Construction Air Quality Management Plan (CAQMP)

NZ TRANSPORT AGENCY
WAKA KOTAHI

1 MacKays to Peka Peka Expressway

Construction Air Quality Management Plan (CAQMP) Revision History

Revision N°	Prepared By	Description	Date
1.0	Camilla Needham	Draft for internal review	25 March 2013
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2.1	Charles Kirkby	Final for certification	20 June 2013

Independent Review

Action	Name	Signed	Date
Reviewed by	Bruce Graham		2 May 2013

Document Acceptance

Action		Signed	Date
Prepared by	Camilla Needham		20 June 2013
Reviewed by	Charles Kirkby/ Anna Lewis		20 June 2013
Approved by	Alan Orange Alliance Project Manager		20 June 2013
on behalf of	M2PP Alliance		

Certification

Action	Name	Signed	Date
Regulatory Manager Approval	Andrew Guerin		26 August 2013
on behalf of	Kāpiti Coast District Council		

Table of Contents

Appendices

Quick Reference Guide to Conditions

Condition Number	Condition Requirement	Comments	Key Final CAQMP Reference
DC.9	Requests for amendments to Management Plans		7.2
DC.25	Dust management outcomes		3.1, 3.4, 4.1 & 4.3
DC.25A	Monitoring of Total Suspended Particulate		4.3
DC.25B	Monitoring of wind speed, wind direction, air temperature and rainfall	On site weather station	4.3
DC.26	Requirement of the CAQMP		1.2
DC.26A	Independent review of CAQMP		1.2
DC.27	Requiring Authority annual review of CAQMP		6, 7.2
DC.28	Odour, dust or fumes beyond the designation boundary		3.1 & 3.4
DC.29	Hazardous air pollutant beyond the designation boundary		3.2, 3.3 & 3.4

Glossary of Abbreviations

Acronym	Definition
CAQMP	Construction Air Quality Management Plan
CEMP	Construction Environmental Management Plan
MfE	Ministry of the Environment
HAPs	Hazardous Air Pollutants
TSP	Total Suspended Particulates
$\mu g/m^3$	Micrograms per cubic metre
KCDC	Kāpiti Coast District Council
SOP	Standard Operating Procedure

1 Introduction

This Construction Air Quality Management Plan (CAQMP) forms part of the suite of Environmental Management Plans within the Construction Environmental Management Plan (CEMP).

This CAQMP addresses the potential construction air quality impacts associated with earthworks and construction activities of the MacKays to Peka Peka Expressway Alliance.

1.1 Purpose and scope

The purpose of this CAQMP is to establish procedures for monitoring the discharge of particulates into the air during construction of the Project, methods to be used to limit dust nuisance, and procedures for responding to any complaints and events (Condition DC.26(a)).

In accordance with condition DC.26(b), the CAQMP details the following:

- Sensitive locations where dust monitoring is proposed, and the specific methods for that monitoring, including trigger limits to determine when further action is required
- Contingency measures to address identified and verified adverse effects on sensitive receptors.
- Visual monitoring of dust emissions;
- Methods to be used to limit dust and odour nuisance;
- Procedures for responding to process malfunctions and accidental dust discharges;
- Criteria, including consideration of weather conditions and procedures for use of water sprays on stockpiles and operational areas of the site;
- Continuous Monitoring of Total Suspended Particulate (TSP) concentrations and meteorology;
- Monitoring of the times of offensive odour emissions from the ground;
- Procedures for responding to discharges of odour (i.e. in the event of excavation of contaminated sites);
- Monitoring of construction vehicle maintenance;
- Process equipment inspection, maintenance, monitoring and recording;
- Complaints investigation, monitoring and reporting; and
- The identification of staff and contractors' responsibilities.

1.2 Certification

This CAQMP is submitted for certification by KCDC prior to construction works commencing and has been reviewed by a suitably qualified independent person prior to submission to the KCDC (in accordance with Conditions DC.26 and DC.26A, refer Appendix B for comments).

1.3 Project description

The Project will provide for two lanes of traffic in each direction, connections with local roads at four interchanges, construction of new local roads and access roads to maintain local connectivity and an additional crossing of the Waikanae River.

The Project includes the following principal design features:

- A four lane median divided Expressway (two traffic lanes in each direction)
- Partial interchanges at Poplar Avenue and Peka Peka Road
- Full interchanges at Kāpiti Road and Te Moana Road
- Four lane bridge over the Waikanae River
- Grade separated overbridges and underbridges to cross local roads, watercourses and the Expressway.

The general locations of operational elements of the Project are described by chainages (i.e. distance measured in metres) along the Expressway alignment, with chainage 0m being the starting point at the southern end and chainage 18050m being the approximate end point at the northern end.

For ease of reference, the Expressway alignment has been divided into three zones. For construction management, these have been further divided in construction areas reflecting the construction activities to be undertaken. Table 1 below identifies each of these Zones and construction areas, along with the approximate chainages of each construction areas.

Table 1 – Construction Zones and Sections

Zone	Sub-section	Chainage (m)
South	Raumati Straight	0 – 1900
	Poplar Avenue Interchange	1900 – 3200
	Poplar Avenue to Raumati Road	3200 – 4400
	Raumati Road Bridge	4400 – 4550
	Raumati Road to Wharemauku Stream	4550 – 5350
	Wharemauku Stream Bridge	5350 – 5500
	Wharemauku Stream to Kāpiti Road	5500 – 6200
	Kāpiti Road Interchange	6200 – 6500
Central	Kāpiti Road to Mazengarb Road	6500 – 7900
	Mazengarb Road Bridge	7900 – 8000
	Mazengarb Road to Otaihanga Road	8000 – 9150
	Otaihanga Road Bridge	9150 – 9250
	Otaihanga Roundabout	N/A
	Otaihanga Road to Waikanae River	9250 – 10500
	Waikanae Bridge	10500 – 10750
	Waikanae River to Te Moana Road	10750 – 11500
North	Te Moana Road Interchange	11500 – 12350
	Te Moana Road to Ngarara Road	12350 – 13500
	Ngarara Road	13500 – 13700
	Smithfield Road	13700 – 15400
	15400 to Peka Peka	15400 – 16600
	Peka Peka Interchange	16600 – 18050

1.4 Location plans

Figure 1 shows an overall plan of the alignment.

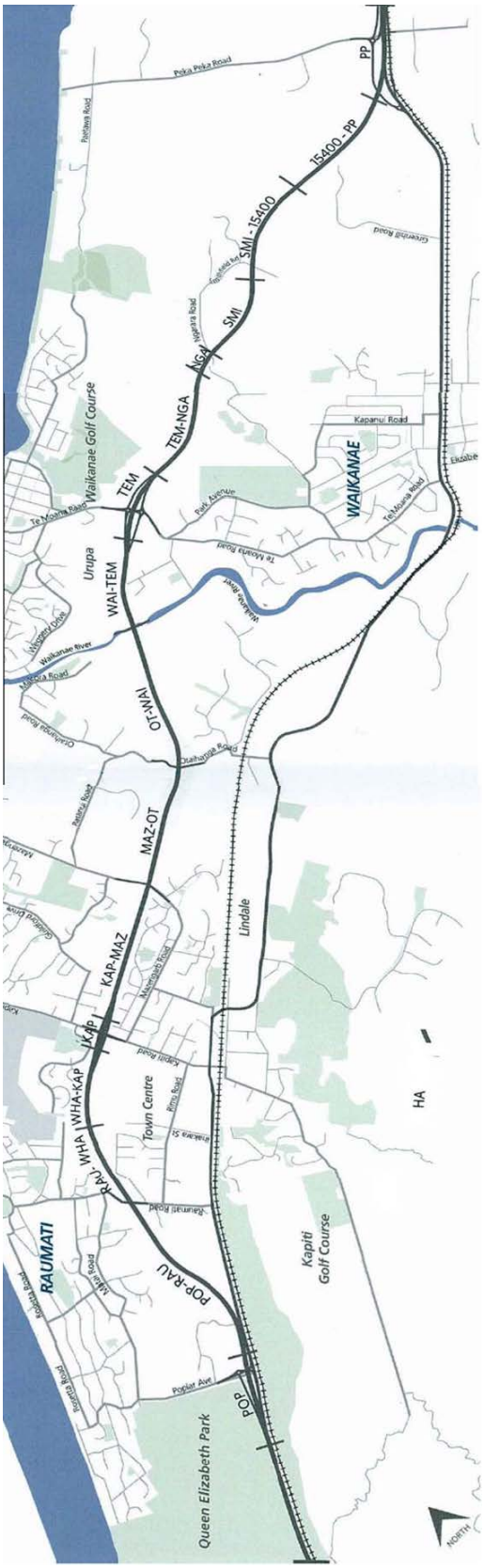


Figure 1 - Overall Plan

1.5 Environmental performance standards

It is the objective of the CAQMP that all work will be undertaken in a manner that ensures compliance with all regulatory requirements. The requirements of the regulations have a common aim, which is to avoid, remedy, or mitigate adverse effects on the environment, including effects on the health of people and ecosystems and amenity effects.

