

Klondyke Water Storage Facility and Associated Activities - Dust Management Plan

Prepared for Hobec Lawyers on behalf of Rangitata Diversion Race Management Limited

Prepared by Beca Ltd (Beca)

5 July 2016

Final



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Document Acceptance

Action	Name	Signed	Date
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on behalf of	Beca Ltd		

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1 Purpose

1.1 Background

This Dust Management Plan (DMP) has been prepared by Beca Ltd (Beca) to support the application for resource consents by Rangitata Diversion Race Management Limited (RDRML) for the construction and operation of a water storage facility, white water course (WWC), fish screen and bypass and raising and widening of a reach of the canal embankment in Mayfield, Canterbury.

This DMP is specific to the construction and operation of the Klondyke water storage facility (hereafter referred to as the Pond), WWC, new fish screen and bypass and associated canal bank modifications which will involve earthworks, stockpiling of materials, concrete batching, screening and crushing of aggregates and the operation of diesel engines.

The DMP identifies the following:

- Key personnel responsible for implementing the DMP and their responsibilities
- Training and induction for staff and contractors
- The sources of air contaminants (primarily dust)
- A description of the site and the local environment
- Dust mitigation and prevention measures
- Monitoring methods
- Mechanisms for remediation of adverse effects (should this be required)
- Procedures for responding to complaints regarding dust and keeping records related to compliance.

RDRML has prepared a separate Smoke Management Plan (SMP), which details the management methods to be used to control smoke generated from the burning of vegetation on site. Consequently, this DMP does not include any methodology relating to the burning of vegetation.

The DMP is intended to be a working document and as such, information included is expected to be regularly reviewed and revised as construction activities occur. It is also expected that the DMP will need to be revised to incorporate any additional provisions that are required by the air discharge resource consent conditions. Any revisions will be forwarded to the Canterbury Regional Council (ECan) for review prior to implementation.

1.2 Objectives of the DMP

The objectives of this DMP are:

- To enable compliance with resource consent requirements regarding dust emissions and demonstrate this through reporting procedures.
- To promote liaison with neighbours and the local community, regarding dust management during construction.
- To provide the methods that may be employed to avoid, remedy or mitigate adverse effects of dust on the environment during construction and operation of the pond.

1.3 Resource Consent Conditions

The discharges to air resulting from the construction and operation of the site are subject to the conditions included in the resource consent granted by Environment Canterbury. The full text of the consent conditions is included in **Appendix A (to be added by the contractor)**.

2 Responsibilities

RDRML will be the holder of the consent for the discharges to air for the construction and operation of the Klondyke Pond and associated works and will have the ultimate responsibility to ensure that all statutory requirements and conditions of consent are complied with and works are carried out in accordance with the DMP.

2.1 Site Supervisor

The Site Supervisor will have day-to-day responsibility for the implementation of the DMP and will have the following attributes and experience;

- Be experienced in the management of large construction sites involving earthworks
- Be experienced in the control of dust from large construction sites involving earthworks
- Have a thorough knowledge and understanding of the requirements to manage the project in a manner that minimises any adverse effects on the environment and the nearby residents
- Have a thorough knowledge and understanding of the requirements to comply with the conditions of resource consents and the implications of non-compliance
- Be experienced in the training of personnel in the methods used to control dust from a large construction site.

The Site Supervisor will have the following responsibilities in respect of the management of dust:

- To ensure that all contractors and staff are properly trained and understand the requirements of the DMP
- To ensure that the conditions of the resource consent for discharges to air are complied with at all times
- To ensure that the dust control and mitigation measures and procedures outlined in the DMP are implemented effectively
- To ensure there are adequate personnel and equipment on site at all times to enable the dust control and mitigation measures outlined in the DMP to be implemented effectively, including in extreme weather events
- To ensure that the air quality monitoring programme is carried out as required
- To ensure that dust emissions are avoided and mitigated in accordance with the direction provided in the DMP
- To ensure that complaints are received, investigated and resolved as far as practicable, as outlined in the DMP
- To ensure the DMP is current and reviewed at least annually.

2.2 Contractors

All RDRML staff and contractors working on site are responsible for ensuring that their activities comply with the requirements of the DMP and the directions of the Site Supervisor.

3 Training and Induction

It is the responsibility of the Site Supervisor to implement an on-going training and induction programme for all contractors and staff. The purpose of this programme is to make all personnel working on site aware of and understand the purpose and requirements of the DMP and the air discharge resource consent conditions and the ramifications of a failure to comply with these requirements. The training programme for all contractors and staff will include at least the following aspects:

