Erosion and Sediment Control Management Plan

Pound Road Industrial Subdivision

Pound Road/Barters Road • Islington

NTP Development Holdings Limited

June 2025

E20739

Revision 1

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

Shaping the future since 1880

Contents

Compiled by:	Todd Inness	09/07/2025	[redacted]
Checked by:	Andy Hall	09/07/2025	[redacted]

Disclaimer

This sediment Control Plan provides the key design outline for the sediment and erosion control measures to be provided on site. It is not possible at initial design stage to anticipate and include all site-specific design details, as some detail can only be included on the basis of in situ monitoring and adjustments. In order to be effective on site the plan will need to be implemented by a contractor experienced in sediment and erosion control, who will be required to monitor its performance and make specific adjustments to its detail to respond to specific conditions on site and changes to those conditions. It is not suitable for unmonitored or unmanaged implementation or implementation by personnel who lack appropriate expertise and experience in erosion and sediment control. We require that the sediment control plan be monitored by an on-site manager or contractor appropriately experienced in sediment and erosion control, who is to make such adjustments as are necessary to ensure its effective operation in view of the features, the condition or state of the site or changes to conditions on site.

EROSION AND SEDIMENT CONTROL MANAGEMENT PLAN FOR THE PROPOSED POUND ROAD INDUSTRIAL SUBDIVISION

1.0 Introduction

In accordance with Canterbury Regional Council erosion and sediment control requirements, this report describes the methods by which potentially sediment laden stormwater runoff and dust is to be controlled during the construction of the Pound Road Industrial Subdivision, corner of Pound/Waterloo and Barters Road, Islington.

The site is located on the southwest fringes of Christchurch, near Templeton bounded by Pound Road to the east, Waterloo Road and Council stormwater basins to the south, Baters Road to the southwest, Hasketts Road to the northwest and Templeton Golf Course to the north. The site is currently comprised of several agricultural/horticultural blocks, lifestyle blocks and a Kainga Ora housing complex. The site is dominated by relatively flat grass and crop paddocks, several large shelterbelts, various houses and ancillary farm type infrastructure. A section of the Paparua Water Race follows Barters Road along the western boundary of the site.

The addresses are 173 and 111 Pound Road, 570 and 578 Waterloo Road, 2, 38, 64, 86 and 94 Barters Road and 4, 22, 30, 40 and 48 Hasketts Road. The corresponding legal descriptions are Lot 3 and 2 DP 33334, Lot 1 DP 33334, Lot 2 DP 20738, Lot 1 DP 20738, Lot 10 DP23834, Lot 2 DP 38418, Lot 1 DP 38418, Lot 7 DP 23834, Lot 6 DP 23834, Lot 2 DP 24156, Lot 1 DP 24156, Lots 2 and 1 DP 23834. The total area of the subdivision is approximately 60 ha. It is proposed to subdivide the land into approximately 73 Industrial lots, utility reserves and associated roads. A site locality map can be seen in Appendix A “Erosion and Sediment Control Management Plan”.

The topography of the site is relatively flat with a gently sloping ground level. The highest part of the site is in the northern corner at a height of approximately RL42.0 (Lot 1 DP 23834). The site falls to the south at a grade of approximately 1 in 260. The corresponding low point in the southern corner of the site is at a height of approximately RL37.0 (Lot 1 DP 33334). There are two anomalies to the general landform, being historic drainage/riverbed channels which are common in this area of the Canterbury Plains. One of these channels starts near the Barters/Madisons/Hasketts Road intersection and extends northeast across the site before continuing through into the golf course land to the north of the site. This channel ranges from approximately 0.6 – 1.8m deep, however is very wide at approximately 40m resulting in bank slopes of 1 in 10 at the steepest point. The second channel begins at the eastern boundary of Lot 2 DP 33334 near the centre of the overall site and grades southeast towards the existing Council and NZTA stormwater basins located at the Pound Road/Waterloo Road intersection. The channel is approximately 1m deep at its extreme and 30m wide, with a corresponding bank grade of

approximately 1 in 12 at the steepest point. These two channels are not connected to any known source of water and would only be expected to hold or convey water in low AEP storm events. As such, it is proposed to fill these channels as part of the subdivision works with no adverse effects on surrounding properties.

Groundwater was not found during the geotechnical investigations on the site. The Geotechnical Report summarises the groundwater level ranging from 13 – 17m below ground level, with the long term avergage mostly between 15 – 16m below ground level. This information is based on historic bore logs and nearby Environment Canterbury monitoring well. These levels are consistent with levels encountered on other development sites within the near vicinity. The groundwater level combined with the composition of underlying soils on the site, confirm no dewatering will be required and disposal of construction phase stormwater to ground is viable.

Various Preliminary and Detailed site investigations into contamination have been undertaken over the subject site. The primary source of contaminants is arsenic, present across various burn pits, many of which exceed the commercial/industrial SGVs. Other sources include an ACM fence at 64 Barters Road, an ACM fragment found in a bund on the 94 Barters Road property and TPH at 173 Pound Road. All contamination that exceeds the commercial/industrial SGVs or is significantly elevated above background levels and may result in contamination being spread or topsoil being unable to be disposed of to clean fill will be removed from site. All contaminated material removed from site will be disposed of at an appropriate contaminated waste facility in accordance with the Remediation Action Plan that has been formed. 40 Hasketts Road and 111 Pound Road are recommended to have a site inspection and any subsequent DSI testing undertaken prior to any works on those sites.

Overall, it is proposed to remediate the site in accordance with the recommendations of the DSI and the RAP provided. Remediation will be undertaken prior to bulk earthworks occurring within the vicinity of the known contamination. Further investigation into the 94 Barters Road bund, 40 Hasketts Road overall site and 111 Pound Road site will occur prior to any bulk earthworks within these areas.

The existing turf and topsoil (approximately 300 - 400mm depth across the site) is to be stripped ahead of cut / fill operations on the lots. All topsoil will then be re-spread on lots or within landscaping areas on the site. A cut/fill balance is provisionally expected to be able to be maintained over the site. A total earthwork cut to fill volume of approximately 170,000m^3 has been calculated from the concept design.

Post-development stormwater generated from the site is to be disposed of via soakage to ground. Runoff from the individual lot building roofs is to be disposed of within the lot via soak pits. The

remainder of the lot areas will discharge to the stormwater network within the road. Flows from the road reserve will enter the pipe network via kerb & channel sumps. The piped network will discharge to stormwater treatment infiltration and detention basins located within the development site. Volumes in excess of the first flush will overtop to soakpits. The public stormwater network and basins is proposed to be vested to Christchurch City Council and will be constructed in accordance with their Global Stormwater Discharge Consent.