In order for the construction of the Project to comply with all statutory requirements, the discharge of dust, odour, or hazardous air pollutants from this site must comply with the following key conditions of the Designation:

DC.25 *a) In managing dust arising from construction activities, the Requiring Authority shall achieve the following outcome:*

i) Earthworks are managed to minimise the amount of dust received offsite.

b) In achieving this outcome, the Requiring Authority shall comply with the following standard:

i) The 24-hour average concentration, measured midnight to midnight, of Total Suspended Particulate (TSP) at any point within 100 m of the designation boundary that adjoins a highly sensitive air pollution land use does not exceed 80 micrograms per cubic metre (µg/m³).

For the purpose of these conditions, highly sensitive air pollution land uses" shall be as defined in Table 6.2 of the Good Practice Guide for Assessing Discharges to Air from Land Transport, Ministry for Environment, 2008 which includes hospitals, schools, childcare facilities, rest homes, residential properties, open space used for recreation as well land used for tourist, cultural and conservation land uses.

DC.28 *Unless expressly provided for by conditions of this designation, there shall be no odour, dust or fumes beyond the designation boundary caused by discharges from the site which, in the opinion of an enforcement officer, is noxious, offensive or objectionable.*

DC.29 *Beyond the designation boundary, there shall be no hazardous air pollutant caused by discharges from the site that causes, or is likely to cause, adverse effects on human health, environment or property.*

1.6 Roles and responsibilities

All personnel working on the Project have responsibility for achieving compliance with the environmental performance standards. Specific responsibilities include the following:

All Site Staff (Alliance staff and contractors)

- Attend inductions, tool box talks and training to manage dust and odours (section 5)
- Observing and reporting dust or odour discharges, whether or not these lead to off-site effects (section 4)
- Reporting all incidents involving dust and odours (section 4)
- Ensuring processes for managing dust and odour are understood and adhered to (section 3).

Environmental Manager

- Review and update CAQMP (section 7.2)
- Monitor and report performance against the CAQMP (section 7.1)
- Ensure regular visual monitoring of the site is undertaken by environmental team, foremen and superintendents (Table 8);
- Coordinate the installation and set-up of mobile dust monitoring equipment in conjunction with the Construction Team (section 4.5).
- Review continuous dust monitoring locations based on locations of nearby sensitive receptors (within 100m) in conjunction with the Project air Quality Advisor (section 4.5).
- Investigation and reporting of all complaints (section 6).

Alliance Project Manager

- Ensure sufficient resources are provided to manage dust and odour in accordance with the CAQMP; and
- Provide leadership to the Project team in the area of dust and odour management.

1.7 Contact details

A project contact list detailing all key staff and project specialists is included in the CEMP at Appendix F.

2 Environmental aspects

2.1 Environmental impacts summary

The potential environmental impacts of the construction activities include:

- Dust arising from construction activities, vehicle movements and wind entrainment from unsealed surfaces
  - The main issues relate to the visual soiling of clean surfaces, such as cars, window ledges, and household washing; dust deposits on flowers, fruit or vegetables; and the potential for contamination of roof-collected water supplies. Excessive discharges of dust may also impact on visibility on roads.

  - Due to the relatively large size of construction dust particles, only areas within about 100m of the construction footprint are likely to be at high risk of significant exposure to dust discharges.
- Hazardous air pollutants (HAPs) from the disturbance of contaminated soils and construction vehicle exhaust emissions
  - Several contaminated sites have been identified along the route of the Project (55 Rata Rd and the Kāpiti Road Intersection).
  - Engine exhaust emissions from construction vehicles contain a range of hazardous air pollutants, including fine particles, oxides of nitrogen, carbon monoxide and organics such as benzene, which can adversely affect human health. Poorly maintained vehicle engines discharge many times the amount of air pollutants than well maintained engines; and unnecessary idling of vehicle engines while parked can also cause significant local effects.
- Odour from the disturbance of contaminated soils
  - Depending on the nature of the contamination, there may be odour when contaminated soils are disturbed. Based on results of investigations to date, nuisance odour is considered unlikely to be an issue.

2.2 Activities and receiving environments

Table 2 to Table 4 present a summary of the construction activities in each zone that have the potential to generate dust or HAPs for the period July 2013 to June 2014, along with sensitive receptors in the vicinity of each of those activities. In addition to the activities listed in these tables, the following discharges are likely to occur whenever construction activities are being undertaken:

- Dust from vehicles accessing construction areas via haul routes; and
- HAPs in engine exhaust emissions from construction traffic.

Key sensitive receptors that must be taken into account when minimising dust are also shown in Table 2 below.

Table 2 – Construction activities with the potential to cause discharges into the air – Southern Section

Section	Activity	Discharge	Period	Sensitive receptors
Raumati Straight	Construction of cycleway in QE Park	Dust	July – Sept 2013	N/A
Poplar Avenue Interchange	Demolition and removal of buildings and services	Dust	July – Sept 2013	Residential premises along Poplar Avenue and Main South Road
	Ground improvements and preload embankment south of Poplar	Dust	July – Sept 2013	Residential premises along Poplar Avenue and Main South Road
	Movement of spoil by truck to preload site			
	Ground improvements and preload embankment north of Poplar	Dust	Oct – Dec 2013 Jan – Jun 2014	Residential premises along Poplar Avenue and Main South Road
	Movement of spoil by truck to preload site			
Poplar Avenue to Raumati Road	Realignment of Leinster Avenue	Dust	Oct – Dec 2013	Residential premises on Leinster Avenue and Main South Road
		Dust	Oct – Dec 2013	
Raumati Road Bridge	*TBA*			
Raumati Road to Wharemauku Stream	*TBA*			
Wharemauku Stream Bridge	*TBA*			
Wharemauku Stream to Kāpiti Road	*TBA*			
Kāpiti Road Interchange	*TBA*			

Table 3 – Construction activities with the potential to cause discharges into the air – Central Section

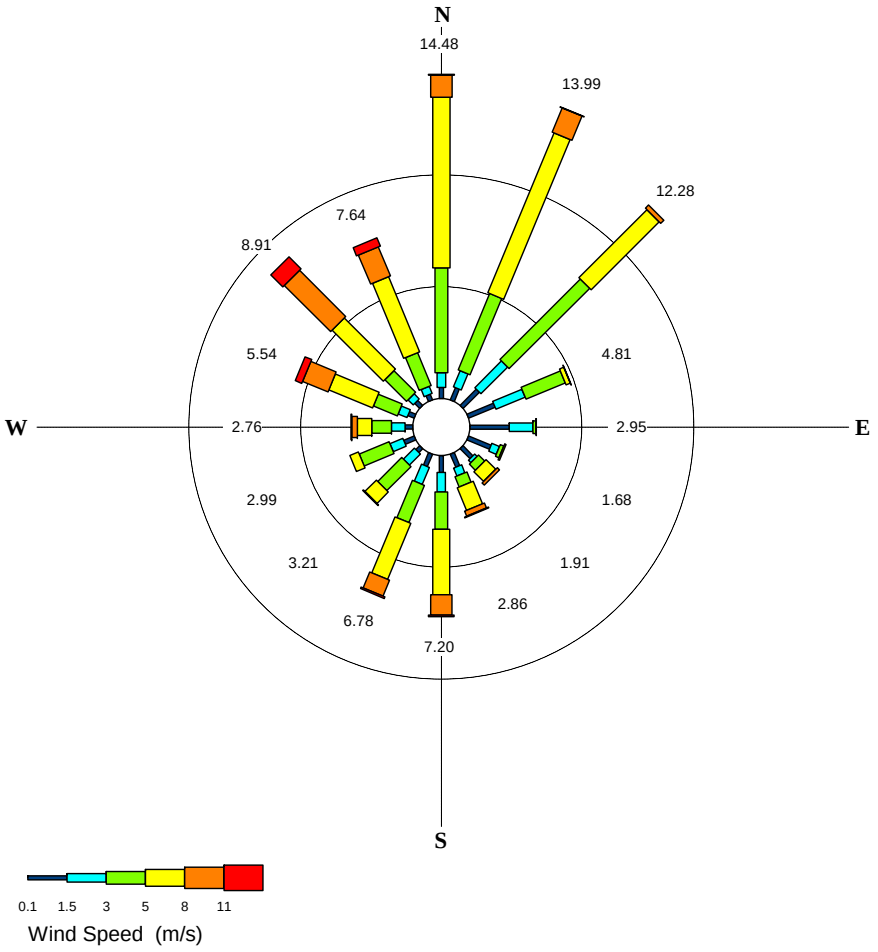
Section	Activity	Discharge	Period	Sensitive receptors
Te Moana Road Interchange	Enabling works for gas main diversion	Dust	Oct – Dec 2013	Houses on Te Moana Rd
Te Moana Road to Ngarara Road	Expressway construction			Properties on Ferndale Drive and Te Heke Place; 205, 206 and 269 Ngarara Road; 29 and 37 Smithfield Road; 160 Greenhill Road
Ngarara Road	*TBA*			
Smithfield Road	Drainage works	Dust	Jan – Mar 2014	
	Expressway construction	Dust	Apr – Dec 2014	
15400 to Peka Peka	Preload embankment Movement of spoil by truck	Dust	July – Sept 2013	
	Drainage and streamworks	Dust	Jan – Mar 2014	
	Earthworks Construction of Kakariki bridge Construction of Paetawa bridge Movement of spoil by truck	Dust	Apr – Jun 2014	
Peka Peka Interchange	*TBA*			