- The responsibilities of all staff and contractors for carrying out the work on site in a manner which does not result in adverse effects on the environment and local residents and in accordance with resource consent conditions
- The potential legal ramifications of adverse environmental effects occurring as a result of the project and non-compliance with resource consent conditions
- The minimum requirements for dust control for all activities on site including the following:
 - The operation of vehicles including speed control, minimising travel distances, covering of potentially dusty loads, removal of mud from wheels, the use of water on roads and yard areas
 - Loading and unloading materials including minimising drop heights, pre-watering of materials, carrying out operations on the leeward side of stockpiles
 - Minimising the area of open unstabilised ground, including staged removal of vegetation, progressive construction across the site, progressive consolidation of surfaces
 - Stockpiles of materials including the use of water, minimising the height of all stockpiles, restricting the height of stockpiles of dusty materials to no more than 3m
 - Crushing and screening of materials, including the use of water and minimising drop heights
 - Concrete batching plant including use and maintenance of dust filtration systems
- Information on the equipment and systems used to distribute water across the site for dust control, maintenance of the water distribution equipment, quantities of water to be used and frequency of application
- The requirements for staff to monitor weather and visually inspect the site for dust discharges, assess the adequacy of dust control methods and implement additional dust control methods when required
- The requirements of the instrumental monitoring programme, the data it provides and how it should be used
- The actions to be taken if dust and wind trigger levels are exceeded
- The actions to be taken in an extreme dust and weather event
- The actions to be taken if a complaint is received from the public or consent authority.

4 Activity and Site Description

4.1 Description of Activity

The Pond will be located in the vicinity of Mayfield in Canterbury and will store up to 53 million cubic metres (Mm³) of water collected from the Rangitata Diversion Race (RDR). Associated with the construction of the Pond, sections of the upstream banks of the Rangitata Diversion Race (RDR) will be increased in height by approximately one metre, a WWC will be constructed between the outlet of the Pond and the existing irrigation race, a 6ha ecological refuge will be constructed downstream of the sluice channel and a new fish screen and bypass will be installed downstream of the existing sand trap.

Construction of the Pond and associated works will involve earthworks, stockpiling of materials, concrete batching, screening and crushing of aggregates and the operation of diesel engines. All of these activities have the potential to generate discharges of dust. During operation of the Pond, the water levels will vary. Silt is expected to accumulate on the bottom and sides of the Pond, which will be exposed when water levels are low. The exposed silt may be a source of dust during dry, windy conditions.

4.2 Description of Site and Local Environment

4.2.1 Site description

The site is located predominantly to the north and west of the intersection of Ealing Montalto Road, Moorhouse Road, Shepherds Bush Road and Montalto Road. The Rangitata River flows in a north-south alignment to the west of the site and the Rangitata Diversion Race borders the northeastern boundary of the site.

The construction site covers an area of approximately 500ha and is located on a predominantly flat terrace above the Rangitata River. The site slopes gently towards the west and the river. There are mature evergreen shelterbelts along many of the fence lines and road boundaries within the site. A map showing the proposed layout of the site is included in **Appendix B**.

The bank raising works will extend from the sand trap, which is approximately 10km upstream of the canal inlet, to the Pond. The fish screen and bypass works will take place within and immediately downstream of the sand trap. The WWC and ecological refuge works will take place at the south-western corner of the Pond construction site.

4.2.2 Description of local environment

The surrounding land use is pastoral farming, predominantly dairy and sheep farming. Farm houses and farm buildings are scattered throughout the area along with numerous large shelter belts of trees.

The closest town to the site is Mayfield which is located approximately 11.5km to the east of the site. Geraldine is located approximately 26km to the southwest of the site.

Figure 4-1 shows the location of the construction site and the nearest residences to the Pond, which are most at risk of being adversely affected by dust. Figure 4-2 is an aerial photograph showing the location of Cumberland Dairy Farm, which is the closest house to the proposed canal bank raising and fish screen and bypass works.