2.0 Land Disturbing Activities

During construction the proposed development will involve the following land disturbing activities:

- Construction of Earth bunding and cut-off drains
- Construction of temporary soakpits
- Stripping and stockpiling topsoil
- Filling of redundant section of water race
- Water race culvert installation
- Cut/fill of engineered fill material
- Stormwater basin construction
- Stripping road corridor
- Trenching for the installation of buried drainage pipelines and structures, power and telecommunications
- Respreading of topsoil and sowing of grass

The timing of construction of the development is due to begin in 2026.

3.0 Erosion and Sediment Control Measures

Erosion is to be controlled by sequencing operations to minimise the areas of bare earth exposed for the shortest possible time. Once areas are cut/filled and shaped to their final levels they are to be sown in grass, hydroseeded, paved or landscaped and mulched. Areas will be stabilised as soon as practical to minimise erosion potential. Ground slopes on site are generally flat so sheet runoff will require management; techniques used will include bunds and / or cut off drains.

The site will be surrounded by an earth bund and cut-off drain to ensure the site is contained and no runoff exists the construction area. The cut-off drain will assist in collecting and conveying flows to the temporary soak pits where any sediment laden stormwater will be disposed of to ground. Temporary soak pits have been located at natural low areas and/or areas where flows are expected to accumulate as construction progresses (i.e. at the low point of a proposed road cut). The bulk earthworks will involve firstly excavating the road corridors and secondly filling lots to

grade towards the road corridor. As works progress the stripped road corridor will become the low point of the site acting as a flow path towards the temporary soak pits. It is expected that as the lots are filled the perimeter bunds and cut-off drains will be progressively disestablished, as the new landform will direct flows away from the boundary. Perimeter temporary soak pits can also be disestablished and additional soak pits excavated in the new low areas of the site as works progress. This will need to be continually monitored with progressive removal and commissioning of new ESC measures.

Care needs to be undertaken surrounding existing properties not included in the development site, the Paparua Water Race and the existing Council and NZTA stormwater basins at the southern end of the site. It is proposed to install a silt fence between the earth bund and the Paparua Water Race as initially the earth bund will be unstabilised. Once the earth bund is stabilised or lots that back onto the water race have been filled, graded away from the water race and stabilised the silt fence can be disestablished.

The proposed stormwater basins for the development are not to be used for storing or soaking construction phase stormwater. Any sediment laden stormwater can affect the future performance of the infiltration media and underlying natural sands and gravels.

It is expected that a maximum area of 5ha of the site will be open at any one time. Several temporary soak pits will be utilised within the current open area. The soak pits will be sized for their relevant catchments based on the 1 in 10-year event. These catchments will be formed based on the contractors proposed construction methodology and will therefore be calculated at the time of construction. A sizing example is as follows;
Q = 2.78 x C x I x A

Tc = 20mins, therefore I = 42.2mm/hr

Q = 2.78 x 0.4 x 42.2mm/hr x 5ha

Q = 235l/s = 282cu.m

Assumed soakage rate capped at 1000mm/hr. Over 20mins = 333mm of soakage.

At 125sq.m @ 2m deep there is 250m^3 of storage, therefore 32m^3 will require soaking to ground.

Area of soakpit = 32 / 0.33 = 96 m2, therefore at 125m2 there is sufficient soakage and storage to cater for the 10% critical event. In reality, this will be made up of several smaller soakpits to better manage runoff within the unstabilised areas of the site.

Several stabilised site access points will be utilised by the development. Stage 1 would be expected to access off the future road connection points to Barters Road. Initially the southern Barters Road connection wouldn't be utilised until such time as the culvert within the water race is installed to facilitate a second access at the future Road 3 connection point. Stage 2 will be accessed from Pound Road via the new road connection point. Stage 3 will be access off the end of completed development stages, the exact location of the stabilised entrance(s) will be determined at the time of construction and chosen to cause the least disruption to users of the completed development. Stage 4 will be accessed from Hasketts Road, a secondary access could be formed from the completed Stage 2. Stabilised entrances are to be constructed to ensure no tracking of sediment from the construction site occurs. The entrances may consist of ballast rock aprons and shaker ramps, with any site access points monitored regularly to determine if the aprons need extending or additional shaker ramps are required.

Further details of the erosion and sediment control measures described above are shown on Appendix A "Erosion and Sediment Control Plan". Works are to be constructed in accordance with Environment Canterbury's Erosion and Sediment Control Guidelines.

4.0 Dust Control Measures

Please refer to the Dust Management Plan included as Appendix B

As dust is generated by high winds, and the discharge will be in the direction of the prevailing wind at the time, it is not practicable to sketch the location of the discharge. It is recognised that the development site is adjacent to existing industrial development and rural residential houses. Also

The source of the water for the dust suppression will likely be provided by council supply subject to CCC approval. Alternatively, the existing bores on site may be utilised.

5.0 Construction Sequence

The proposed sequence is as follows:

- Plan the methodology and timing of land disturbing activities to minimise erosion and sediment generation.
- Check existing access is suitable and upgrade to form sufficient stabilised entrance if required.
- Form bunds and cut off drains.
- Construct temporary soakpits.
- Strip and stockpile topsoil from construction area.
- Cut/fill operations on bulk earthworks areas.
- Trenching and installation of buried services.

- Excavate and construct kerb and channel.
- Excavate and backfill pavement in roading areas.
- Cut and fill berms to required levels, respread topsoil and sow in grass.
- Stabilise any stockpiles of surplus soil by surface roughening and sowing in grass
- Seal paved areas.
- Once grass is established on berms remove the sediment control devices and diversion bunds/channel.

6.0 Monitoring

Monitoring shall be undertaken in accordance with CCC & ECan consent conditions. These sediment control measures will be continually reviewed on a daily basis and amendments and additions will be made where necessary.

Sediment control facilities shall be inspected at least once a day and after each rainfall. A weekly on-site record of each inspection will be kept. Any repairs required shall be done immediately. In addition, inspections of the facilities will be undertaken and recorded prior to forecasted rainfall events and regularly throughout rainfall events.

The facilities will also be checked by the engineer and reported on at weekly site meetings.

It will remain the contractor's responsibility to ensure that sediment is not discharged from the site as a result of their activities. Should it become evident that the control measures specified in this document are failing to prevent erosion or sediment discharge then the contractor shall take further action to remedy this. The contractor is to be fully conversant with the ECAN erosion and sediment control guidelines but may contact Davie Lovell-Smith if further advice with erosion and sediment control management planning is required.

Construction is intended to commence in 2026. The development will be undertaken in stages with the construction period is likely to be approximately 8 months per stage. A detailed programme is to be formed and provided by the contractor upon award of tender to allow the planning and sequencing of works to run as smoothly as possible. The erosion and sediment control measures should be included in the programme, with any likely changes forecasted based on upcoming programmed works.

A pre-start meeting will be held prior to any works commencing with all stakeholders to ensure all requirements of the relevant consents and this Erosion and Sediment Control Plan are covered and any changes from the proposed plan discussed and implemented if necessary.