Table 4 – Construction activities with the potential to generate discharges into the air – Northern Section

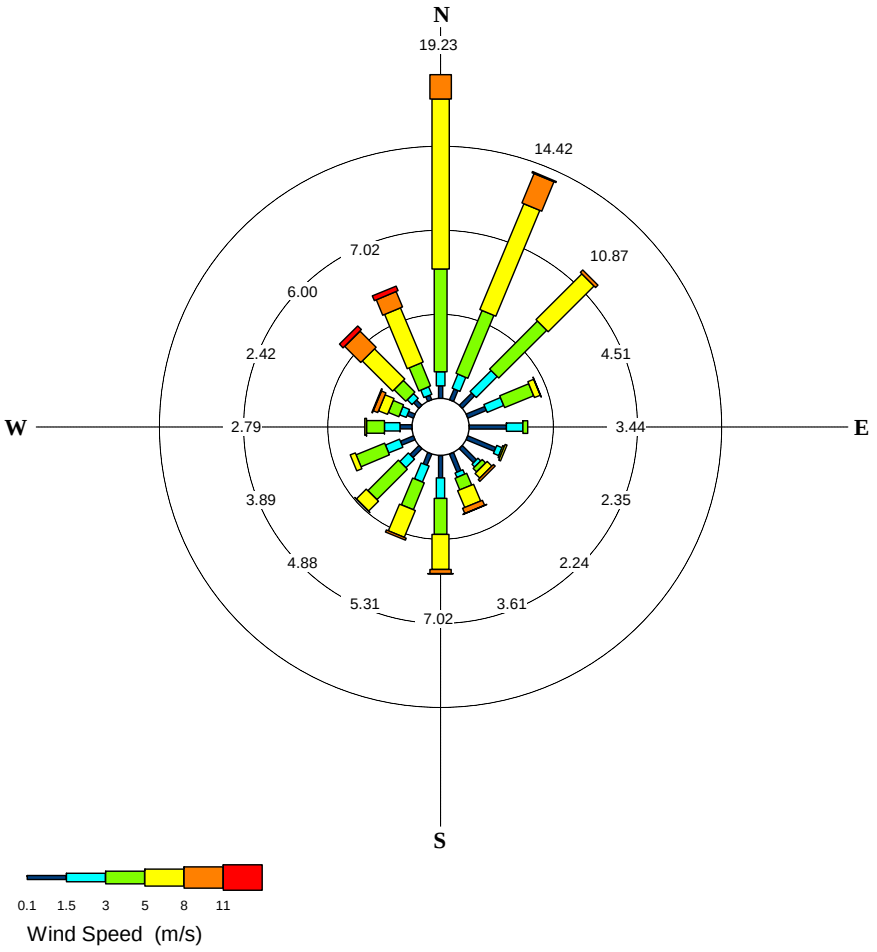
Section	Activity	Discharge	Period	Sensitive receptors
Kāpiti Road to Mazengarb Road	*TBA*		Jan – June 2015	
Mazengarb Road Bridge	*TBA*		Jan – June 2015	
Mazengarb Road to Otaihanga Road	*TBA*		Jan – June 2015	
Otaihanga Road Bridge	Construction of Otaihanga Road bridge	Dust	Apr – Jun 2014	Properties on Otaihanga Road
Otaihanga Roundabout	Construction of Otaihanga Roundabout	Dust	July –Sept 2013	239 Main Road South
Otaihanga Road to Waikanae River	Preload embankment Construction of haul route from Otaihanga Road to Waikanae	Dust	Oct – Dec 2013	Properties on Killalea Place, Otaihanga Road, Grand Poppa Way and Sea Poppy Way.
	Movement of spoil by truck			
	Construction of haul route from Otaihanga Road to Waikanae	Dust	Jan – Mar 2014	Properties on Otaihanga Road, Grand Poppa Way and Sea Poppy Way.
	Movement of spoil by truck			
Waikanae Bridge	Construction of Waikanae bridge	Dust	Jan – Jun 2014	El Rancho
Waikanae River to Te Moana Road	Demolition and removal of buildings and services	Dust	July – Sept 2013	Properties on Puriri Road and Kauri Road
	Enabling works for gas main diversion	Dust	Oct – Dec 2013	Properties on Puriri Road and Kauri Road

2.3 Meteorology

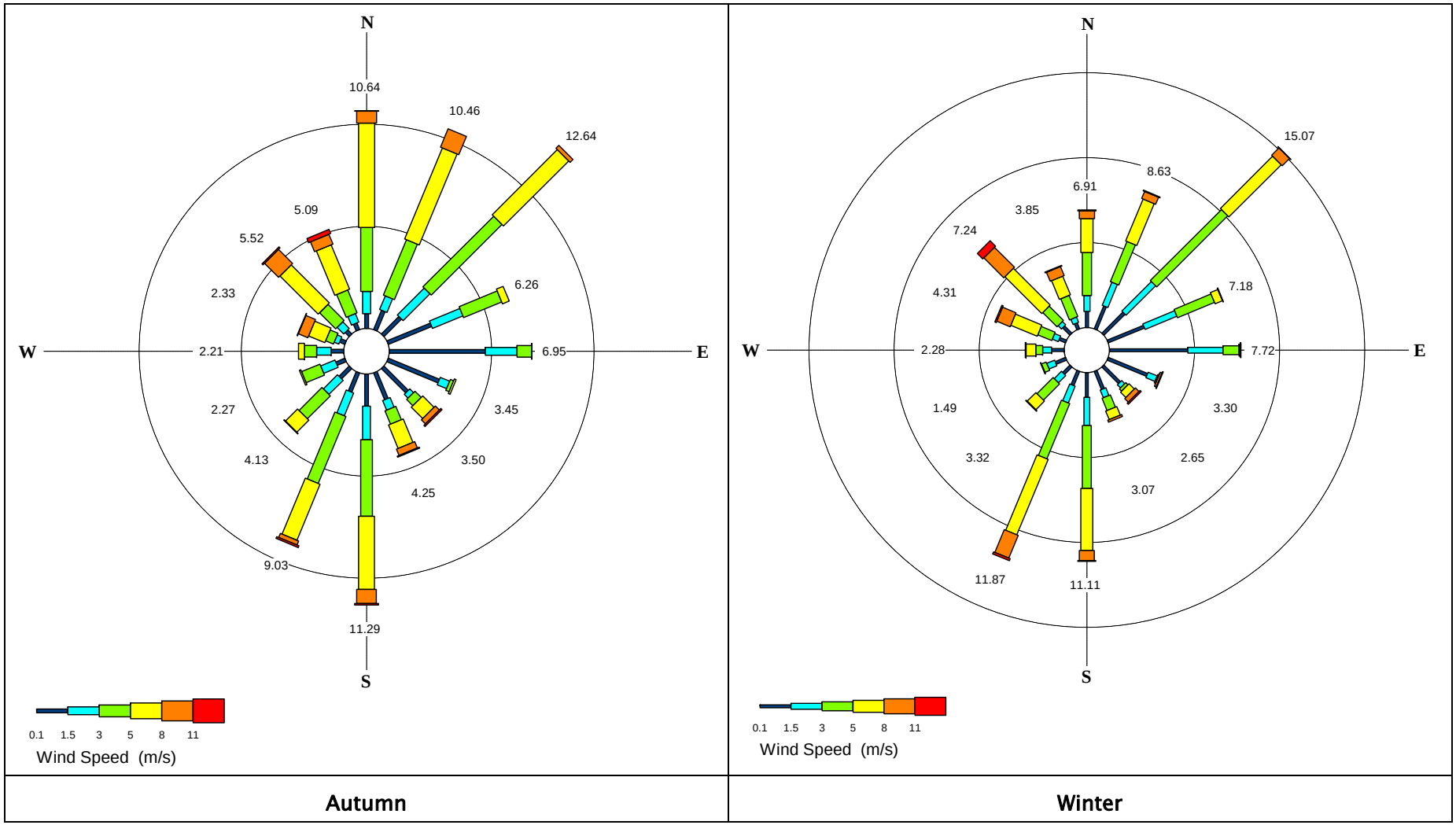
Prevailing winds on the Kāpiti Coast are from the north to northeast and, to a lesser extent, the southwest. These prevailing winds vary with season, with northerly winds dominant during the summer and northeasterly in the winter. The highest wind speeds tend to occur when the wind is from a northwesterly direction, especially during spring (e.g. Spring Equinox) and summer. In consequence, properties to the south and/or southwest of the construction footprint have a higher risk of exposure to dust emissions than those to the northwest. Figure 2 below illustrates the seaonsal prevailing winds as 'wind roses'.