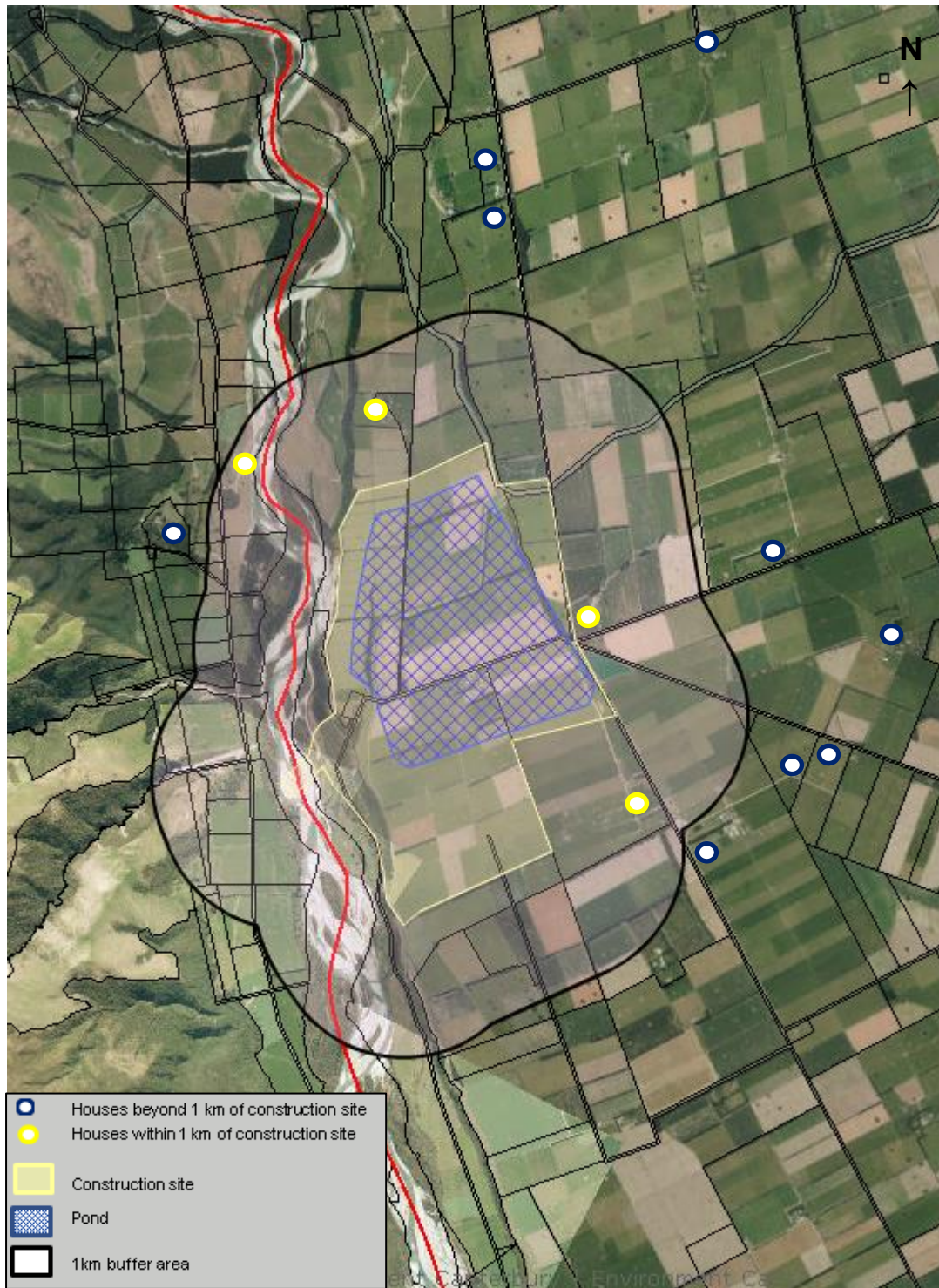


Figure 4-1 Aerial photograph showing the indicative locations of the site, nearby residences and a 1 km buffer area around the site (imagery sourced from ECan)