APPENDIX A – EROSION AND SEDIMENT CONTROL PLAN

NORTH

DISCLAIMER

THIS SEDIMENT CONTROL PLAN PROVIDES THE KEY DESIGN OUTLINE FOR THE SEDIMENT AND EROSION CONTROL MEASURES TO BE PROVIDED ON SITE. IT IS NOT POSSIBLE AT INITIAL DESIGN STAGE TO ANTICIPATE AND INCLUDE ALL SITE-SPECIFIC DESIGN DETAILS, AS SOME DETAIL CAN ONLY BE INCLUDED ON THE BASIS OF IN SITU MONITORING AND ADJUSTMENTS. IN ORDER TO BE EFFECTIVE ON SITE THE PLAN WILL NEED TO BE IMPLEMENTED BY A CONTRACTOR EXPERIENCED IN SEDIMENT AND EROSION CONTROL, WHO WILL BE REQUIRED TO MONITOR ITS PERFORMANCE AND MAKE SPECIFIC ADJUSTMENTS TO ITS DETAIL TO RESPOND TO SPECIFIC CONDITIONS ON SITE AND CHANGES TO THOSE CONDITIONS. IT IS NOT SUITABLE FOR UNMONITORED OR UNMANAGED IMPLEMENTATION OR IMPLEMENTATION BY PERSONNEL WHO LACK APPROPRIATE EXPERTISE AND EXPERIENCE IN EROSION AND SEDIMENT CONTROL. WE REQUIRE THAT THE SEDIMENT CONTROL PLAN BE MONITORED BY AN ON-SITE MANAGER OR CONTRACTOR APPROPRIATELY EXPERIENCED IN SEDIMENT AND EROSION CONTROL, WHO IS TO MAKE SUCH ADJUSTMENTS AS ARE NECESSARY TO ENSURE ITS EFFECTIVE OPERATION IN VIEW OF THE FEATURES, THE CONDITION OR STATE OF THE SITE OR CHANGES TO CONDITIONS ON SITE.

AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION
R1	09/07	LEGEND UPDATED

NOTES :

E&SC MITIGATION MEASURES

- The stabilised entranceway must be placed prior to establishment on site and must be maintained and replaced as required to ensure dirt tracking off site is minimal.
- Boundary silt fences to be established prior to the commencement of earthworks and is to maintain in place until the remainder of the site has been topsoiled and seeded.
- Earthworked areas are to be topsoiled and seeded as soon as practically possible following re-contouring of the site.
- The base of the construction soakage pit must extend at least 0.5m into permeable soils.
- Means of controlling dust nuisance must be available on site for the entirety of the earthworking procedure. site works must halt if the production of dust cannot be controlled.
- Temporary soakhole to be decommissioned upon completion of earthworking and reinstated in accordance with NZS4431:2011.
- Contour Interval: 0.5m Minor and 2.0m Major
- ESC measures may be progressively installed andremoved as required during the construction period.

Haskells Road

Barters Road

Pound Road

Waterloo Road

Lot 3
DP 408260

STAGE 1

STAGE 2

STAGE 3

STAGE 4

ROAD 1

ROAD 2

ROAD 3

ROAD 4

ROAD 5

ROAD 6

SECTION OF OLD WATER RACE TO BE FILLED

PAPARUA WATER RACE

PAPARUA WATER RACE

PAPARUA WATER RACE

SEE INSET ON ESCMP02

Lot 101 DP 472402

Lot 10 DP 472402

Lot 100 DP 472402

Lot 1 DP 472402

Lot 99 DP 472402

Lot 2 DP 472402

LEGEND :

- OVERLAND FLOW
- EARTH BUND
- CUT OFF DRAIN
- SILT FENCE
- STAGE BOUNDARY
- BALAST STABILISED ENTRANCE
- TEMPORARY SOAKPIT

EXISTING SERVICES — PROPOSED SERVICES

KERB — KERB — CUT DOWN

	NAME	SIGNED	DATE
DESIGNED BY	TODD INNESS		
CHECKED BY			

DAVIE LOVELL-SMITH
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JOB TITLE:
Pound Road Industrial Subdivision

SHEET TITLE:
Erosion & Sediment Control Plan

DRAWING STATUS
For Discussion Purposes

SCALE : 1:2000@A1 1:4000@A3 DATE : July 2025

CAD FILE : J:\20739\Eng\Drawings\20739_ESCMP_R1.dwg DRAWN : JS

DRAWING No : **E20739** SHEET No: ESCMP01 REVISION : **R1**

APPENDIX B – DUST MANAGEMENT PLAN

Dust Management Plan

Pound Road Industrial Subdivision

Pound Road/Barters Road • Islington

NTP Development Holdings Limited

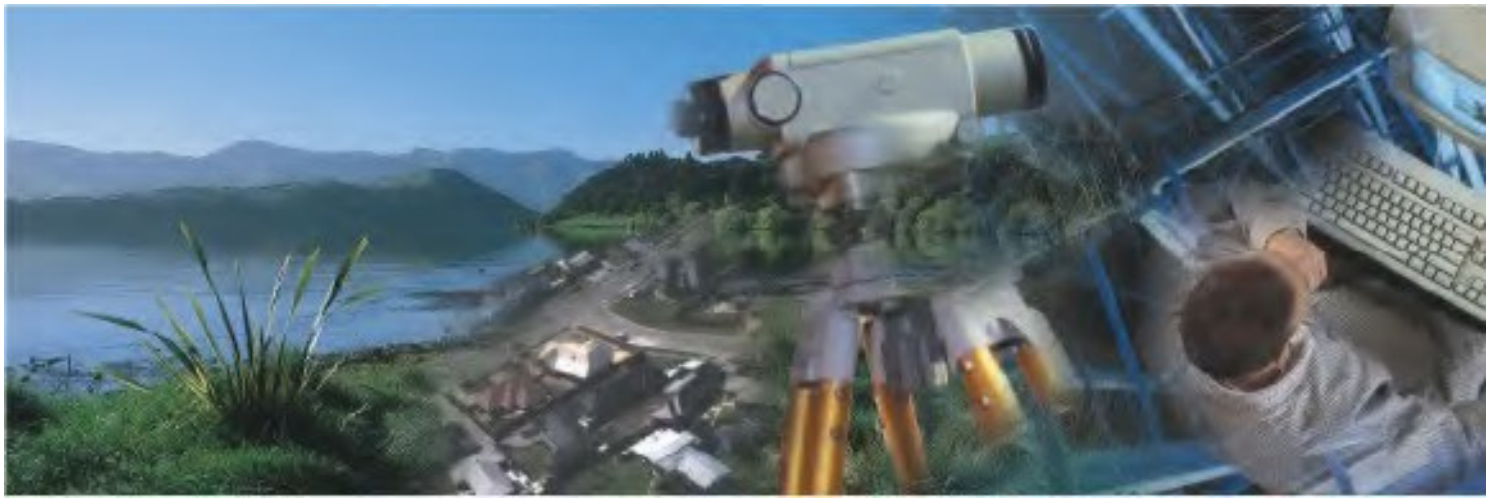
June 2025

E20739

Revision 0

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING



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Contents

Compiled by:	Todd Inness	[redacted]	14/05/2025
Checked by:	Ben Fox	[redacted]	18/06/2025