Spring



Summer



Autumn | **Winter**

Figure 3 – Seasonal wind roses – Paraparaumu Airport

3 Operating/management procedures

3.1 Dust

3.1.1 Factors influencing dust generation

Standard procedures for controlling potential dust nuisances are specified in Fletcher Standard Operating Procedure (SOP) ENV-13 Dust Nuisance. This section of the CAQMP provides further explanation of the causes of dust nuisance and of methods that may be used to control dust discharges.

Potential sources of dust and other air contaminant discharges which may cause nuisance beyond the site boundary during adverse conditions if adequate controls and mitigation measures are not adopted are:

- Dust from roads and access areas generated by trucks and other mobile machinery movements during dry and windy conditions;
- Excavation and disturbance of dry material;
- Loading and unloading of dusty materials to and from trucks;
- Stockpiling of materials including material placement and removal;
- Storage and handling of bulk cement; and
- Concrete grinding undertaken as part of the manufacture of pre-cast concrete bridge components.

Of these, the most significant sources of dust are likely to be from unstabilised, dry, exposed surfaces such as stockpiles, unsealed haul roads and open earthworks (excavations and embankments), particularly in areas of sandy soil. This list of activities with significant potential to generate dust will be reviewed on a regular basis by the Environmental Manager.

There are five primary factors which influence the potential for dust to be generated from the site. These are:

- **Wind speed across the surface**. Dust emissions from exposed surfaces generally increase with increasing wind speed. However dust pick up by winds is only significant at wind speeds above 5m/s (11 knots or a Beaufort scale number of 3 – see Appendix A of this Plan). Above wind speeds of 10m/s (20 knots) dust pick up increases rapidly (Beaufort Scale 6). Wind speed is used as a trigger (refer Table 6).
- **Moisture content of the material**. Moisture binds particles together, preventing them from being disturbed by winds or vehicle movements. Similarly, vegetated surfaces are less prone to wind erosion than bare surfaces.
- **The area of exposed surface**. The larger the area of exposed surfaces the more potential there will be for dust emission.

- **The percentage of fine particles in the material on the surface**. The smaller the particle size of material on an exposed surface the more easily the particles are able to be picked up and entrained in the wind.
- **Disturbances such as traffic and loading and unloading of materials**. Vehicles travelling over exposed surfaces tend to pulverise any surface particles. Particles are displaced from rolling wheels and the surface. Dust is also sucked into the turbulent wake created behind moving vehicles.

Systems for controlling dust emissions include:

- Methods that modify the condition of the materials (e.g. use of water sprays) so that it has a lesser tendency to lift with the wind or disturbances such as vehicle movements;
- Methods that minimise the extent of unsealed areas; and
- Methods that reduce the velocity of the wind at the surface (e.g. the use of wind breaks).

Watering of exposed surfaces and materials that may be disturbed is a primary method of control ("wet suppression"). The two main soil types within the Project area present contrasting challenges when considering the use of wet suppression:

- Sand – fast drying, free draining; high risk of dust generation at all times; and
- Peat – high water retention, but very hard to re-wet once dry; moderate risk of dust generation during extended dry periods.

As a general guide, the typical water requirements for most parts of New Zealand are up to 1 litre per square metre per hour[1]. Watering of surfaces is most effective when the water is applied prior to strong winds occurring and prior to particularly dusty activities commencing (which therefore requires that weather forecasts are checked on a daily basis). In certain areas, polymer additives may be used in water sprays to assist the formation of a surface crust, particularly for exposed surfaces that will be undisturbed for periods of up to a month or two.

The discharge of dust from the Project has the potential to have effects on two scales:

- Individual sources where the effects of dust discharges are localised in the immediate area surrounding the construction area.
- Cumulative effects where the dust generated from all nearby dust sources combine to affect local air quality as a whole.

[1] Section 8.2 of the MfE Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions, Ministry for the Environment, 2001

Therefore it is important that all dust sources be minimised as far as practicable, including those well separated from sensitive locations, as all dust generated will have an effect on the overall air quality in the area.

3.1.2 Dust sources and controls

The dust prevention methods summarised in Table 5 below will be employed to achieve compliance with Conditions DC.25, DC.28 and DC.29 of the designation.

Table 5 – Dust mitigation measures

Source of Dust	Control
General measures	▪ Ensure sufficient water is available on site and consider locations of water bores/storage where possible to minimise haul distances for water carts. – 'Sufficient water' generally means enough water to prevent dust generation – Water suppression will be maintained during non-working periods (e.g. Christmas shutdowns) to avoid dust generation during these periods. ▪ Take account of daily forecast wind speed, wind direction and soil conditions before commencing an operation that has a high dust potential. ▪ Avoid disturbing exposed or unsealed areas or stockpiles during very dry, windy conditions. ▪ Minimise the area of surfaces covered with fine materials. ▪ Consider installing windbreak fences where practicable and appropriate[2].
Stockpiles (including material placement and removal)	▪ Limit the height and slope of stockpiles to reduce wind entrainment. Stockpiles exceeding 3m in height have a higher risk of discharging dust. ▪ Orientate stockpiles to maximise wind sheltering as much as possible. ▪ Maximise shelter from winds as far as practicable. ▪ Keep the surfaces of active stockpiles damp at all times or cover stockpiles of fine materials. ▪ Dampen inactive stockpiles if they are producing visible dust emissions. ▪ Use polymer additives to assist in forming a surface crust or

[2] Effectiveness of windbreak fences is greatest where fencing is perpendicular to the prevailing wind direction with a porosity of about 50%.

Source of Dust	Control
	cover with mulch and straw. ▪ Vegetate stockpiles if inactive for more than three months. Supply adequate water to support optimum vegetation growth.
Unpaved surfaces such as roads and yards	▪ Limit the amount of exposed surfaces as much as possible. ▪ Retain as much vegetation as possible. ▪ Contractor's yards in the vicinity of sensitive receptors will be surfaced with a clean compacted aggregate to prevent these areas generating dust. ▪ Compact all unconsolidated surfaces where practicable and if project trigger levels are exceeded (Table 7). ▪ Regularly maintain roads by grading and the laying of fresh gravel. ▪ In very high risk areas, haul roads should be sealed. ▪ Keep unpaved roads and exposed surfaces damp at all times when project trigger values are exceeded (Table 7). ▪ Stabilise all exposed surfaces and cleared areas not immediately required for construction, access or parking. –Methods may include wetting with polymer additives to facilitate crusting, metalling, grassing, mulching or the establishment of vegetative cover.
Sealed Surfaces	▪ Regular removal of dust through washing or vacuum sweeping.
Vehicles	▪ Limit vehicle speeds on unsealed surfaces to 20 km/h in all areas and reduce speed to 10 km/hr when project trigger levels are exceeded (Table 7). ▪ Limit load sizes to avoid spillages. ▪ Cover loads of fine materials. ▪ Minimise travel distances through appropriate site layout and design. ▪ Minimise mud and dust track out from unsealed areas by: – Establishing stabilised entranceways where required. – Provision of wheel wash facilities at road exits from construction areas if required.
Earthmoving and construction	▪ Adequate sprinkler systems (or water carts) to dampen areas shall be used at all times where practicable and when project trigger levels are exceeded (Table 7). ▪ Minimise the exposed areas of earthworks, e.g. by – covering exposed excavations with hay or mulch as soon as practicable – Progressively establishing the profile of preloading and

Source of Dust	Control
	covering exposed surfaces with hay or mulch as soon as practicable. ▪ When loading trucks, material will be dropped from as low as possible within the tray of the truck. ▪ Prior to a cut and fill activity in sand, pre-water the area with sprinklers to allow time for penetration of the soil.

3.1.3 Contingency measures and process malfunctions – dust

A process malfunction will most likely be identified as a result of a complaint to the project regarding dust or odour emissions beyond the site boundary. Should a complaint be received as a result of a process malfunction, the complaint process will initially be followed and closed out as per Section 6 of this plan. In the event that the cause is a process malfunction, an environmental incident report will also be raised and completed.

In the event that standard dust control measures are insufficient to adequately control dust discharges and/or there is a process malfunction that leads to or may lead to excessive dust discharges (e.g. an interruption to water supply), the [Environmental Manager] will initiate appropriate contingency measures. Examples of such process malfunctions and contingency measures are presented in Table 6.

Table 6 – Contingency measures – dust

Incident/process malfunction	Examples of response
Dust generating activities to be undertaken immediately adjacent to highly sensitive receptors	▪ Install windbreak fences where practicable ▪ Dampen all exposed areas of soil.
Dust discharges cause excessive deposition / soiling beyond site boundary	▪ Works in the immediate vicinity will be ceased until appropriate response measures have been agreed upon between the engineer responsible for the works, the Construction Manager and the Environmental Manager ▪ Environmental Manager will liaise with the relevant regulatory manager (and/or the affected party) to establish what remediation is required (refer CEMP). ▪ Remediation measures may include: –Cleaning of roof water tanks and replenishment of water supplies –Cleaning of houses –Cleaning of other buildings and infrastructure –Cleaning of local roads (in agreement with the Council's Road Asset Manager).