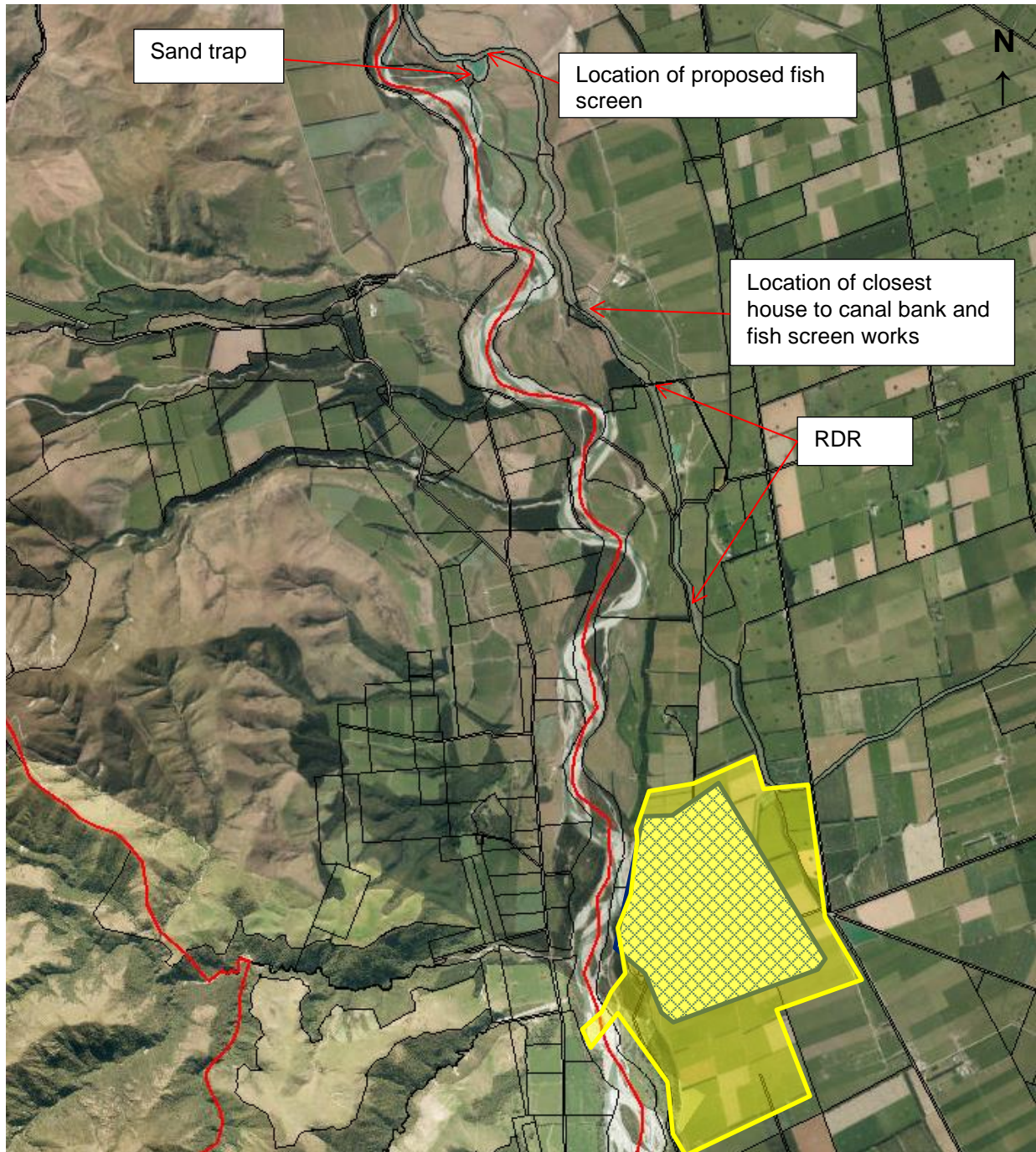


Figure 4-2 Aerial photograph showing the indicative locations of the closest house to the canal bank raising and fish screen and bypass works.

4.3 Site Weather Conditions

The predominant winds in the area come from the northwest quarter, with winds likely to be channelled down the Rangitata River Valley. The strongest winds are also likely to come predominantly from the northwest quarter. Winds which exceed a speed of 5m/s, the critical speed for pick-up of dust from unconsolidated surfaces, are relatively infrequent and wind speeds of greater than 10m/s occur rarely. Figure 4-3 shows a windrose for the Lismore climate station, which is the closest meteorological station to the site.

RDRML installed meteorological monitoring instruments on site in August 2015. At the time of preparing this document, there was insufficient data available from the RDRML monitoring site to provide an accurate representation of wind conditions at the site. However, once construction works begin sufficient data from the RDRML instruments will be available to be used for informing decisions regarding the suitability of the weather for carrying out potentially dusty activities.

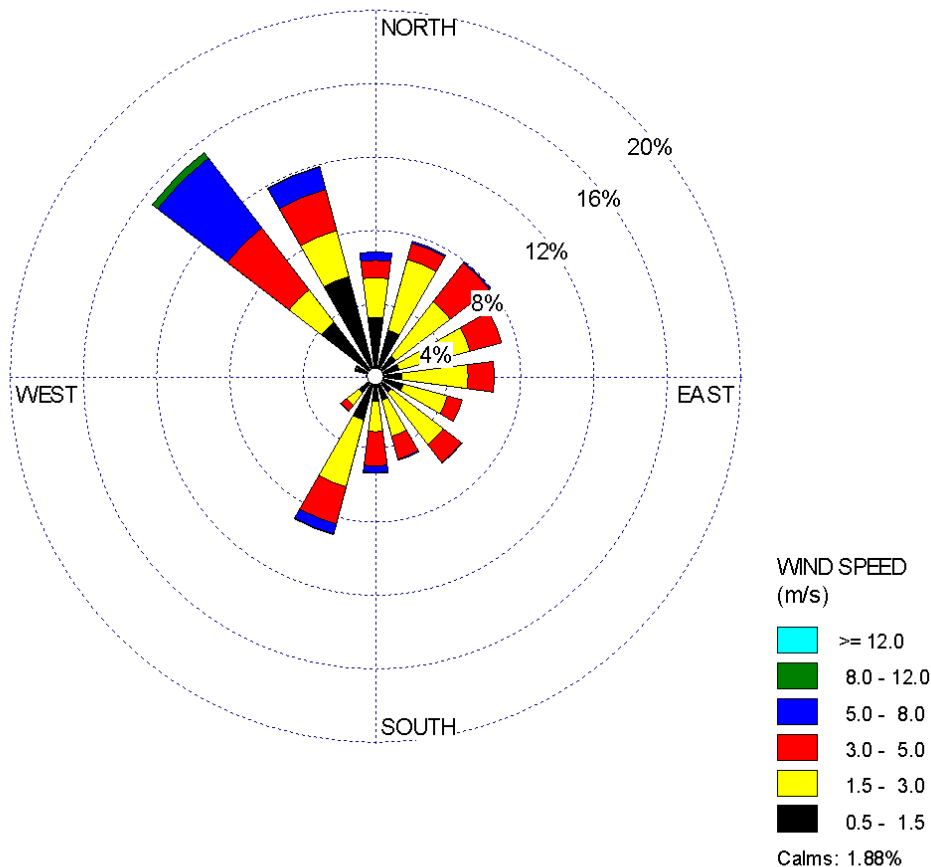


Figure 4-3 Windrose of hourly average wind speeds and direction measured at the Lismore climate station, October 2012 to December 2014 (data sourced from NIWA Cliflo database).