Disclaimer

This Dust Management Plan provides the key design outline for the dust control measures to be provided on site. It is not possible at initial design stage to anticipate and include all site-specific design details, as some detail can only be included on the basis of in situ monitoring and adjustments. In order to be effective on site the plan will need to be implemented by a contractor experienced in dust control, who will be required to monitor its performance and make specific adjustments to its detail to respond to specific conditions on site and changes to those conditions. It is not suitable for unmonitored or unmanaged implementation or implementation by personnel who lack appropriate expertise and experience in dust control. We require that the dust control plan be monitored by an on-site manager or contractor appropriately experienced in dust control, who is to make such adjustments as are necessary to ensure its effective operation in view of the features, the condition or state of the site or changes to conditions on site.

1.0 Introduction

In accordance with Canterbury Air Regional Plan (CARP), this report describes the methods by which potential nuisance dust is to be controlled during the construction of the Pound Road Industrial Subdivision.

The site is located on the southwest fringes of Christchurch, near Templeton bounded by Pound Road to the east, Waterloo Road and Council stormwater basins to the south, Baters Road to the southwest, Hasketts Road to the northwest and Templeton Golf Course to the north. The addresses are 173 and 111 Pound Road, 570 and 578 Waterloo Road, 2, 38, 64, 86 and 94 Barters Road and 4, 22, 30, 40 and 48 Hasketts Road. The corresponding legal descriptions are Lot 3 and 2 DP 33334, Lot 1 DP 33334, Lot 2 DP 20738, Lot 1 DP 20738, Lot 10 DP23834, Lot 2 DP 38418, Lot 1 DP 38418, Lot 7 DP 23834, Lot 6 DP 23834, Lot 2 DP 24156, Lot 1 DP 24156, Lots 2 and 1 DP 23834.

The total area of the subdivision is approximately 60 ha. It is proposed to subdivide the land into approximately 73 Industrial lots, utility reserves and associated roads.

The surrounding sites are a mixture of rural residential and industrial. Given the proximity of some neighbouring sites there is a potential for fugitive dust to detrimentally affect the amenity of adjacent properties, especially in the drier months of the year which is when earthworks are expected to be undertaken.

Under the provisions of Environment Canterbury's CARP, the Site Operator must ensure that any emissions of dust from the activities carried out on the site do not result in a nuisance to the company's residential and commercial neighbours. The Site Operator must also be able to provide an assurance to the community that any discharges of dust do not cause an objectionable or offensive effect beyond the property boundary.

This plan details the measures and procedures that will be implemented to avoid, mitigate or remedy any adverse effects which might be caused by the discharge of airborne particulates from the activities carried out by contractors and subcontractors during the construction of the development site.

A copy of this management plan is to be kept on site and always made available for Site Operator's management and staff.

The following Dust Management Plan (DMP) has been prepared in accordance with the requirements of the CARP. The relevant sections of the CARP are referenced in Appendix C. The purpose of this document is to provide a framework for site operators and visiting contractors to minimise potential nuisance dust emissions from the site activities. These activities must be undertaken in a manner that will minimise the risk of nuisance dust effects beyond the boundary of the site during the hours of operation. Site personnel and contractors will be required to conform to the requirements of this DMP. Specific controls are proposed to limit after hours emissions, these controls are to be applied at the end of the day and prior to any extended break in works (i.e. holiday periods).

The goal is that by following the procedures outlined in this plan, the site-based activities will not result in the production of offensive or objectionable nuisance dust effects beyond the boundary of the site.

It is intended that this document will be a 'living' document, which will be regularly referred to by site

staff and management. It will also be updated to meet changing conditions on the site.

2.0 Description of Potential Emissions

The construction methods used in the construction of the proposed development may result in nuisance dust being carried from the site in high wind conditions.

The dust discharged from the proposed construction will be biologically inert and will be predominately nuisance dust with small amounts of particulate smaller than 10 µm (PM_{10}). It will tend to have a yellow brown colour dependent on the source of the dust.

Nuisance dust refers to dust of larger particle sizes (generally greater than 30 µm in diameter) otherwise known as Total Suspended Particulate (TSP). Generally, TSP does not travel further than 250 m from the discharge source in high wind conditions (considered to be greater than 10 m/s). Individual particles become visible at approximately 50 µm and particulate discharges in this size range (greater than 50 µm) are generally associated with nuisance effects rather than health effects. Nuisance dust effects often relate to dust clouds obscuring visibility and soiling of clean surfaces such as cars, washing, outdoor furniture, etc. At times nuisance effects can extend to the contamination of rainwater collection systems and increased dust deposition inside houses (particularly when windows are left open in summer). These effects lead to additional cleaning requirements, reduced ability to enjoy outdoor living areas, and overall reduced amenity values.

PM_{10} has the ability to enter the alveoli in the lungs and cause respiratory health effects. However, it is expected that provided the dust control measures described within this report are followed that the PM_{10} levels will be well below the relevant regulatory criteria (National Environmental Standards for Air Quality).

The dust discharged from this site is not considered to be particularly offensive in low quantities due to its natural origin, however, when visible clouds or deposited dust are observed off-site this can lead to complaints from neighbours.

3.0 Description of the Operation

During construction the proposed development will involve the following land disturbing activities:

- Construction of Earth bunding and cut-off drains
- Construction of temporary soakpits
- Stripping and stockpiling topsoil
- Filling of redundant section of water race
- Water race culvert installation
- Earthworking and filling of lots
- Excavation of roading
- General cut/fill
- Stormwater basin construction
- Trenching for the installation of buried drainage pipelines and structures, power and telecommunications
- Respreading of topsoil and sowing of grass

The construction works are scheduled to begin in 2026.

Earthwork material is to be transported within the development site by motor scrapers or trucks loaded by an excavator or loader. The soil is to be deposited by the trucks and then shaped and compacted.

Potential dust emissions can occur from the site primarily during operational hours due to specific site activities (listed in Section 5), however there is potential for after hour emissions from exposed surfaces. In general, dust emissions do not occur constantly and are activity specific. The Site Operator will identify critical discharge points and appropriate mitigation measures to reduce the frequency, intensity and duration of any discharges. These are outlined in this DMP.

4.0 Environmental Setting

This section provides site staff with the land uses beyond the boundary of the development, such that they can be aware of the potential for their actions to effect off-site receptors. Also discussed are the predominant weather conditions such that staff can be aware of how wind patterns across the site may influence the potential for off-site effects.