Incident/process malfunction	Examples of response
Breakdown of fixed water sprays	▪ Utilise additional water carts ▪ Modify activities to reduce likelihood of dust discharges ▪ Reduce vehicle speeds on unsealed roadways to 10 km/h
Breakdown of water cart	▪ Obtain temporary replacement water cart from external provider ▪ Reduce vehicle speeds on unsealed roadways to 10 km/h
Failure to follow project procedures for operating in windy conditions	▪ An environmental incident will be logged and the required incident form completed. The process for this is detailed in the CEMP.
Forecast of high winds (>5.5 m/s or 20 km/h – moderate breeze)[3]	▪ Ensure resources (fixed sprays and/or water carts) are in place to dampen stockpiles and uncovered areas of soil.
Visible dust discharges from stockpiles and uncovered areas of soil	▪ Apply water suppression as necessary ▪ Apply additional water suppression to unsealed haul roads
High winds (>10 m/s or 36 km/h – strong breeze[4])	▪ Increase water application rate for dust suppression ▪ Cease tipping materials if carrying out dust generating activities within 100 metres upwind of houses/sensitive receivers. ▪ Avoid driving on unsealed roads where possible.

3.2 Contaminated soils

3.2.1 Discharge sources and controls

Where contaminated soils are known to be or are likely to be present, the main air quality risk arises through discharges of contaminated dust that, in addition to nuisance impacts, may also cause adverse effects on human health. These effects may occur either through direct inhalation or through ingestion – i.e. eating produce or drinking water that has been contaminated by dust from the contaminated site.

Similar measures are appropriate for the control of discharges from contaminated sites as for general dust discharges. Soils should be adequately wetted and dust controlled during any removal of the contaminated soil. If the excavations require these layers of

[3] Beaufort scale 4: Moderate breeze = Dust and loose paper raised. Small branches begin to move

[4] Beaufort scale 6: Strong breeze = Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic garbage cans tip over.

contamination to be removed, dust control measures should take potential risk from contamination into consideration and precautions put in place to ensure that contaminants are not discharged from the site. Once the contaminated soil is removed, standard construction dust control measures should be applied.

Reference should also be made to the Contaminated Soils and Groundwater Management Plan Appendix M of the CEMP) for additional controls related to the safe handling of contaminated or potentially contaminated soils.

3.2.2 Contingency measures – contaminated soils

Prior to earthworks commencing on a known contaminated site, occupiers of neighbouring premises should be notified of the planned scale and duration of the works.

If significant discharges of dust occur from a known or suspected contaminated site and/or if the TSP trigger value specified in Table 11 is exceeded and the source of dust appears to be from construction activities within that site, all construction activities within that site must be ceased until additional control measures are in place.

Remediation measures to mitigate the effects of potentially contaminated dust on neighbouring premises may include:

- Advice to occupiers to wash garden produce prior to consumption.
- Cleaning of roof water tanks and replenishment of water supplies.

3.3 Odour

3.3.1 Odour sources and controls

General odour monitoring procedures are described in section 4.3.

Discharges of odour may occur from the disturbance of contaminated soils. Odour emissions are to be monitored during excavation of such material and the following techniques utilised if necessary:

- Limiting the time that the odorous material in the excavation is exposed
- Covering the material at the end of the day
- Removing excavated odorous material from site as quickly as possible
- The use of chemical counteractant sprays and/or odour fences.

If nuisance odour emissions are likely at any specific location (based on field observations during intrusive site investigations), chemical counteractant sprays (stabilised chlorine dioxide) must be available on site prior to breaking ground. These can be deployed either via point source sprayers or via odour fences (a series of spray nozzles mounted on poles, supplied from a single pump) and should be positioned upwind of the odour source.

3.3.2 Contingency measures – odour

If significant odour is detected and the odorous material cannot be removed quickly and chemical counteractant sprays or odour fences are not immediately available:

- The odorous material must be covered
- Work in that area will then be suspended until suitable mitigation measures are in place

3.4 Vehicle Exhaust Emissions

Poorly maintained vehicle engines discharge many times the amount of air pollutants than well maintained engines; and unnecessary idling of vehicle engines while parked can also cause significant local effects. In consequence, the following key actions should be carried out to minimise emissions:

- All construction machinery used on the site must be maintained at least in accordance with manufacturers' requirements.
- Where excessive exhaust smoke is identified from any construction vehicle, that vehicle should be serviced as soon as is practicable and taken out of use until such maintenance has been completed.
- Construction vehicles should not be left idling while parked or unattended.
- All fleet vehicles must be regularly serviced.
- An awareness programme will be undertaken by the Environmental Team to address any issues should idling vehicles be identified as an issue.

4 Monitoring

4.1 Trigger levels for dust

Condition DC.25(b) of the designation requires that the concentration of total suspended particulate matter (TSP) does not exceed 80 µg/m^3 at any sensitive receptor within 100m of the designation boundary.

In order to meet the performance requirements detailed above, a number of Project-specific trigger values have been specified, as set out in Table 7.

Table 7 – Project trigger values*

Trigger	Averaging Period	Sensitivity of Receiving Environment #		
		High	Moderate	Low
Short Term TSP threshold**	1-hour	200 µg/m³	250 µg/m³	N/A
Daily TSP threshold**	Rolling 24-hour	60 µg/m³	80 µg/m³	N/A
Wind warning level	1-minute	▪ Gust wind speeds exceed 10 m/s during two consecutive ten minute periods, and ▪ there has been no rain in the previous 12 hours.		
Visible dust	Instantaneous	Visible dust crossing site boundary		

* These values will be reviewed for each monitoring site

** Dust concentration

\# Refer to the 'Human Health and Nuisance' map series for information on the sensitivity of the receiving environment. In general, all residential areas will be high sensitivity.

The Project trigger levels shown in Table 7 above are intended to trigger internal investigation and reporting, with the aim of avoiding breaches of the designation conditions. Frequent breaches of the Project trigger values without corresponding breaches of the conditions would indicate that the Project trigger values are set too low. Conversely, frequent complaints regarding dust in areas where TSP concentrations are being monitored, without corresponding breaches of the trigger levels, may indicate that the trigger levels are too high.

As part of the response to breaches of these trigger values, increased application of water and/or modifications to or temporary cessation of construction activities may be required (refer Table 5).

4.2 Visual dust monitoring

Table 8 outlines the visual dust monitoring programme that is to be implemented.

Table 8 – Visual dust monitoring programme

Monitoring Activities	Frequency
Check weather forecasts for strong winds and rainfall to plan appropriate dust management response (7 day forecasts available on www.metvuw.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.	Three times daily
Inspect stockpiles to ensure enclosure, covering, stabilisation or dampness. Ensure stockpile height is less than 3m or appropriately stabilised.	Weekly and at times of expected high winds
Inspect dust generating activities (as listed in section 3.1 – Table 4) to ensure dust emissions are effectively controlled.	Regularly throughout the day and as new activities are commenced
Inspect watering systems (sprays and water carts) to ensure equipment is maintained and functioning to effectively dampen exposed areas.	Weekly
Additional monitoring of dust generating activities and water application rate.	In winds over 5.5 m/s (11 knots or a Beaufort scale number of 3 – see Appendix A of this Plan)
Inspect site access and egress points to ensure effective operation of wheelwash/truckwash systems and/or judder bars (if installed).	Weekly
Ensure site windbreak fences, if used, are intact.	Weekly

4.3 Odour monitoring

Odour monitoring will be required if:

- Significant odour discharges occur (i.e. offensive odour is observed during earth moving)

- While contaminated soils are being excavated and loaded into trucks
- There are complaints regarding odour from construction activities.

This should take the form of 'odour scout' monitoring[5] along the site boundaries between the suspected source(s) and sensitive receptors as well as upwind of the suspected source(s). The aim of this monitoring is to assess the effectiveness of odour control and mitigation measures.

4.4 Construction vehicle maintenance

Plant and machinery operators are required to complete weekly check sheets of their equipment to identify and address any faults and servicing requirements. These sheets are collated by the project management team and actioned as necessary.

Drivers of fleet vehicles are responsible for ensuring that these vehicles are regularly serviced.

4.5 Instrumental dust monitoring

4.5.1 Monitoring conditions

Condition DC.25A requires continuous monitoring of TSP concentrations at least four locations as follows:

- Sector 1 – at least one site
- Sector 2 – at least 2 sites
- Sector 3 – at least one site

For construction management purposes, the Project has been divided into zones, sections and subsections rather than sectors. Table 9 lists the construction sections that correspond to each of the three Sectors referred to above.

[5] 'Odour scout' monitoring involves a person periodically checking for odour downwind of a site. The odour scout must not be someone who works on the specific site, because they may be desensitised to the odour, but should be someone who is aware of the types of odour that may arise from the site.

Table 9 – Construction Sections in Sectors 1, 2 and 3

Sector 1	Sector 2	Sector 3
Poplar Avenue Interchange	Raumati Road to Waremauku Stream	Mazengarb Road to Otaihanga Road
Poplar Avenue to Raumati Road	Waremauku Stream Bridge	Otaihanga Road Bridge
Raumati Road Bridge	Waremauku Stream to Kāpiti Road	Otaihanga Road to Waikanae River
	Kāpiti Road Interchange	Waikanae River to Te Moana Road
	Kāpiti Road to Mazengarb Road	Te Moana Road Interchange
	Mazengarb Road Bridge	

This monitoring must be undertaken for at least one week at each site between 1 October and 30 April while construction activities are being undertaken within 100m of a designation boundary that adjoins 'highly sensitive air pollution land uses'.