5 Dust Sources and Generation

5.1 Potential Dust Sources

The following activities will take place on site, which have the potential to generate discharges to air:

- Clearance of vegetation from the site
- Earthworks, including stripping and placement of soil and construction of embankments
- Stockpiling of soil and aggregates
- Crushing and screening of aggregates
- Concrete batching
- Transfer of bulk materials and vehicle movements
- Channel works including construction of diversion structures and canal bank improvements
- Rehabilitation of site
- Stationary and mobile diesel engines

Dust emissions from exposed surfaces generally increase with increasing wind speed. However, dust pick-up by wind is only significant at wind speeds above 5m/s. The smaller the particle size of the material on an exposed surface, the more easily the particles are able to be picked up and entrained in the wind. 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 larger the areas of exposed surfaces, the more potential there will be for dust emissions.

Vehicles travelling over exposed surfaces (i.e. haul roads) tend to pulverise any surface particles. Particles are lifted and dropped from rolling wheels and the surface. Dust is also sucked into the turbulent wake created behind moving vehicles.

The discharge of dust from the site has the potential to have effects on two scales. The first is individually from a source where the effects are localised in the immediate areas surrounding the activity. Secondly, cumulative effects may be observed where the dust generated from all of the nearby dust sources (such as machinery operating at the base of the pond and adjacent vehicle movements), combine to affect the air quality of the area as a whole. Therefore, it is important that all dust sources are minimised as far as practical, including those well-separated from sensitive locations, as all dust generated will have an effect on the overall air quality of the area.

5.2 Factors Influencing Dust Generation

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

- Wind speed across the surface
- The percentage of fine particles in the material on the surface
- Moisture content of the material
- The area of exposed surface
- Disturbances such as traffic, excavation, loading and unloading of materials and blasting.

Systems for controlling dust emissions need to include methods that modify the condition of the materials so that it has a reduced tendency to lift with the wind or disturbances such as vehicle movements, and methods that decrease the velocity of the wind at the surface.

Watering of exposed surfaces and materials that may be disturbed is a primary method of dust control. As a general guide, the typical water requirements for most parts of New Zealand are up to 1 litre per square

metre per hour¹ .

The dust prevention measures suggested in Section 5 have been found to be effective and can be used alone, or in combination depending on the circumstances. This list is not exhaustive and other methods may also be effective.

¹ Ministry for the Environment “*Good Practice Guide for Assessing and Managing the Environmental Effects of Dust*”

6 Mitigation Measures and Procedures

The following measures and procedures are to be implemented as necessary to control dust². The Site Supervisor has the responsibility to determine which methods are to be used, where and when.

6.1 Water Supply

The following water supply and distribution system will be maintained:

- Maintain a water supply and distribution system on site that is capable of delivering sufficient water to control dust over an area equivalent to at least one quarter of the site at a time. The Ministry for the Environment recommends that a water application rate of 1 litre/m²/hour may be required. Applying that volume of water to the site means that the system will need to be able to convey and distribute up to 10,000 litres per hectare per hour (10 cubic metres per hectare per hour) of water to the areas of the site that are “opened up” and require watering with sprinklers or water trucks.
- Water will be distributed over the areas of the site requiring dust control using a fleet of six water trucks and sprinklers.

6.2 Trigger Levels

Trigger values for wind speed and Total Suspended Particulate (TSP) concentrations will be used to assist in the determination of when additional dust control measures are required and when some activities on site must cease, in order to prevent adverse effects occurring beyond the boundary of the site. The trigger levels noted in Table 6-1 will need to be reviewed once consent has been granted to ensure consistency with consent conditions.

For the purposes of interpreting the Trigger Levels “potentially dusty activities” include;

- Stripping of potentially dusty materials such as topsoil and silt
- Formation of dam embankments using soil or silt
- Formation of soil and silt stockpiles
- Spreading of topsoil
- Movement or working of topsoil for the purpose of vegetating the embankments.

² Note methods for controlling the discharges to air from vegetation burning are included in the Smoke Management Plan.

Table 6-1 Trigger Levels for wind speed and TSP concentrations

Trigger Level	Values Measured at the On-Site Monitoring Station	Actions
TSP Alert	TSP concentration (1 hour average) >200 µg/m³ , or TSP concentration (24-hour average) > 80 µg/m³	Dust sources and dust control measures will be reviewed and additional dust control methods shall be implemented if necessary
TSP Alarm	TSP concentration (1 hour average) >220 µg/m³ TSP concentration (24-hour average) >100 µg/m³	All site operations will cease, except for dust control activities
Wind Speed Alert	Hourly average wind speeds > 5 m/s.	Dust sources and dust control measures will be reviewed and additional dust control methods shall be implemented if necessary
Wind Speed Alarm	<ul style="list-style-type: none"> Gust wind speeds (two minute average or less) > 10 m/s during two consecutive ten minute periods. Works may recommence when wind gusts (two minute average or less) <7.5 m/s during the previous two consecutive ten minute periods. 	Potentially dusty activities taking place within 500 m of downwind inhabited dwellings shall cease, except for dust control activities, until winds drop.