The site is located on the southwestern fringe on Christchurch, near Templeton. There is an absence of dense residential housing surrounding the development which will assist the mitigation of nuisance dust, however, there is still several rural residential properties on the opposite side of Barters Road adjacent to the development. These houses to the southwest of the development and Waterloo Business Park to the east of the development need to be carefully considered during any activity that has the potential to cause dust. Pound Road and State-Highway 1 are both also within proximity and carry large volumes of traffic during typical construction hours.

Winds from the west and north have the potential to disperse dust towards Pound Road, State-Highway 1 and Waterloo Business Park. Winds from the northeast through to the southeast have the potential to disperse dust towards the existing rural residential properties. During the summer when the greatest chance for nuisance dust is present, prevailing wind directions are within the zones described above.

5.0 Potential Sources of Nuisance Dust

There are a number of sources and activities that occur on site which have the potential to generate dust. These include:

- Overburden/topsoil stripping and bund construction;
- Soil excavation works;
- Loading and unloading trucks;
- Vehicle movements (predominantly on haul routes);
- Dust from the replacement of topsoil, formation of final level and rehabilitation works;
- Dust from exposed unconsolidated surfaces; and

The major factors that influence dust emissions from surfaces are:

- Wind speeds across the site; the critical wind speed for pickup of dust from surfaces is 7m/s.
- The percentage of fine particles in the material.
- Moisture content of the material.
- The area of exposed surfaces.
- Disturbances such as vehicle movements, materials handling activities, etc.

- The height of the dust source above the surrounding ground level.

6.0 Dust Mitigation and Site Procedures

Presented in this section are details on the activities that have the potential to generate dust, and mitigation techniques to minimise the potential for effects to occur. Mitigation measures are intended to be practicable such that effective controls can be easily worked into the day-to-day operation of the site. Particular care needs to be taken during hot dry days with strong wind conditions (greater than 7 m/s). These conditions lead to an elevated potential for nuisance dust emissions.

There are a number of site wide and activity specific mitigation measures outlined below which will need to beimplemented by all site staff and contractors. These measures will be effective in reducing the potential for dust emission from the above sources to very low levels. As a backup measure, visual monitoring by key site staff is proposed to ensure the effectiveness of the proposed mitigation. Primarily, mitigation measures are triggered by visual monitoring, however some are triggered by meteorological conditions as observed on the MetService website.

A responsibility chart is included in Section 8, outlining specific responsibilities for key site staff.

Activity specific mitigation is staged to ensure that an appropriate level of mitigation is applied to the activity and backup measures are available. At a minimum Level 1 mitigation is to be applied, should Level 1 mitigation not be effective at containing visible dust emissions, then Level 2 mitigation is to be implemented, finally if Level 2 is still not effective, Level 3 is to be applied. Note that Level 3 mitigation often involves a high level of capital cost or stop work conditions thus wherever possible site staff are to be vigilant at ensuring Level 1 and Level 2 controls are applied effectively and efficiently.
Visual monitoring is applied at the source, the aim is to ensure that no, or minimal, visible dust emissions occur from any activity on-site. This provides a level of redundancy/buffer, as dust emissions will dissipate between the emission source and the site boundary/nearest off-site receptors.

Effective controls at the source are the key to maintaining a compliant operation.

6.1 Site Wide Activities

Site staff are to undertake dust mitigation methods from site wide activities as required to minimise the overall dust emissions from the site.

Mitigation Measures to be Applied

Level 1

The site is monitored during the operational hours and steps are taken to ensure that dust nuisance does not occur, such as:

- Operating the watercart to reduce/eliminate dust emissions from high traffic areas.

- Ensuring site vehicles are traveling at speeds less than 20 km/hr and per 'Vehicle Movements' procedures (see section below).
- Undertake the daily visual dust monitoring programme (Appendix B).
- Regular monitoring of the MetService website's weather data. Undertake associated mitigation measures when Level 1 or Level 2 wind triggers are exceeded.
- Good housekeeping, which includes; regular maintenance of site roads, cleaning the site access road, watering down exposed surfaces, and regular maintenance of critical site equipment (i.e. the water truck).
- The site operator will maintain the existing and proposed perimeter bunds to reduce surface wind speedacross the site and form a partial barrier to any residual dust emitted from the site.
- Site staff are to be aware of the forecast weather conditions and discuss these at staff meetings. Where possible, dust generating activities near the downwind boundary are to be minimised or have elevated levels of mitigation applied, to minimise visible dust emissions crossing the boundary.
- Dust control procedures and responsibilities are to be included in site induction training for all new staff/regular contractors on-site.
- Records are to be kept of site activities, dust control measures implemented, daily visual inspections, any checklists that include dust mitigation measures implemented by site staff. These records can be used to investigate and/or defend off-site complaints.

Level 2

- In the event that visible dust is observed traveling beyond the boundary of the site by site staff or contractors, the activity generating the emissions is to cease immediately. It is the responsibility ofevery employee and contractor on the site to immediately notify the site manager so that dust mitigation measures can be implemented prior to the offending activity recommencing.
- Application of dust suppressant polymer to exposed surfaces.

Level 3

- Install boundary real time dust monitoring with real time dust concentration triggers to alert site management to increase mitigation measures, or instigate stop work conditions.
- A number of mitigation measures below are triggered by wind speed trigger levels, the definition of windtrigger Level 1 and Level 2 is defined below for your reference:

Wind trigger Level 1: wind speed over 7 m/s, no rain within 24 hours.

Wind trigger Level 2: wind speed over 10 m/s, no rain within 24 hours.

6.2 Vehicle Movements

Poorly maintained internal roads can have a high dust generation potential. The factors affecting dust generation from vehicle movements are the particle size distribution on the surface of the road, the moisture content of the road base and the speed of the vehicle.

The distance of the vehicle movement from the site boundary will have a direct bearing on the potential for nuisance dust to leave the site, due to dust settling and dispersion.

Most vehicle movements will be confined to designated and maintained site roads. The main heavy vehicle route to and from the site is of primary concern.

Regular maintenance and watering of the internal roads is required and key to reducing potential emissions from vehicle movements.

Site staff are to undertake dust mitigation methods as required to minimise the overall dust emissions from thesite.

Mitigation Measures to be Applied

Level 1

- There will be a strict speed limit of 20 km/hr for all vehicles on-site and on the main haul road. The watercart will be operated on all haul roads as a minimum during Level 1 wind conditions.
- It is important that vehicle operators monitor and report any dust emissions occurring from internal roads. Where visible dust is observed the site manager is to be notified such that additional controls can be implemented immediately.
- Internal roads are to be maintained regularly by applying coarse material to the surface or an alternate non-dusty surface material (i.e. asphalt millings and sealing chip). This activity is to be assigned to adesignated staff member by the site manager.
- Where the surface material is dry, it is to be wet down by the water cart such that the material is damp prior to disturbance.