Specific monitoring locations will be reviewed on a weekly basis by the Environmental Manager in conjunction with the Project Air Quality Advisor and KCDC, taking into account the following:

- The requirements of AS/NZ 35801.1:2007 Methods for sampling and analysis of ambient air – guide to siting of air monitoring equipment
- Construction activities to be undertaken in each sector
- Locations of nearby highly sensitive air pollution land uses
- Complaints regarding dust emissions from the Project.

The KCDC representative will be invited to these weekly reviews and also asked to verify compliance with the monitoring requirements of DC.25A.

Condition DC.25B requires continuous monitoring of meteorological parameters (wind speed and direction, temperature and rainfall) at one or more locations that is/are '*representative of local weather conditions across the construction site*'.

The approximate locations where continuous monitoring of TSP and of meteorological conditions will be undertaken during the first 2 years of construction of the Project are listed in Table 10. As the monitors will be portable, the exact location of the monitoring sites may be varied as appropriate to respond to changes in construction activities and methods or to complaints regarding dust discharges.

The Environmental Manager, will be responsible for the provision and maintenance of the instrumental monitoring.

Table 10 – Dust monitoring locations

Monitoring Season (DC.25A)	Zone	Construction period	Approximate Monitoring location
Oct 2013 – Apr 2014	1	Jan – Mar 2014	Near 114 or 109 Leinster Avenue
	2		N/A
	3	Oct – Dec 2013	TBC
Oct 2014 – Apr 2015	1	Oct – Dec 2014	Poplar Avenue
	2	Jan – Mar 2015	Near 96 or 98 Kāpiti Road
			Near 345 Mazengarb Road
	3	Oct – Dec 2014	TBC

Two TSP monitoring instruments will be available, which will be located for extended periods in the vicinity of potentially dust-generating activities.

Additional monitoring may also be undertaken in response to complaints regarding dust discharges from the Project.

4.5.2 Monitoring instruments

A meteorological station which measures wind direction, wind speed and temperature is located at the main Otaihanga Project Office. Each real-time TSP monitoring site also includes meteorological monitoring (wind speed and wind direction).

The locations selected for the TSP and meteorological monitoring sites should be selected in general accordance with the requirements of:

- AS/NZ 3580.1.1:2007 Method for Sampling and Analysis of Ambient Air – Guide to Siting Air Monitoring Equipment; and
- AS 2923:1987 Ambient Air – Guide for the Measurement of Horizontal Wind for Air Quality Applications.

Real-time TSP monitoring for the Project utilises Thompson Environmental Systems' QA Lite Particulate Monitors, each fitted with a TSP Inlet and a Lufft Compact Weather Station Sensor.

Sampling filters will be changed every seven days when sampling filters are in use (for monitoring of potentially contaminated sites). Paired filters will be sent to GNS Laboratory for gravimetric analysis.

The outputs from the TSP monitors and the meteorological stations will be monitored remotely by the Environmental Manager, and will produce an alarm (to mobile phones) when trigger values are approached.

Outputs from the monitors are continuously recorded.

4.6 Monitoring of hazardous air pollutants

Continuous TSP monitoring must be carried out at the sites specified in Table 11 while contaminated soils are being disturbed.

The monitoring procedures specified in section 4.3 above are to be used at these locations, except that filter samples are to be used and analysed for the specific parameter identified at each location and site-specific TSP trigger values are to be used for investigation and response. Site-specific TSP trigger values will be defined with the aim of avoiding the 24-hour average concentration of the specific hazardous substance exceeding the relevant air quality guideline (which are usually defined as annual average concentrations), based on the 90th percentile of measured concentrations of the hazardous substance at that site.[6]

Filter samples will be analysed by either GNS Science or R J Hill Laboratories.

Table 11 – Contaminated sites

Site	Parameter	Site-specific TSP trigger values	
		1-hour average	24-hour average
16 Leinster Avenue	Benzo(a)pyrene	TBC	TBC
150 Raumati Road	Benzo(a)pyrene & Lead	TBC	TBC
55 Rata Road	Benzo(a)pyrene, Arsenic & Chromium	TBC	TBC
58 Kiwi Road	Arsenic	TBC	TBC
109 Kāpiti Road	Benzo(a)pyrene & Arsenic	TBC	TBC

4.7 Contingency plan for ambient air instrument downtime

Instruments need to be shut down periodically for regular maintenance and from time to time the instruments fail. During these times, the following contingency plans should be implemented:

4.7.1 Planned Shutdowns

Where possible, planned maintenance should be carried out outside the monitoring periods required by the conditions (i.e. Oct to April inclusive). Planned maintenance of an

[6] Although the greatest risk of human exposure is likely to arise from ingestion of water or produce containing contaminated dust, air quality guidelines are typically based on lower (more conservative) exposure rates.

instrument must not be undertaken when the unit is being used to monitor dust from a contaminated site.

The instrument supplier will advise the Environmental Manager prior to shutting down a TSP instrument for regular maintenance. During the shutdown period, the following steps should be undertaken, unless it is raining steadily or the wind is less than 5m/s:

- In areas that sprinklers have been installed, turn on sprinklers on all potentially dusty surfaces whether or not dust is being generated. Do not turn sprinklers off until the instrument is back on line.
- Utilise water carts on all access roads and potentially dusty surfaces that are not covered by the sprinkler system whether or not dust is being generated until the instrument is back on line.

The instrument supplier will advise the Environmental Manager prior to shutting down the meteorological instruments. Readings from back-up sites at other locations within the Project area should be used while meteorological instruments are off-line.

4.7.2 Unplanned Shutdowns

Unplanned shutdowns can occur due to power failures and instrument faults. The instrument supplier will be required to alert the Environmental Manager of an instrument failure either via an automatic alarm or by phone.

As soon as site management becomes aware that one of the instruments has failed, the following steps should be taken unless it is raining steadily or the wind speed is less than 5m/s:

- In areas that sprinklers have been installed, turn on sprinklers on all potentially dusty surfaces whether or not dust is being generated. Do not turn sprinklers off until the instrument is back on line.
- Utilise the water cart on all access roads and potentially dusty surfaces that are not covered by the sprinkler system, whether or not dust is being generated, until the instrument is back on line.

If a power failure is the cause of the fault and there are no wind speed readings available, use the Beaufort Wind Scale to estimate wind speed. A copy of the Beaufort Wind Scale is attached to this plan as Appendix A. If winds exceed a force 2 wind (light breeze), the sprinklers should be activated. Alternatively, obtain wind speed and direction reports from other meteorological monitoring sites in the area (e.g. Paraparaumu Airport – data available via www.windfinder.com).

4.8 Response to TSP and meteorological triggers

Trigger levels for TSP and wind speed are summarised in Table 7 and Table 11. The following table (Figure 4) summarises the actions to be taken in the event that the results of instrumental monitoring exceed the specified Project trigger levels.