6.3 Earthworks

Dust mitigation measures will include:

- Carrying out earthworks in strips across the site, and therefore minimising the area of land that is being actively worked at any time
- Progressively constructing the embankments around the perimeter of the Pond
- Retaining existing vegetation for as long as practicable
- Pre-watering areas to be disturbed
- Using water as a dust suppressant to keep un-vegetated and unconsolidated surfaces damp using water trucks and sprinkler systems
- Avoiding undertaking potentially dusty activities (such as the stripping and spreading of topsoil and clay) on days when conditions are dry and winds are strong and blowing towards sensitive receptors
- Using temporary surface coverings such as mulch or gravel on unconsolidated surfaces that cannot be consolidated for several days
- Reducing haulage distances by balancing cut and fill operations as far as practicable.

6.4 Loading and Unloading of Bulk Materials

Dust mitigation measures will include:

- Minimising drop heights when loading and unloading vehicles
- Pre-watering materials to be transferred
- Undertaking loading and unloading operations on the leeward side of stockpiles where practicable.

6.5 Exposed Surfaces

Dust mitigation measures will include:

- Retaining existing vegetation for as long as practicable
- Minimising the area of exposed unconsolidated ground by staging of construction across the site
- Consolidating surfaces as soon as practicable and/or covering exposed surfaces with temporary coverings such as mulch or gravel
- Using water as a dust suppressant over all areas of the site that are at risk of creating dust, including stockpiles when necessary, using water trucks and sprinkler systems
- Minimising the height and slope of stockpiles to reduce wind pick up. Stockpiles of dusty materials should not exceed 3m in height
- Locating active stockpiles as far as practical from the eastern and southern boundaries of the site
- Vegetating stockpiles that will be undisturbed for more than three months.

6.6 Vehicle Movements and Roads

Dust mitigation measures will include:

- Limiting vehicle speeds on unpaved surfaces to no more than 20km/hr
- Minimising travel distances by balancing cut and fill operations
- Minimising vehicle traffic on unconsolidated surfaces as much as practicable
- Keeping access ways and unpaved roads damp using water trucks and sprinklers, or treating with alternative dust suppressant systems
- Regularly maintaining the site access roads by grading and the laying of coarse gravel
- Requiring vehicles entering and leaving the site that are carrying potential dusty loads to have their loads covered
- Providing a rumble grid and a sealed area of road prior to the site exits to minimise the track-out of mud to public roads on vehicle wheels
- Keeping paved roads and yard areas clean using either washing or vacuum sweepers.

6.7 Crushing and Screening of Aggregates

Dust mitigation measures will include:

- Fitting the crushing and screening plant with water sprays at all the principal dust sources such as the screens, crushers and conveyor transfer points to control the moisture content of materials
- Minimising drop heights from loading raw materials into the feed hopper and from stacking of stockpiles.

6.8 Concrete Batching Plant

Dust mitigation measures will include:

- Fitting fabric filters to the discharge of the cement silos and installing high pressure and level alarms to the cement silos to avoid overfilling
- Delivering cement to site in enclosed bulk tankers and pumping into the silos using compressed air
- Hard paving the yard areas around the batching plant and the access roads
- Bunkering or covering stockpiles of fine materials
- Regularly sweeping and washing the hard-paved areas around the plant and the access road to remove the build-up of deposited materials.

6.9 Extreme Events

In the event that air discharges are unable to be adequately controlled on the site due to extreme weather conditions and additional measures are required in order for RDRML to comply with the provisions of the resource consents, RDRML will maintain an up-to-date register of off-site contractors who have suitable equipment, such as water carts and irrigation systems and personnel available, that can be contacted to assist with controlling dust on site at short notice. The Emergency Contacts Register is included in **Appendix C**.

In the event of such extreme dust and weather events all work on site, except dust control will cease until conditions improve.

The Site Supervisor will have the responsibility to determine when to deploy the additional equipment and personnel and when it can be stood down.

6.10 Post-Construction Discharges

Dust mitigation will include using water to dampen exposed silt at the edges of the pond to control the formation of dust when required.

7 Monitoring

To ensure that measures are implemented and are effective in minimising dust discharges, an air quality monitoring plan will be implemented during the construction phase of the project. The monitoring programme will consist of observation and inspections by site personnel and instrumental monitoring.

7.1 Staff Monitoring

Table 7-1 outlines the air quality monitoring that is to be implemented and undertaken by site personnel during the construction of the Pond. The frequency of monitoring is defined but it must be noted that in the instance of strong winds, observations of dust moving off-site or a complaint, the monitoring should be undertaken more frequently at the discretion of the Site Supervisor.

