dust management measures

The dust management measures outlined in Table 4.1 will be used as applicable across the Project, depending on the construction activities undertaken, weather conditions, and proximity to sensitive receptors. The list is not necessarily exhaustive, and additional methods may be found to be effective and implemented during construction.

Table 4.1: Dust management measures

Source of Dust	Control
General mitigation measures	<ul style="list-style-type: none"> • Planning of site layout so that dust causing activities are located away from sensitive boundaries where practicable. • Site personnel trained in dust management controls. • Monitoring of site conditions (weather/soil conditions) to anticipate and prevent dust effects. • Limiting operations which have the potential to cause high dust during high wind events. • Use of water cart and sprays to keep surfaces damp as required near sensitive receptors. A critical part of this control measure is identification of a sufficient water supply at the site for this purpose with adequate volume and where relevant compliance with resource consent conditions 45 to 48. • Use of wind break fences. • Cleaning paved surfaces if affected by tracking of transported dust.
Stockpiles (including material placement and removal)	<ul style="list-style-type: none"> • Making sure stockpiles exist for the shortest possible time. • Stockpiles oriented to maximise wind sheltering where possible. • Stockpiles positioned as far as practical away from sensitive receptors. • Limiting the height and slope of stockpiles to reduce wind entrainment near sensitive receptors. • Take into account the predominant wind direction when siting stockpiles to reduce the likelihood of affecting sensitive receptors.

Source of Dust	Control
	<ul style="list-style-type: none"> Surfaces of stockpiles to be kept damp to reduce dust emissions (e.g. through wet suppression systems) or covered or stabilised to reduce dust generation in areas adjacent sensitive receptors.
Unpaved surfaces, such as haul roads and construction yards	<ul style="list-style-type: none"> Unsealed surfaces kept damp to reduce dust emissions in areas near sensitive receptors (e.g. by use of water carts). Where practical, compact unconsolidated surfaces to minimise dust. Stabilisation of surfaces when works are completed by grassing, metalling or sealing surfaces to reduce dust emissions. Consideration to use of polymers for surface stabilisation where there is a high risk of effects, such as where haul routes are in proximity to sensitive receivers.
Sealed surfaces	<ul style="list-style-type: none"> Clean excess dirt from vehicle tyres prior to leaving the site and driving onto sealed roads to reduce tracking of soils and re-entrainment of dust.
Vehicle movements	<ul style="list-style-type: none"> Setting lower vehicle speed limits on unsealed surfaces in areas near sensitive receptors. Reducing transportation of dust through regular cleaning of vehicles including wheels. Covering truck loads if the materials carried are fine, dry or otherwise likely to generate dust when travelling near sensitive receptors and/ or off-site.
Earthworks and Construction Activities	<ul style="list-style-type: none"> Drop heights of materials to be minimised to reduce dust generation. Monitoring and managing of earthworks activities to limit dust generation during dry or windy weather conditions.

4.3 Specific dust management – southern spoil disposal site

The closest receptor to works, being the residential dwelling at 2397 Mokau Road (located approximately 45m from the proposed southern spoil disposal site), has a high risk of dust effects in dry conditions and winds blowing from the direction of the disposal area towards this receptor. The volume of the spoil disposal site will be approximately 35,565m³ and it will operate as a permanent disposal site during the bulk earthworks phase of the Project. Targeted dust controls will be required to mitigate effects on this dwelling associated with the operation of the spoil disposal site.

Material likely to be disposed of in the southern disposal site will include topsoil, subsoil, unsuitable material gained from the bulk earthworks operations, and imported hardfill material, such as crushed rock and/or road aggregate.

Site specific dust controls for this area will include:

- Site layout design to maximise separation distance of activities associated with the disposal site from the property at 2397 Mokau Road and orientation of disposal area / stockpiles to maximise wind sheltering;

- The disposal area has been designed with an approximate design height of 3.5m above the existing surface level. The disposed material will generally fill the existing valley with a low grade of approximately –1.5% to –3% from east to west with a grade of –25% at the batter at the western end of the disposal site;
- The disposal site will be managed in accordance with the Construction Water Management Plan (CWMP) and final Specific Construction Water Management Plan for the area;
- The roadways at the entry and exit points of the spoil disposal site will be stabilised to minimise the transfer of sediment onto the external road network;
- Managing vehicle speeds on the access track at the spoil disposal site to minimise visible dust emissions;
- Daily visual monitoring of the spoil disposal area should be undertaken to anticipate and mitigate any adverse dust effects;
- If visual monitoring indicates significant dust is being transported off-site, wet suppression using watercarts will be implemented to keep surfaces damp; and
- Other contingency measures outlined in Section 4.4 will be implemented in the event of visible dust emissions and/or complaints.