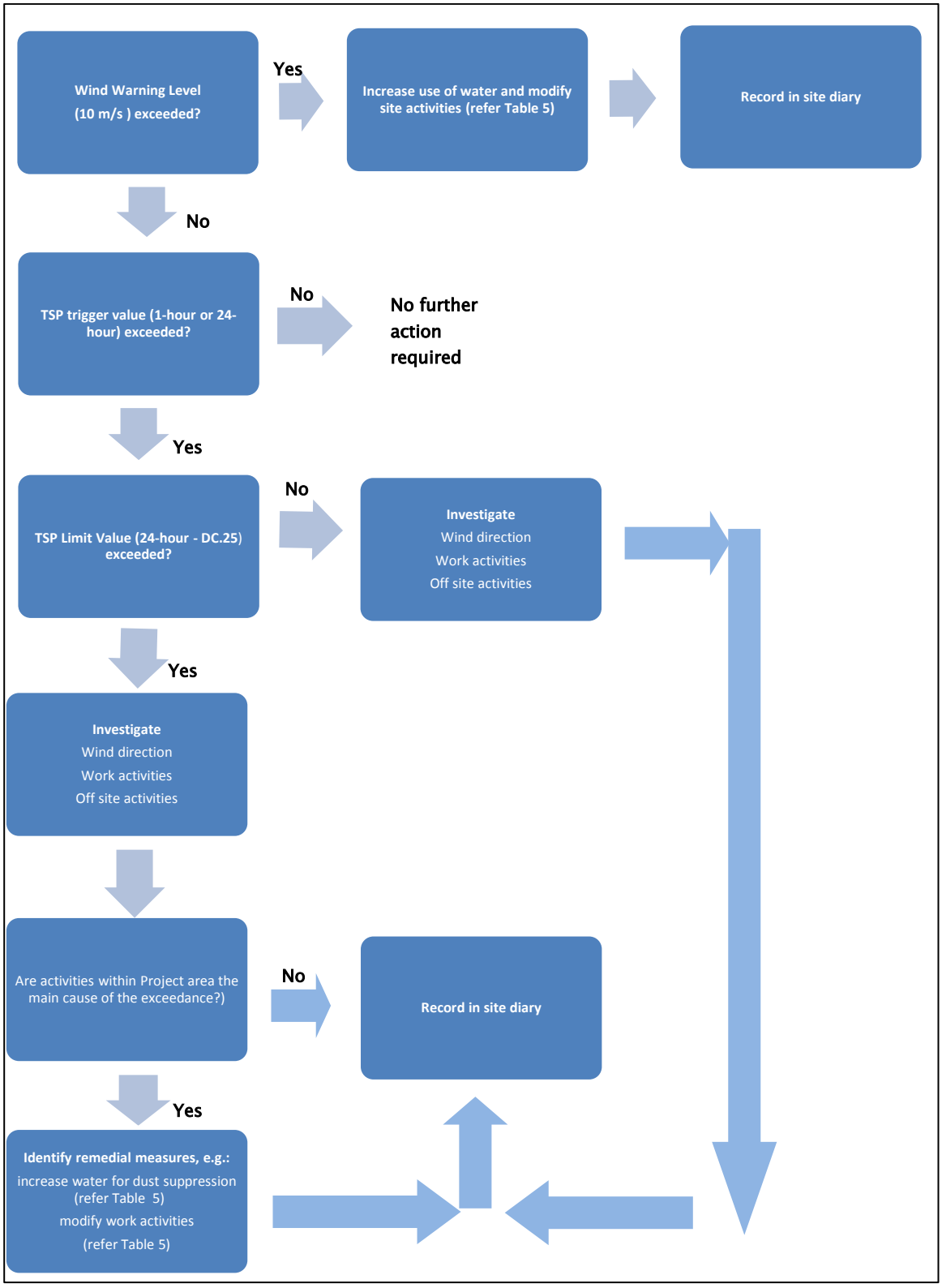


Figure 4 – Flow chart: Responses to Exceedances of Ambient Monitoring Trigger Values

4.9 Monitoring of Emission Control Equipment

Emission control equipment includes such items as fixed water sprays, water carts, odour fences and judder bars or wheelwashes at site exits. Effective operation of these systems is essential in minimising off-site effects.

Table 12 outlines the monitoring programme for emission control equipment. The implementation of this programme will be the responsibility of the Environmental Manager, in conjunction with site personnel.

Table 12 – Emission control equipment monitoring programme

Monitoring Activities	Frequency
Inspect watering systems (sprays and water carts) to ensure equipment is maintained and functioning to effectively dampen exposed areas.	Weekly
Inspect site access and egress points to ensure effective operation of wheelwash/truckwash systems and/or judder bars (if installed).	Weekly
Ensure site windbreak fences, if used, are intact.	Weekly
Inspect odour fences and odour sprays for correct operation and positioning and for sufficient fuel and odour neutraliser	Daily if used

5 Training

Environmental training for all staff will be undertaken as part of the site induction programme. Details of training are included in the CEMP. The environmental induction will include the following information specific to this Plan:

- Information about the activities and stages of construction that may cause dust and odour impacts within the construction area;
- Consent requirements;
- Complaints management procedures;
- Dust management procedures; and
- Description of dust and air pollutant 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.

6 Complaints

Complaints procedures are detailed in the CEMP. The procedure for managing complaints associated with dust or vehicle exhaust nuisance effects is detailed further below.

The Environmental Manager has the responsibility to respond to and follow up all complaints regarding dust or odour, and furthermore to ensure that suitably trained personnel are available to respond to complaints at all times.

Actions to be taken as soon as possible by the Environmental Manager:

- Fill out the appropriate complaint form.
- 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 the Regulatory Authority.
- As soon as possible after receipt of a complaint, undertake a site inspection. Note all dust or odour producing 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 or odour producing activities that were underway at that time. Initiate any remedial action necessary.
- As soon as possible (within 2 hours, where practicable), visit the area from where the complaint originated to ascertain if dust or odour is still a problem.
- If it becomes apparent that there may be a source of dust or odour 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 Documentation

7.1 Reporting

General reporting requirements are included in the CEMP. The specific reporting requirements associated with managing dust, odour and hazardous air pollutants include the following:

Site Staff to Environmental Manager

Site personnel shall inform the Environmental Manager of the following:

- Any problems they observe or foresee with dust management on their site
- The measures taken for dust prevention and mitigation during the previous reporting period.

Environmental Manager to Alliance Project Manager

The Environmental Manager will inform the Alliance Project Manager of the following:

- Any exceedances of dust trigger values, probable causes and actions taken
- The dust monitoring results each month
- Any complaints received during the previous period regarding dust and the remedial actions taken
- Any complaints received regarding dust, odour or hazardous air pollutants within 24 hours of receipt of the complaint.

Alliance Project Manager to the Project Alliance Board and Regulatory Authorities

The Alliance Project Manager will inform the Project Alliance Board and Regulatory Authority of the following:

- A log of any complaints received regarding dust or air pollutants and a summary the outcome of investigations into the causes of those complaints

The Environmental Manager, will provide the Regulatory Authority with a copy of the updated CAQMP if any significant revisions of the CAQMP are made.

7.2 Review

The CAQMP will be updated, with the necessary approvals, throughout the course of the Project to reflect changes associated with construction techniques or to the natural environment. A formal review process is described in section 5 of the CAQMP. Should changes to the construction methodology occur for any reason, the dust impacts will be reassessed and appropriate mitigation measures adopted as required.

A review of the CAQMP will be undertaken at least annually.

The reviews will take into consideration:

- Any significant changes to construction activities or methods
- Key changes to roles and responsibilities within the Project
- Changes in industry best practise standards or recommended dust controls
- Changes in legal or other requirements (social and environmental legal requirements, consent conditions, NZTA objectives and relevant policies, plans, standards, specifications and guidelines)

- Results of inspection and maintenance programmes, logs of incidents, corrective actions, internal or external assessments
- The outcome of investigations into discharges of dust/odour/air pollutants

Reasons for making changes to the CAQMP will be documented. A copy of the original CAQMP document and subsequent versions will be kept for the Project records, and marked as obsolete. Each new/updated version of the CAQMP documentation will be issued with a version number and date to eliminate obsolete CAQMP documentation being used.

Any relevant revisions to the CAQMP will be submitted to the Kāpiti Coast District Council (KCDC) for review at least 10 days before becoming operational.

8 References

Ministry for the Environment "Good Practice Guide for Air Quality Monitoring and Data Provision", 2009.

Ministry for the Environment "Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions", 2001.

Kirkby, C. Assessment of Construction Air Quality Effects: Technical Report 14, Volume 3 of the MacKays to Peka Peka Expressway Project AEE.

Ridley, G. Erosion and Sediment Control Plan: Appendix H of the CEMP, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Smith, G. Assessment of Land and Groundwater Contamination Effects: Technical Report 23, Volume 3 of the MacKays to Peka Peka Expressway Project AEE.

Smith, G. Contaminated Soils and Groundwater Management Plan: Appendix K of the CEMP, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Appendix A

Beaufort Wind Scale

Table A-1 – Beaufort Wind Scale

Beaufort Scale	Wind Speed			Label	Observations on Land
	m/s	knots	km/h		
0	0 – 0.2	<1	<1	Calm	Calm. Smoke rises vertically.
1	0.3 – 1.5	1 – 3	1 – 5	Light Air	Wind motion visible in smoke.
2	1.6 – 3.3	4 – 6	6 – 11	Light Breeze	Wind felt on exposed skin. Leaves rustle.
3	3.4 – 5.4	7 – 10	12 – 19	Gentle Breeze	Leaves and smaller twigs in constant motion.
4	5.5 – 7.9	11 – 15	20 – 28	Moderate Breeze	Dust and loose paper raised. Small branches begin to move.
5	8 – 10.7	16 – 21	29 – 38	Fresh Breeze	Branches of a moderate size move. Small trees begin to sway.
6	10.8 – 13.8	22 – 27	39 – 49	Strong Breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic garbage cans tip over.
7	13.9 – 17.1	28 – 33	50 – 61	Near Gale	Whole trees in motion. Effort needed to walk against the wind. Swaying of skyscrapers may be felt, especially by people on upper floors.
8	17.2 – 20.7	34 – 40	62 – 74	Gale	Twigs broken from trees. Cars veer on road.
9	20.8 – 24.4	41 – 47	75 – 88	Severe Gale	Larger branches break off trees, some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.
10	24.5 – 28.4	48 – 55	89 – 102	Storm	Trees are broken off or uprooted, saplings bent and deformed, poorly attached asphalt shingles and shingles in poor condition peel off roofs.

Beaufort Scale	Wind Speed			Label	Observations on Land
	m/s	knots	km/h		
11	28.5 – 32.6	56 – 63	103 – 117	Violent Storm	Widespread vegetation damage. More damages to most roofing surfaces, asphalt tiles that have curled up and/or fractured due to age may break away completely.
12	32.7 – 36.9	64 – 71	118 – 133	Hurricane	Considerable and widespread damage to vegetation, a few windows broken, structural damage to mobile homes and poorly constructed sheds and barns. Debris may be hurled about.