Level 2

- If dust plumes become visible as a result of vehicles travelling around the site, water will be immediately applied to the road surfaces.
- Vehicles are to travel slower than 20 km/hr to limit dust emissions from the road surface.

Level 3

If Level 2 mitigation is still not sufficient to control dust emissions from this source, the following mitigation measures are to be investigated/implemented.

- Suspend traffic movements until emissions cease.
- Resurface haul routes such that surface fines are reduced.
- Investigate sealing the internal haul roads.

6.3 Product excavation works

Excavation is to be staged to minimise the amount of unconsolidated surface at any one time and reduce the working area and excavation face.

Generally, the material is damp when it is excavated and therefore has a lower dust generation potential.

Site staff are to undertake product excavation mitigation as follows:

Mitigation Measures to be Applied

Level 1

- Site staff are to minimise the drop heights for all excavator/loader bucket loads; and
- Limit the working area to 4 hectares.

Level 2

- Use watercart to wet down working area and product as required during Level 1 wind conditions.

Level 3

- Should effective dust control still not be achieved by the above control measures, suspend product excavation works during Level 2 wind conditions.

6.4 Loading and unloading trucks

The type of material being loaded/unloaded will have a direct bearing on its ability to generate nuisance dust emissions i.e. the particle size distribution and moisture content. For example, dry friable topsoil or silts will have a much higher dust emission potential than damp aggregates (the raw product being extracted).

Trucks or loaders are used to convey material around the site and raw product to and from the site. This process has the potential to create dust emissions. It is important for plant operators to be aware of the level of risk associated with the type of material they are loading or unloading (i.e. its moisture content and the proportion of fines in the product).

Site staff are to undertake loading and unloading mitigation as follows:

Mitigation Measures to be Applied

Level 1

- Limiting drop heights for loaders/excavators loading trucks.
- Where possible loading and unloading of trucks is to occur in the pit where wind speeds are reduced (relative to those at ground level).

Level 2

- Wetting down loads with a higher proportion of fines, as necessary.
- Restrict fine material loading and unloading during Level 1 wind conditions.

Level 3

- Stop all loading/unloading activities during Level 2 wind conditions.

6.5 Dust from exposed and unconsolidated surfaces

Fine unconsolidated particulates on the surface of the ground can become airborne during high wind conditions.

An 8,000 litre water cart (or similar) is to always be available on-site. This water cart is to have the ability to apply water at a rate of one litre per square metre to approximately 15,000 square metres per hour. Additional water carts are to be available if larger areas of the site are exposed. The watercart operator is to be aware of the location of nearby water sources and the procedure for operating the watercart during dry windy conditions to ensure the water application rate matches the site requirements.

Site staff are to undertake staged mitigation as follows to reduce the potential for fugitive discharges

from unconsolidated surfaces:

Mitigation Measures to be Applied

Level 1

- Traffic access to exposed areas is to be limited to the practical minimum, isolation bunds are to be used where applicable to prevent vehicle access to exposed areas. Exposed areas with no or low traffic access will be watered to form a crust over the surface and limit the amount of fines on the surface.
- The watercart operator is to prioritise watering and dust suppression measures to areas with high traffic movements.

Level 2

- Operate the watercart during Level 1 wind conditions.
- To limit after hour emissions from exposed surfaces, where necessary the watercart is to be operated at the end of day to form a crust on any exposed unconsolidated surfaces, this will limit after hour emissions from these sources.
- Progressive rehabilitation and re-grassing of mined and backfilled areas of the site are to occur as soon as practically possible to limit the amount of exposed surfaces.
- Application of dust suppressant polymer to exposed surfaces.

Level 3

- Where the above is not sufficient to control dust emissions from unconsolidated surfaces, use hydroseed to cap the emitting exposed surfaces.
- Further restrict the amount of open ground.

7.0 Complaints

Complaints may be received by site staff or by one or more of the regulatory authorities. It is the responsibility of the Site Manager to respond to and follow up all complaints relating to dust. The Site Manager is responsible for ensuring suitably qualified personnel are available to respond to complaints at all times.

7.1 Actions to be taken as soon as possible by the Site Manager

If any complaint is received by The Site Operator regarding dust, Environment Canterbury will be notified of the complaint as soon as practicable and no longer than 24 hours after the complaint was received.

The initial action to be undertaken by The Site Operator following a complaint is to investigate the likely source and if possible, implement immediate corrective action to prevent this from continuing or occurring again.

Formal procedures are required when a complaint regarding objectionable dust is received by the Site Operator. A complaint log shall be filled out by the Site Manager to record the following details:

(i). Time of complaint;
(ii). Name and address of complainant (if available);

(iii). Location from which the complaint arose;
(vi). Wind direction and speed at the time of the complaint;
(vii). The likely cause of the complaint;
(viii). The response made by The Site Operator; and
(ix). Action taken or proposed as a result of the complaint.

7.2 Follow Up Actions

- Advise Environment Canterbury and site management as soon as practical that a complaint has beenreceived, what the findings of the investigation were, and any remedial actions taken.
- Advise site staff and contactors that a complaint has been received, what the findings of the investigation were, and the remedial actions to be taken. Change standard operating procedures to prevent reoccurrence of complaints.

8.0 Responsibilities

The Site Operator manages the site and has the ultimate responsibility of ensuring that all site activities are carried out consistently with this DMP and in a way that does not result in off-site effects.

The Site Manager will have overall responsibility for the following:

- Overall responsibility at the site for ensuring that the dust control and mitigation measures and procedures outlined in this DMP are implemented effectively.
- Responsibility to ensure that complaints are received and investigated as outlined in Section 7 of this DMP.
- Responsibility for ensuring all staff and sub-contractors on site are adequately trained regarding the dust control methods used on site and are aware of the requirements of the DMP.
- Overall responsibility to ensure that dust emissions are avoided and investigated as far as is practicable.
- Responsibility to ensure the DMP is current and revised where site activities change.
- Instigating a site stop work condition where excessive dust emissions are travelling beyond the boundary.

All contractors and staff working on site are to ensure that their activities comply with the requirements of the DMP.

The Site Manager may delegate responsibility for some tasks as shown in Table 3.

Table 3 Responsibility Chart (to be completed by The Site Operator)

Task	Person Responsible	Alternative	Contact Number
Site Manager			

Internal road maintenance			
Equipment Maintenance			
Complaints Investigation			
Water Cart Operation			
Dust Management Trainingand Induction			
Visual Monitoring and DustAlerts			

9.0 Training

The Site Operator will ensure that appropriate site staff are trained in dust management techniques. This includes the following monitoring and mitigation techniques:

- How to recognise Level 1 or Level 2 weather conditions that could generate dust emissions. This may be via an app on mobile phones or automatic emails/text messages.
- What site operations have greater potential to generate dust.
- How to operate the dust control systems.
- Site restrictions, e.g. vehicle speeds, placement of fine materials, loading and unloading of fine materials, Level 1 and Level 2 wind triggers.