Additional erosion and sediment control measures to reduce the generation of sediment from the stockpile are discussed in the CWMP.

4.4 Contingency measures

As discussed in Section 4.2, a range of standard dust controls will be used to manage and mitigate the effects of discharges of dust during construction of the Project. Additional mitigation may also be required in the event that:

- Monitoring indicates that significant dust emissions are occurring;
- Weather conditions are changing such that dust emissions are more likely; and / or
- Complaints are received regarding dust.

If the available mitigation methods are unsuccessful in controlling dust emissions and dust emissions may cause significant adverse effects on receptors beyond the Project boundary, the activities causing the discharge shall be suspended until adequate mitigation can be put in place.

Proposed contingency measures are outlined in Table 4.2.

Table 4.2: Contingency measures

Source of Dust	Control
Dust generating activities undertaken near highly sensitive receptors	<ul style="list-style-type: none"> • Install windbreak fences around dust generating activities where practicable. • Additional visual inspections of dust generating activities for visible dust emissions beyond the site boundary.

Source of Dust	Control
	<ul style="list-style-type: none"> • Ensure availability of water as dust suppressant should visible emissions arise.
Dust discharges cause excessive deposition / soiling at sensitive receptors	<ul style="list-style-type: none"> • Stop activities that are generating dust until mitigation is reviewed and additional mitigation is in place. • Report to Environmental Manager to initiate an investigation and any remedial action as necessary.
Equipment Malfunction i.e. breakdown of water cart / sprays	<ul style="list-style-type: none"> • Assess rainfall and wind forecasts, stop work if forecast conditions are particularly dry or windy. • Repair water cart/sprays as soon as practicable.
Forecast winds greater than 5 m/s and dry conditions*	<ul style="list-style-type: none"> • Limit the activities that generate dust within 200 m of downwind sensitive activities. • Additional visual inspection of exposed areas and activities. • Assess the need for additional controls such as increased water application rates.
Forecast winds greater than 10 m/s and dry conditions*	<ul style="list-style-type: none"> • Stop activities that generate dust within 200 m of downwind sensitive activities until wind eases.
Visible dust discharges from stockpiles / areas of uncovered soil near sensitive receptors	<ul style="list-style-type: none"> • Dampen stockpile or exposed area of soil. • Cover or stabilise area to reduce dust generation.

* Dry conditions are defined as no rain in previous 12 hours.

5 Dust inspections and meteorological monitoring

Visual monitoring of dust across all construction areas will be undertaken on a daily basis, or more frequently if conditions change.

Weather forecasts should also be checked daily (wind speed, wind direction and rainfall) to assist in managing site activities and implementing the appropriate dust controls.

Table 5.1 below outlines the visual dust monitoring programme to be implemented during construction. A daily log shall be kept of dust inspections and weather observations as set out in Appendix A.

Table 5.1: Dust inspection programme

Monitoring Activities	Frequency
Check weather forecasts for strong winds and rainfall to plan appropriate dust management response (7 day forecasts available on www.metservice.co.nz).	Daily
Inspect land adjacent to the site, construction exits and adjoining roads for the presence of dust deposits.	Daily
Observe weather conditions, wind via observations and data outputs from weather stations and presence of rain.	Daily and as conditions change
Inspect all unsealed surfaces for dampness and to ensure that surface exposure is minimised, check for visible clouds being generated on site or carried off site.	Daily and as conditions change
Inspect stockpiles to ensure enclosure, covering, stabilisation or dampness. Ensure stockpile height is less than 3m or appropriately stabilised.	Daily and as conditions change
Inspect dust generating activities (as listed in section 2) to ensure dust emissions are effectively controlled.	Daily and as new activities commence
Inspect watering systems (sprays and water carts) to ensure equipment is maintained and functioning to effectively dampen exposed areas.	Weekly
Additional visual monitoring of dust generating activities and water application rate.	In winds over 5 m/s
Inspect site access and egress points to ensure effective operation of wheelwash/truckwash systems and/or judder bars (if installed).	Daily and as conditions change
Ensure site windbreak fences, if used, are intact.	Weekly

6 Complaints

Complaints response procedures are detailed in the CEMP. The procedure for managing complaints specifically associated with dust is detailed further below.