Appendix B

Independent Review Table

INDEPENDENT REVIEW OF Construction Air Quality Management Plan, version dated 23 April 2013
Independently Reviewed by: Dr Bruce W Graham, Graham Environmental Consulting Ltd, Auckland
Date of Independent Review: 2 May 2013
Signature of Independent Reviewer:

Condition Reference	*Independent Reviewer's comment*	*Page/paragraph/section reference within Management Plan*	*Management Plan Author's response*
DC.26(b) - subparts as listed below			
(i) Identification of sensitive locations where dust monitoring is proposed, and the specific methods for that monitoring, including trigger limits to determine when further action is required	The proposed monitoring locations are listed in table 8, but I am unable to say whether or not these are the most appropriate locations. There should be a specified process for involving the KCDC in site selection; for example s4.5.2 refers to weekly monitoring planning meetings - the KCDC should be invited to attend some of these. This may not be required by the designation but it would be a prudent management practice. The proposed method and trigger limiits are appropriate.	Locations - s 4.5.1 Method - s 4.5.2 Trigger limits - s 4.1	Noted. KCDC representative will be invited to the weekly meetings and also asked to verify compliance with the monitoring requirements of DC.25A
(ii) Identification of contingency measures to address identified and verified adverse effects on sensitive receptors	Covered at a very basic level through listing of the cleaning options given in 26(b)(ii). However there should also be an indication of the decision-making process for cleaning. At present it appears that this is to be solely at the discretion of the Environental Manager. Some sort of mediation process would be apppropriate to (a) manage excessive demands for cleaning and/or (b) minimise potential complaints of Consent Holder indifference.	s3.1.3, Table 6	Addressed in CEMP as follows: Works in the immediate vicinity will be ceased until appropriate response measures have been agreed upon between the engineer responsible for the works, the Construction Manager and the Environmental Manager Environmental Manager will liaise with the relevant regulatory manager to establish what remediation is required.
(iii) Visual monitoring of dust emissions	Adequately covered	S4.2 and Table 8	
(iv) Methods to be used to limit dust and odour nuisance	Adequately covered	Table 5 of s3.1.2 (dust) s3.3.3 (odour)	
(v) Procedures for responding to process malfunctions and accidental dust discharges	Adequately covered	s3.3.3 and Table 6 (dust)	
(vi) Criteria, including consideration of weather conditions and procedures for use of water sprays on stockpiles and operational areas of the site	Table 5 provides an extensive Toolbox of dust control options. However the specific decision-making criteria around their use are sometimes lacking. (eg. how much water is considered ''sufficient"; in what circumstances might wind fences be considered "appropriate'; how does anyone decide when they have limited exposed surfaces "as much as possible").	Table 5 of s3.1.2	Some description added around 'sufficient water. Windbreak fences are likely to be a 'final resort' if all other methods are insufficient to control dust, and/or in very high risk areas. Most triggers in this table are intntionally subjective - the key driver is to avoid causing dust problems. Additional criteria in table 6 for further controls.
(vii) Continuous Monitoring of Total Suspended Particulate (TSP) concentrations and meteorology	Adequately covered but, as mentioned previously (item (i)) the KCDC should be invited to participate in deciding on specific monitoring locations.	s4.5	Refer comment above
(viii) Monitoring of the times of offensive odour emissions from the ground	Adequately covered	s4.3	

(ix) Procedures for responding to discharges of odour (including in the event of excavation of contaminated sites)	Adequately covered	s3.2.2 and s3.3.2	
(x) Monitoring of construction vehicle maintenance	Adequately covered.	s4.4	
(xi) Process equipment inspection, maintenance, monitoring and recording	Adequately covered	s4.9	
(xii) Complaints investigation, monitoring and reporting	Adequately covered	s6	
(xiii) The identification of staff and contractors' responsibilities	The responsibilities of the Environmental Manager and the Alliance Project Manager are laid out adequately in s 1.6, but those of other staff are only covered at a very general level. It appears that the latter responsibilities will be presented in more detail during staff induction and training, but I am unable to judge whether or not that process will be effective.	s1.6	Key responsibilities for site staff are to comply with environmental controls and to observe & report discharges. These are identified in s1.6

Appendix C

KCDC Review Comments

KCDC REVIEW OF CAQMP
Reviewed by: Emily Wilton, Environet Ltd
Date of Review: 18 April 2013
Signature of Reviewer:

I have read the CAQMP for McKays to Peka Peka Expressway, prepared by Camilla Needham prior to independent review by Bruce Graham.
Generally the report read well, identified appropriate sources of dust, factors influencing dust, a monitoring programme and suggested reasonable mitigation measures.
There are a few areas where I think further information is required. I am not sure that the mitigation options proposed are as protective as they could be.

Condition Reference	*Condition Summary*	*KCDC Reviewer's comment*	*Page/paragraph/section reference within Management Plan*	*Management Plan Author's response*	*KCDC Reviewer's additional comment*	*Management Plan Author's further response*
		The report states that the discharge of dust, odour or hazardous air pollutants from the site must comply with key conditions of the Designation (page 3). The issue of odour is not raised elsewhere in the report. Excavation of contaminated soil may result in odour. This should be addressed in the report.	Page 3 - Odour	New sections added addressing odour	Odour has been identified as a potential issue and the report include operating and management procedures and odour monitoring. In my view, the issue has been addressed thoroughly. The only further suggestion is that footnote be added explaining what "odour scout" monitoring involves.	Footnote added to section 4.3 as suggested
		The terminology used for hazardous air pollutants (HAPs) is not scientifically correct. Of those listed only benzene is a HAP. Nitrogen oxides, carbon monoxide and particles are all air contaminants but not HAPs.	Terminology	Accept that this is the definition under the GWRC Regional Plan. However, other Regional Plans - e.g. Auckland Air, Land & Water Plan - include CO, NO2 & PM10. Scientific accuracy of definition not crucial for this management plan.	The terminology with respect to air pollutants is still incorrect. This is a minor issue and of no consequence to the outcomes.	Noted

DC.29	DC 29 states that “Beyond the designation boundary, there shall be no hazardous air pollution caused by discharges from the site that causes, or is likely to cause, adverse effects on human health, environment or property".	More information needs to be provided on the issue of contaminated dust and the potential for adverse health impacts. A layperson may not know whether they should be concerned about inhalation or ingestion and what the proposed monitoring is for. I found the report lacked clarity on what the likely issues were for excavation of contaminated sites and was also unclear about what the purpose of the HAP analysis at GNS was.	General Comment	Primary audience for management plan is Project staff & contractors. Detail re HAPs from contaminated sites to be added as level of contamination is defined - investigation has only just been completed. HAP analysis by GNS is not crucial, but aimed at verifying scale of risk from project. There is also a Contaminated Soils Management Plan (Human Health) that will deal with contaminated land that triggers the NES. The CAQMP needs to be read in conjunction with the other suite of mgmt plans which cover other issues associated with the project.	The issue of contaminated sites has been largely addressed and the report is clearer and more helpful to laypeople in general. It would still be useful to communicate the exposure mechanisms they are concerned about with respect to contaminated dust. In my view ingestion(via contact with deposited dusts) is a more probable exposure mechanism than inhalation, owing to the particle sizes.	Additional information regarding exposure routes and additional mitigation measures added to section 3.2, including prior notification and advice to immediate neighbours before works commence on contaminated sites.
		Tables 2-4 only relate to dust. Other issues to be considered are HAPs, air contaminants and odour.	Tables 2-4	Tables 2-4 at present only include activities in first 6-12 months of construction. Sites affected by potential odour & contaminated site issues not disturbed until later in Project. HAPS from vehicle emissions identified as generic across all stages.		
		The mitigation measures relating to water are about ensuring water is available. Has consideration been given to requiring a water tank be available to quickly distribute this water to required areas. This should be considered.	Mitigation Measures - water	Multiple sources of water have been identified	Mechanisms for distributing water are more thoroughly detailed in the report. In addition a section dedicated to ensuring watering systems are maintained and functioning has been included. This improves the probability that equipment will be available as required for dampening.	Noted

		The mitigation measures talk about orientation of stock piles, shelter belts and dampening stockpiles. Consideration should be given to avoiding or minimising stock piling where possible. Consideration should be given to covering stockpiles where they can't be avoided.	Mitigation Measures - stock piling	Additional mitigation measures included	No changes were made with respect to mitigation measures for stock piling. The recommendation was that stock piling should be minimised and where possible covers should be used. Covers are included as an option for stockpiles of fine material. While it is our view that minimising stock piling is a worthy mitigation measure, other measures are able to be enacted should stock piles generate dust.	Have reviewed previous response and agree that there has been no change to mitigation measures for stockpiles. However, from a wider Project perspective, excavated material is more likely to be used for preloading than merely stockpiled. Conversely, temporary stockpiles are likely to be used in preference to requiring additional truck movements to remove material from the site if it will be required for fill later.