Table 7-1: Air Quality Construction Monitoring Programme

Monitoring Activities	Frequency
Check weather forecasts for strong winds and rainfall	Daily
Inspect site exits and adjoining roads for the presence of soil deposits carried by vehicles	Twice daily
Observe weather conditions as measured by the on-site weather station	Daily and as conditions change
Visually inspect all exposed unstable surfaces for dampness and to ensure that exposure is minimised	Daily and as conditions change
Visually inspect stockpiles of potentially dusty materials to ensure dampness and stabilisation. Ensure stockpile heights are less than 3 m.	Daily and as conditions change
Visually inspect unpaved yard areas and roads to ensure surface is covered in coarse material and/or is damp.	Daily and as conditions change
Visually inspect hard-paved roads and yard areas to ensure soiling of the surface is minimised	Daily and as conditions change
Visually inspect dust generating activities to ensure dust emissions are effectively controlled	Daily and as new activities begin
Visually inspect all dust generating activities and review water application rates	Hourly in winds exceeding (5 m/s)
Inspect watering systems (water carts and sprinkler systems, including those on the crushing and screening plant) to ensure equipment is maintained and functioning effectively.	Weekly
Visually inspect the discharges to air from the cement batching plant to check filtration systems are operating effectively.	Twice daily when plant is operating
Visually inspect the crushing and screening plant to check that dust discharges are effectively controlled.	Twice daily when plant is operating

7.2 Instrumental Monitoring

Weather conditions and concentrations of Total Suspended Particulates (TSP) will be continuously

monitored at one location downwind of the construction site using real time instruments. The monitoring will be undertaken on behalf of RDRML by an instrumental air quality monitoring operator. The monitoring site will be reviewed as construction progresses but will generally be located near the boundary of the construction site, downwind of the site in the prevailing northwesterly winds and in the vicinity of the closest houses. The monitoring system will continuously measure the following parameters with the results available via the instrumental air quality monitoring operator's website.

- Temperature
- Rainfall
- Wind speed
- Wind direction
- Relative humidity
- Total Suspended Particulate (TSP) concentrations

The outputs of the instruments will be able to be monitored remotely at one or more locations and will be capable of producing an alarm when trigger values are approached. Alarms will be able to be seen, heard or will activate a pager or cell phone held by the Site Supervisor or his/her representative. The outputs from the instruments will be recorded.

7.3 Contingency Plans for Instrument Downtime

Instruments need to be shut down for maintenance and from time to time instruments may fail. During times when an instrument is not able to be operated, it is necessary for contingency plans to be implemented.

The instrumental air quality monitoring contractor will advise the Site Supervisor prior to shutting down an instrument for regular maintenance. Unplanned shutdowns can occur due to power failures and instrument faults. The instrumental air quality monitoring operator will alert the Site Supervisor and the Client of an instrument failure, either via an automatic alarm or by phone.

During the shutdown period, site personnel and contractors will take the following steps unless it is raining steadily or the wind speed is less than 5m/s:

- Turn on sprinklers on all potentially dusty surfaces (whether or not dust is being generated) and 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
- If no wind speed readings are available use the Beaufort Wind Scale to estimate wind speeds and if winds exceed a Force 2 wind (light breeze), the sprinklers and water carts should be activated (a copy of the Beaufort Wind Scale is attached in **Appendix D**).

8 Complaints

Complaints may be referred by one or more of the regulatory authorities, a member of the public or a RDRML employee or contractor. It is the responsibility of the Site Supervisor to respond to and follow up all complaints regarding dust. The Site Supervisor is responsible for ensuring suitably qualified personnel are available to respond to complaints at all times.

A Complaints Register will be prepared and kept up-to-date (**see Appendix E**)

8.1 Actions after a Complaint Received

The actions to be taken, as soon as possible after a complaint is received are:

- Fill out a complaint form.
- Note the time, date, identity and contact details of the complainant. Record wind direction and strength and weather conditions. Note if complaint has been referred from a consent authority. Ask complainant to describe the nature of the dust emission including;
 - is it constant or intermittent
 - how long it has been occurring
 - is it worse at any time of day
 - does it come from an identifiable source.
- As soon as possible after receipt of a complaint undertake a site inspection. Note all dust-producing activities taking place and the dust mitigation methods that are being used. If the complaint was related to an event in the recent past, note any dust-producing activities that were underway at that time if possible. Order any remedial action necessary as soon as possible.
- As soon as possible (preferably within 2 hours), visit the source of the complaint to ascertain if dust is still a problem.
- If it becomes apparent that there may be a source of dust other than the construction site causing the nuisance it is important to verify this. Photograph the source and emissions if possible.
- As soon as possible after the initial investigations have been completed contact the complainant to explain any problems found and remedial actions taken.
- If necessary update any relevant procedures to prevent any recurrence of the problem.
- Complete complaint form and file on Complaints Register.

8.2 Follow-up Actions

- Advise the Site Supervisor and the Canterbury Regional Council (Environment Canterbury) as soon as practical that a complaint has been received, what the findings of the investigation were and any remedial actions taken.
- Advise staff and contractors that a complaint has been received and what the findings of the investigation were and any remedial actions taken.

9 Consultation

9.1 Neighbours

RDRML will advise the community of the contact phone numbers to be used to lodge any complaints regarding air emissions from the site. This advice may include one or all of the following:

- Signs on site
- Letters
- Email
- Phone calls.

The contact phone numbers and email addresses to be used for registering a complaint are included in **Appendix C**.

9.2 Regional and District Councils

RDRML will develop, maintain and implement a reporting regime with Environment Canterbury and the Ashburton District Council to inform them of any issues regarding air discharge control at the site that may be of interest to them and to obtain feedback on compliance and performance.

RDRML will provide Environment Canterbury and the Ashburton District Council with contact numbers and will advise both consent authorities of all dust complaints that are received.