Designated staff should also be aware of and able to carry out the daily visual dust monitoring programme (Appendix B).

APPENDIX A – Daily Visual Dust Monitoring Program

Dust Monitoring Plan

The overall approach to dust control is based on visual monitoring in combination with good management of the operations, and a rapid response to any complaints received. Good practice is focused on pre-emptive measures to ensure that off-site dust effects are minimised.

Visual Inspection and Monitoring Methods

General visual monitoring of the site should be undertaken on a daily basis or potentially more frequently, if conditions change. Should visual observations detect off-site dust the control measures described in **Section 6** of the DMP should be implemented. The Table below can be used to demonstrate compliance with the monitoring programme.

Table A-1 Daily Visual Dust Monitoring Programme

Date:		**Employee Name:**	
Monitoring Activity	**Frequency**	**Completed**	**Comments**
Site Wide Activities			
Check weather forecasts for strong winds andrainfall to plan dust management response (e.g. hot, sunny and strong wind speeds).	Daily	☐	Forecast wind direction: Forecast wind speed: Forecast Rainfall:
Inspect land adjacent to the site and at site exits for the presence of dust deposition/tracking.	Daily	☐ ☐	
Regularly monitor MetService website data forexceedances of the Level 1 or Level 2 trigger points.	Daily and as conditions change	☐ ☐ ☐	Have wind limits been triggered? Y ☐ / N ☐ Has it rained in previous 24 hrs? Y ☐ / N ☐
Inspect watering cart to ensure it is maintained and functioning effectively.	Weekly	☐	
Monitor dust generating activities from exposedsurfaces when wind limits are triggered.	In winds over 7 m/s	☐ ☐ ☐	Is dust being picked up from exposed surfaces? Y ☐ / N ☐
Vehicle Activities			
Check if dust is being generated by vehicle movements.	Twice daily	☐ ☐	Has water cart been deployed? Y ☐ / N ☐
Truck Loading/unloading			
Check if dust is being generated by truck loading/unloading activities.	Daily	☐	Are plant operators minimising drop heights? Y ☐ / N ☐
Boundary monitoring			
Undertake a walk around of the site boundary tomonitor if any visible dust is crossing the boundary.	Daily and as conditions change	☐ ☐ ☐	Is any visible dust present? Y ☐ / N ☐ If so what corrective actions have been applied? _____ _____

APPENDIX B – Excerpts from the Canterbury Air Regional Plan (CARP)

The purpose of this Plan

" The Air Plan seeks to manage discharges to air in the best practicable manner. Its principal purpose is to maintain air quality where it provides for people's health and cultural wellbeing, or to improve it if it does not, whilst recognising the investment in, and significant contribution to the economy and social wellbeing of Canterbury of industrial and trade activities that discharge into air."

Types of Contaminants

"At the other end of the spectrum are contaminants that predominantly affect wellbeing rather than physical health. The main ones are smoke and dust discharges. The Air Plan imposes controls upon these discharges by reference to the so-called FIDOL factors: the frequency, intensity, duration, offensiveness and location of the discharge."

Policies

6.4 *Reduce adverse effects of discharges on people where ambient air quality does not meet the value setin a national ambient air quality standard or guideline.*

6.5 *Minimise adverse effects on people where ambient air quality is degraded when assessed against anational ambient air quality standard or guideline.*

6.6 *Maintain ambient air quality in locations where the quality is acceptable when assessed against an ambient air quality standard set in a national ambient air quality standard or guideline.*

6.7 *In Clean Air Zones, reduce overall concentrations of $PM_{2.5}$ so that by 2030 those concentrations do not exceed 25µg/m^3 (24 hour average) and 10µg/m^3 (annual average).*

6.8 *Offensive and objectionable effects are unacceptable and actively managed by plan provisions and theimplementation of management plans.*

6.9 *Discharges into air from new activities are appropriately located and adequately separated from sensitiveactivities, taking into account land use anticipated by a proposed or operative district plan and the sensitivity of the receiving environment.*

Rules applying to all activities

7.3 ***The discharge of odour, dust or smoke into air that is not managed by any other rule in this Plan is a permitted activity provided the following conditions are met:***

1. *The discharge does not cause or is not likely to cause an adverse effect beyond the boundary of the property of origin; and*
2. *The discharge does not cause an offensive or objectionable effect beyond the boundary of the* ***property*** *of origin when assessed in accordance with Schedule 2.*

7.4 ***The discharge of odour, dust or smoke into air that is not managed by any other rule in this Plan and that does not meet condition 1 of Rule 7.3 is a restricted discretionary activity.***

The exercise of discretion is restricted to the following matters:

1. *The content of the management plan to be implemented; and*
2. *The frequency of the effects of the discharge; and*
3. *The intensity of the effects of the discharge; and*
4. *The duration of the effects of the discharge; and*
5. *The offensiveness of the discharge; and*
6. *The location of the effects of the discharge; and*
7. *The matters set out in Rule 7.2; and*
8. *Mitigation methods available to minimise any actual or potential environmental effects on theefficacy of the package of conditions.*

7.5 The discharge of odour, dust or smoke into air that does not meet condition 2 of Rule 7.3 is a non-complying activity.

Rules - Dust generating activities

7.32 The discharge of dust to air beyond the boundary of the property of origin from the construction of buildings, land development activities, unsealed surfaces or unconsolidated land, is a permittedactivity provided the following conditions, where applicable, are met:

1. *The building to be constructed is less than 3 stories in height, or where the building is greater than3 stories in height, a dust management plan is prepared in accordance with Schedule 2 and implemented by the person responsible for the discharge into air; and*
2. *The area of unsealed surface or unconsolidated land is less than 1000m^2, or where the area of unsealed surface or unconsolidated land is greater than 1000m^2 a dust management plan is prepared in accordance with Schedule 2 and implemented by the person responsible for the discharge into air; and*
3. *The discharge does not cause an offensive or objectionable effect beyond the boundary of the property of origin, when assessed in accordance with Schedule 2.*

7.33 The discharge of dust, beyond the boundary of the property of origin, from the construction of buildings, land development activities, unsealed surfaces or unconsolidated land that does not meet condition 1 or 2 of Rule 7.32 is a restricted discretionary activity.

The exercise of discretion is restricted to the following matters:

1. *The content of the management plan to be implemented; and*
2. *The frequency of the effects of the discharge; and*
3. *The intensity of the effects of the discharge; and*
4. *The duration of the effects of the discharge; and*
5. *The offensiveness of the discharge; and*
6. *The location of the effects of the discharge; and*
7. *The matters set out in Rule 7.2; and*
8. *Any effect on the environment of not meeting the condition or conditions of the particular rulecontravened; and*
9. *Whether the conditions of the rule, when considered as a package, remain effective; and*

10. *Mitigation methods available to minimise any actual or potential environmental effects on theefficacy of the package of conditions.*

7.34 The discharge of dust into air beyond the boundary of the property of origin, from the construction of buildings, land development activities, unsealed land or unconsolidated surfaces that does not meet condition 3 of Rule 7.32 is a non-complying activity.