The Environmental Manager has the responsibility to respond to and follow up all complaints regarding dust, and furthermore to ensure that suitably trained personnel are available to respond to complaints at all times. When a complaint is received, the following actions are to be taken:

- In accordance with the CEMP (Section 6.5) when a complaint is received, acknowledgment of the complaint shall be provided within 2 working days.
- Fill out the Project complaint form (refer to Section 6.5 of the CEMP).
- Note the time and date of the complaint/s and (unless the complainant refuses to provide them) the identity and contact details of the complainant. Ask the complainant to describe the discharge: is it constant or intermittent, how long has it been going on for, is it worse at any time of day, does it come from an identifiable source. Wind direction and strength and weather conditions are to be recorded. Note if the complaint has been referred to Taranaki Regional Council (TRC) / New Plymouth District Council (NPDC).
- As soon as possible after receipt of a complaint, undertake a site inspection. Note all dust generating activities taking place and the mitigation methods being used. If the complaint was related to an event in the recent past, if possible note any dust generating activities that were underway at that time. Initiate any remedial action necessary.
- If it becomes apparent that there may be a source of dust other than the construction project causing the complaint, it is important to verify this. Photograph the source and emissions.
- As soon as possible after initial investigations have been completed, contact the complainant to explain any problems found and remedial actions taken. Initiate a damage assessment if required.
- If necessary update any relevant procedures to prevent any recurrence of problems and record any remedial action taken.

7 Roles and responsibilities

The key management roles in relation to environmental management during construction are outlined in Section 4 of the CEMP. Specific roles relating to this CDMP are detailed in Table 7.1.

Table 7.1: Roles and responsibilities

Role	Responsibility
Transport Agency – Requiring Authority and Consent Holder	<ul style="list-style-type: none"> • Overall responsibility for project compliance and performance in relation to environment, quality assurance and incident management. • Obtaining any additional resource consents required during construction. • Review of the CEMP and management plans, including this CDMP.
Alliance Manager Construction Manager Environmental Manager	<ul style="list-style-type: none"> • Overall responsibility for site environmental management. • Reviewing (and updating, if required) CEMP and management plans, including the CDMP. • Reporting on environmental performance. • Inspection of works to assess compliance with the CDMP. • Report to the Transport Agency any changes to construction techniques or natural environmental changes which require alterations to existing consents or new resource consents. • Maintain daily logs and complaint records. • Training of all relevant staff including subcontractors.

8 Training

This section provides an overview of training requirements in relation to environmental management on this Project. Detail on other Project training requirements is outlined in the CEMP.

8.1.1 Inductions

All people working on-site, or with site responsibilities shall undertake a formal site induction as outlined in the CEMP. No person will be permitted to work on the site until they have completed the induction process.

Part of this induction process will be based on environmental management.

8.1.2 Training

The Alliance Management Team, Construction Manager, Site Managers and superintendents will undergo dust awareness training to make all aware of their responsibilities relating to this CDMP.

The environmental induction and training will include the following information specific to the CDMP:

- Information about the activities and stages of construction that may cause dust impacts within the construction area;
- Consent requirements;
- Complaints management procedures;
- Dust management procedures; and
- Dust monitoring for the Project.

Additional training will be provided to water cart drivers and site supervisors, in assessing whether sufficient water has been applied for effective dust suppression.

9 Reporting

The procedures for recording daily dust inspections are as follows:

- The site manager (or delegate) will fill out a daily dust inspection log form (Appendix A) each day and maintain the record on site.
- The following information will be recorded:
 - Any dust control equipment malfunctions and any remedial action(s) taken;
 - Results of the visual inspections of dust emissions;
 - General weather conditions during the day (i.e. windy, calm, warm, rain, etc.);
 - The frequency of watercart and/or water sprinkling system use; and
 - The date and signature of the person entering the information.

Appendices

Appendix A: Daily dust inspection log

Appendix A: Daily dust inspection log

Daily Dust Inspection Log

Date: Time:

Inspection by:.....

Current Weather Condition (e.g. sunny, cloudy, rain):

Wind Direction / Strength (e.g. strong, moderate, light, still)

Area(s) Inspected:

SCOPE OF INSPECTION	Circle the relevant item	COMMENTS		
- Is there visible dust from site work activities, stockpiles, earthworks areas or haul roads?	Y N N/A			
- Are haul roads visibly dry and need spraying with water truck?	Y N N/A			
- Are any exposed earthworks or stockpile areas visibly dry and need water spray?	Y N N/A			
- Stockpile heights less than 3m?	Y N N/A			
- Stockpiles covered/stabilised where needed?	Y N N/A			
- Are there any signs of dust going off site as a result of site activities? [Inspect land adjacent to the site (including vegetation, residential properties and cars), construction exits and adjoining roads for the presence of dust deposits.]	Y N N/A			
- Are site windbreak fences intact?	Y N N/A			
- If wind speeds are over 5 m/s are additional inspection and mitigation measures being put in place? (e.g. increase water application, restrictions on dusty activities)	Y N N/A			
- Are watering systems (e.g. water carts, wheel wash) operating effectively to minimise dust?	Y N N/A			
- Are trucks carrying loose (uncovered) material entering or leaving the site?	Y N N/A			
RECOMMENDATIONS				
Priority (H/M/L)	Actions	By whom	By when	Completed Y/N