10 Reporting

10.1 RDRML to Contractors/Staff

RDRML shall report any complaints received regarding air discharges and the remedial actions taken to all contractors and staff.

10.2 RDRML to Regulatory Authorities

RDRML will provide Environment Canterbury and Ashburton District Council with the following advice;

- Any complaints received regarding air discharges as soon as practical after receipt of the complaint but no later than three days
- Any non-compliances with conditions of consent for discharges to air
- A revised copy of the DMP if any revisions of the document are made.

11 DMP Review Procedure

The DMP shall be reviewed at least annually and when any changes are made to the dust control methods and procedures used on site.

Appendix A

Consent Conditions

Appendix B

Site Layout



Appendix C

Contacts List

Contact List

[illegible]

Appendix D

Beaufort Wind Scale

Beaufort number	Description	Wind speed	Wave height	Sea conditions	Land conditions
0	Calm	< 1.1 km/h	0 m	Flat.	Calm. Smoke rises vertically.
		< 0.7 mph			
		< 0.6 knot	0 ft		
		< 0.3 m/s			
1	Light air	1.1–5.5 km/h	0–0.2 m	Ripples without crests.	Smoke drift indicates wind direction. Leaves and wind vanes are stationary.
		0.7–3.4 mph	0–1 ft		
		0.6–3 knot			
		0.3–1.5 m/s			
2	Light breeze	5.5–11.9 km/h	0.2–0.5 m	Small wavelets. Crests of glassy appearance, not breaking	Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.
		3.4–7.4 mph	1–2 ft		
		3–6.4 knot			
		1.5–3.3 m/s			
3	Gentle breeze	11.9–19.7 km/h	0.5–1 m	Large wavelets. Crests begin to break; scattered whitecaps	Leaves and small twigs constantly moving. light flags extended.
		7.4–12.2 mph	2–3.5 ft		
		6.4–10.6 knot			
		3.3–5.5 m/s			
4	Moderate breeze	19.7–28.7 km/h	1–2 m	Small waves with breaking crests. Fairly frequent whitecaps.	Dust and loose paper raised. Small branches begin to move.
		12.2–17.9 mph	3.5–6 ft		
		10.6–15.5 knot			
		5.5–8 m/s			
5	Fresh breeze	28.7–38.8 km/h	2–3 m	Moderate waves of some length. Many whitecaps. Small amounts of spray.	Branches of a moderate size move. Small trees in leaf begin to sway.
		17.9–24.1 mph	6–9 ft		
		15.5–21 knot			
		8–10.8 m/s			
6	Strong breeze	38.8–49.9 km/h	3–4 m	Long waves begin to form. White foam crests are very frequent. Some airborne spray is present.	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic bins tip over.
		24.1–31 mph	9–13 ft		
		21–26.9 knot			
		10.8–13.9 m/s			
7	High wind, moderate gale, near gale	49.9–61.8 km/h	4–5.5 m	Sea heaps up. Some foam from breaking waves is blown into streaks along wind direction. Moderate amounts of airborne spray.	Whole trees in motion. Effort needed to walk against the wind.
		31–38.4 mph	13–19 ft		
		26.9–33.4 knot			
		13.9–17.2 m/s			

8	Gale, fresh gale	61.8–74.6 km/h	5.5–7.5 m	Moderately high waves with breaking crests forming spindrift. Well-marked streaks of foam are blown along wind direction. Considerable airborne spray.	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.
		38.4–46.3 mph			
		33.4–40.3 knot	18–25 ft		
		17.2–20.7 m/s			
9	Strong/severe gale	74.6–88.1 km/h	7–10 m	High waves whose crests sometimes roll over. Dense foam is blown along wind direction. Large amounts of airborne spray may begin to reduce visibility.	Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over.
		46.3–54.8 mph			
		40.3–47.6 knot	23–32 ft		
		20.7–24.5 m/s			
10	Storm, ^[7] whole gale	88.1–102.4 km/h	9–12.5 m	Very high waves with overhanging crests. Large patches of foam from wave crests give the sea a white appearance. Considerable tumbling of waves with heavy impact. Large amounts of airborne spray reduce visibility.	Trees are broken off or uprooted, structural damage likely.
		54.8–63.6 mph			
		47.6–55.3 knot	29–41 ft		
		24.5–28.4 m/s			
11	Violent storm	102.4–117.4 km/h	11.5–16 m	Exceptionally high waves. Very large patches of foam, driven before the wind, cover much of the sea surface. Very large amounts of airborne spray severely reduce visibility.	Widespread vegetation and structural damage likely.
		63.6–72.9 mph			
		55.3–63.4 knot	37–52 ft		
		28.4–32.6 m/s			
12	Hurricane force ^[7]	≥ 117.4 km/h	≥ 14 m	Huge waves. Sea is completely white with foam and spray. Air is filled with driving spray, greatly reducing visibility.	Severe widespread damage to vegetation and structures. Debris and unsecured objects are hurled about.
		≥ 72.9 mph			
		≥ 63.4 knot	≥ 46 ft		
		≥ 32.6 m/s			

Appendix E

Complaints Register