7.35 The discharge of contaminants into air from the handling of bulk solid materials is a permitted activity provided the following conditions are met:

1. *The discharge of dust does not cause an offensive or objectionable effect beyond the boundaryof the property of origin, when assessed in accordance with Schedule 2; and*
2. *The handling occurs indoors, or where the handling occurs outdoors the rate of handling doesnot exceed 100t per hour; or*
3. *Where handling occurs outdoors on less than 21 days per calendar year, the rate of handling doesnot exceed 250t per hour; and*
4. *Where the handling occurs outdoors and the rate of handling exceeds 20t per hour, a dust management plan is prepared in accordance with Schedule 2 and implemented by the personresponsible for the discharge into air; and*
5. *The dust management plan is supplied to the CRC on request; and*
6. *The discharge does not occur within 200m of a sensitive activity, wāhi tapu, wāhi taonga or place of significance to Ngāi Tahu that is identified in an Iwi Management Plan; and*
7. *Notwithstanding condition 6, where the discharge is from production blasting at a quarry site the discharge does not occur within 500m of a sensitive activity wāhi tapu, wāhi taonga or a place ofsignificance to Ngāi Tahu that is identified in an Iwi Management Plan.*

7.36 The discharge of contaminants into air from the outdoor storage of bulk solid materials is a permitted activity provided the following conditions are met:

1. *The discharge of dust does not cause an offensive or objectionable effect beyond the boundaryof the property of origin, when assessed in accordance with Schedule 2; and*
2. *The amount of material stored does not exceed 1000t when it has an average particle size of lessthan 3.5mm; and*
3. *Where the storage exceeds 200t, a dust management plan is prepared in accordance with Schedule2 and implemented by the person responsible for the discharge into air; and*
4. *The dust management plan is supplied to the CRC on request; and*
5. *The discharge does not occur within 100m of a sensitive activity, wāhi tapu, wāhi taonga or placeof significance to Ngāi Tahu that is identified in an Iwi Management Plan.*

Schedule 2: Assessment of offensive and objectionable effects

Criteria for assessing offensive or objectionable dust

The Canterbury Regional Council, for the purposes of assessing compliance with permitted activity conditions, resource consent conditions, or sections 17(3)(a), 314(1)(a)(ii) or 322(1)(a)(ii) of the RMA, and resource consent applicants carrying out assessments pursuant to this Schedule, will have regard to the following matters when determining whether or not a dust discharge has caused an objectionable or offensive effect:

1. *The frequency of dust events; and*
2. *The intensity of dust events, as indicated by dust quantity and the degree of effect; and*
3. *The duration of each dust event; and*
4. *The offensiveness of the discharge having regard to the nature of the dust, including soiling of materialsor structures and any potential health effects; and*
5. *The location of the dust, having regard to the sensitivity of the receiving environment, including takinginto account the relevant zone(s) and provisions in the relevant District Plan.*

Content of dust, odour and smoke management plans

"Management plans, for dust, smoke and odour must describe the practices and actions, or targets where required, that the person responsible for the discharge of contaminants into air will take to ensure that the overall effect of the frequency, intensity, duration, offensiveness and location of the discharge is not offensive or objectionable."
The level of detail required for the odour, smoke or dust management plan is relative to the scale of the discharge and the likelihood of the effect being offensive or objectionable.

The following is to be included in the Dust Management Plan:

1. *A description of the activity that will result in the discharge of contaminants into air; and*
2. *A description of how often the contaminants will be discharged - e.g. constant, daily, between 10amand 2pm on weekdays, only on windy days, once a month; and*
3. *A description of the intensity and character of the discharge - e.g. is the odour very pungent or light, is there likely to be a lot of dust or just a small amount and is it fine or course, is the smoke light or dark?; and*
4. *A description of the maximum duration of the effect of the discharge - e.g. What is the prevailing wind and how often will sensitive activities or neighbours be affected by the discharge? Will the effect occurduring times neighbours would be more or less effected?; and*
5. *A description of the offensiveness of the discharge - e.g. what are the characteristics of the odour? Is it an unpleasant odour such as sewage, or is it something that is often considered pleasant such as the smell of baking bread? Is the dust a particular colour that will make property appear dirty, or does it contain corrosive elements? Is the dust very fine? Is the smoke thick and acrid?; and*
6. *A description of the location of the discharge, including a description of the activities that occur on neighbouring properties and location of any sensitive activities that may be affected. A*

sketch plan should be prepared showing the location of the discharge and the location of sensitive receptors (such as dwellings, schools, meeting places, retail premises) and the separation distance between these receptors and the discharge; and

7. *An explanation as to how any adverse effects on sites that are sensitive to Ngāi Tahu, such as statutory acknowledgement areas, silent file areas or wāhi tapu or wāhi taonga are to be managed; and*[2]
8. *A description of the management practices being implemented to minimise the discharge or the effects of the discharge of contaminants - e.g. filters replaced regularly, equipment cleaned regularly, input types, limiting discharges to certain times or conditions (wind direction etc), effluent management system (design features, maintenance etc), filter types, design of stacks and vents, process features (stock numbers, feed type, type of detergent/ ink/ oil/chemical used), methods for dampening down dust, oiling roads, flocculent use, establishment of vegetation etc. Reference should be made to controls recommended in any relevant good practice guides for the activity.*

Schedule 4: Contaminants

The main air quality contaminants of interest in the Canterbury Region are discussed below.

PM_{10} can get deep within our lungs and cause wide ranging health and respiratory problems. The main source of PM10 in urban areas is home heating, but industry and transportation also emit PM_{10}. There is no safe level of PM_{10} exposure. Acceptable levels of PM_{10} have been set nationally by the NESAQ, based on the World Health Organisation Guideline for PM. This is a limit of fifty micrograms of PM per cubic metre (50µg/m3) averaged over a 24 hour period.[1] One exceedance of this standard is allowed each year and targets for compliance with this health-based standard are set for each polluted airshed.

$PM_{2.5}$ is a component of PM_{10} consisting of particles of 2.5 microns and smaller. Due to their smaller size they can get deeper within our lungs. $PM_{2.5}$ emission sources include home heating, transport and industry. There are no national guidance values for $PM_{2.5}$, but the World Health Organisation recommends a limit of 25 micrograms of $PM_{2.5}$ per cubic metre (25µg/m3) averaged over a 24 hour period.

It is likely the World Health Organisation guidance values for $PM_{2.5}$ are regularly exceeded in all of Canterbury's polluted airsheds. Monitoring shows these values are regularly exceeded in Christchurch and Timaru.